United States
Department of
Agriculture

Natural Resources
Conservation
Service

In cooperation
with Texas
AgriLife
Research

Soil Survey of Goliad County, 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.

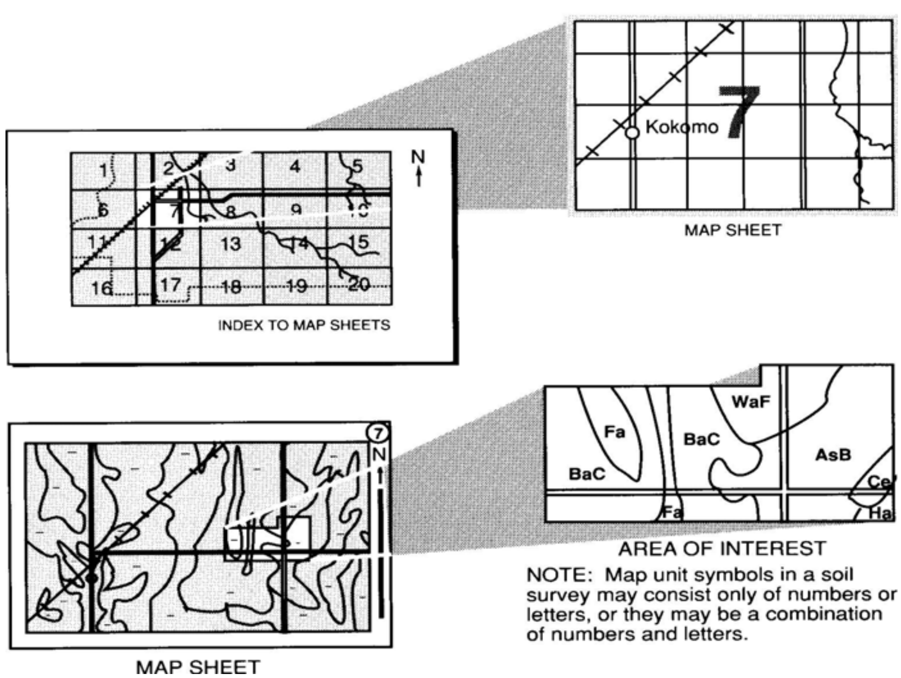
Detailed Soil Maps

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**. Note the number of the map sheet and go 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 2008. Soil names and descriptions were approved in 2009. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2008. This survey was made cooperatively by the Natural Resources Conservation Service, and the Texas AgriLife Research. The survey is part of the technical assistance furnished to the Goliad County Soil and Water Conservation District.

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

Cover: Images of Goliad County, Texas.

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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Issued 2010

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

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 for use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

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

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Soil Survey of Goliad County, Texas

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United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with Texas AgriLife Research

Goliad County is in the south central part of Texas (fig.1). It is bound on the west by Karnes County, on the north and northwest it borders DeWitt County. Victoria County is to the east; Refugio County is to the southeast, and Bee County is to the southwest. It has a total of 860 square miles or 549,536 acres. The city of Goliad is the county seat. Other towns include Ander, Berclair, Charco, Fannin, and Schroeder. The county population as of the 2000 U.S. census was 6,928.

The land surface is gently sloping from the northwest to the southeast and follows the major drainage systems of the county. The San Antonio River and its tributaries drain the largest area of the county. This system generally runs from west to east through the center of the county. Coleto Creek on the east and Blanco Creek on the south sides of the county are the other major drainage systems.

Goliad County is in two major land resource areas (MLRA's). About two-thirds of the county lies within the Northern Rio Grande Plain MLRA and about one-third is in the Gulf Coast Prairies MLRA. The Northern Rio Grande Plain MLRA is north of a line that roughly runs northeast from Schroeder to Berclair in the southwest. The Gulf Coast Prairies MLRA is south of that line. The Northern Rio Grande Plain is characterized by low rolling hills interspersed with drainageways. The Gulf Coast Prairies MLRA is nearly level.

The major land use in Goliad County is rangeland. About 95 percent is used as rangeland and wildlife habitat. Cropland makes up about 2 percent. Pastureland makes up about 3 percent.

General Nature of the Survey Area

This section provides general information concerning the history and settlement and climate of the Goliad County survey area.

History and Settlement

Goliad County, established in 1836, is one of the oldest counties in Texas. The county has played an important role in Texas history.

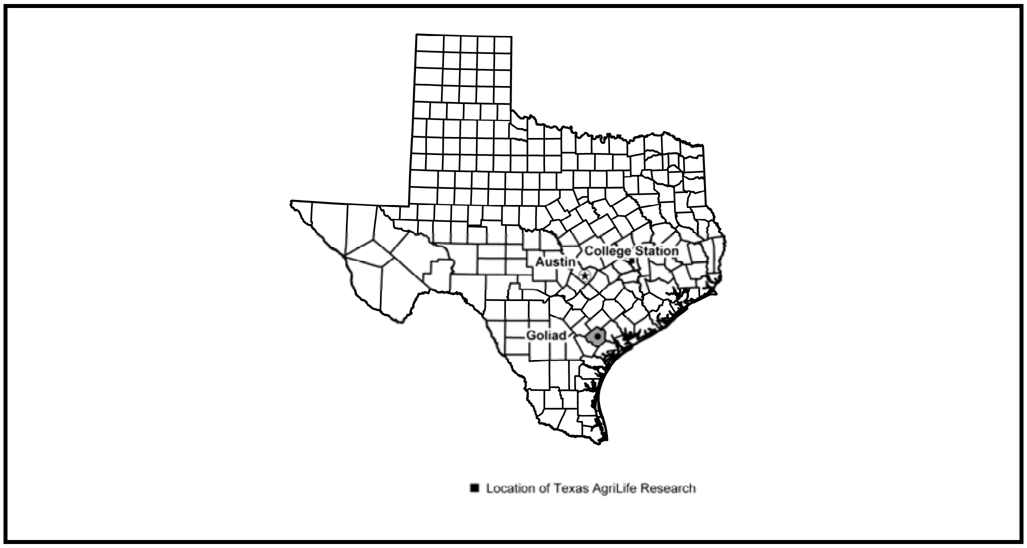

Figure 1.—Location of Goliad County, Texas

Artifacts in the form of arrowheads, scrapers, and spearpoints indicate that Goliad County was inhabited by Indians prior to European contact. The Aranamas, Karankawas, Tonkawas, and Tamiques were the probable Indian groups that lived in Goliad County during this period. The Comanches and Lipan Apaches were known to frequent the area as late as the early 19th century. The first European contact could have been as early as the 1500s when Spanish explorers were known to have been in the area on expeditions. The first European settlement was established in 1749 when Nuestra Senora de Loreto Presidio and Nuestra Senora del Espiritu Santo de Zuniga Missions were moved from the Victoria area to a site along the San Antonio River. The presidio (fig. 2) was used to protect Spanish holdings from being taken by the French and English. The mission and presidio continued to be a focal point for activity in the years to come.

By 1821, Mexico had earned its independence from Spain. The Mexican government sponsored the immigration of people loyal to Mexico into the Goliad area as a strategy to hold off United States expansionism. This increase in population helped pave the way for the Mexican government to elevate the status of the area surrounding the presidio to the level of being a jurisdictional city. The city was then named to Goliad, which is an anagram of the Mexican Revolutionary hero Hidalgo. By 1835, political differences between the colonists of Texas to include Goliad and the Mexican government under Antonio Lopez de Santa Ana came to a head.

The Goliad garrison occupied by Mexican forces at the time was captured by Anglo-Texans. In 1836, the Mexican Army retook the garrison as a result of the defeat of Col. Fannin at the battle of Coleto. A memorial to that battle can be found in a park just south of the town of Fannin (fig. 3). In retribution, the Texans were executed by the Mexican officials for their actions against Mexico. These actions helped spark the Texas Revolution.

When Texas won its independence in 1836, Goliad was recognized as one of the first counties to be formed by the newly formed Republic of Texas government. Goliad saw growth from Germany and other European countries during the mid 1800s as it was on a main route from the port at Indianola to San Antonio. The towns of Schroeder, Weesatche and Weser saw much of its establishment and growth during this time. By the 1860's, the current Goliad County boundaries for the most part had been set by the Texas legislature.

Figure 2.—The Presidio La Bahia, provided protection for the Spanish against invaders. This site is located south of Goliad above the San Antonio River. The Presidio is located on an area of Sarnosa fine sandy loam, 1 to 5 percent slopes.

During the Civil War, Goliad County was on a major smuggling route from Mexico to the Confederacy to bypass Union blockades. Cotton and other necessities were transported on this route. Following the war and reconstruction, Goliad continued to grow and prosper. The 1880 census showed Goliad County having a population of 5,832 people. Corn and cotton were the major crops and the number of cattle numbered about 47,000 head.

The railroad came to Goliad County by the late 1880s, with a line built from Victoria to Beeville. This line ushered in a new wave of growth with the establishment of the towns of Fannin and Berclair on each end of the county along the railroad.

Goliad County hit its highest population mark during the 1930s at a little over 10,000 people. Since the 1930s, the population fell with the lowest level hitting 4,869 residents in 1970. The population has slowly increased since that time and today's growth is centered on people that commute to nearby Victoria.

Today, Goliad's historical features attract visitors from all over Texas and the nation.

Climate

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

There is not a weather station located in Goliad County, so the weather data from Beeville (southwest of Goliad) and Victoria WSO (east of Goliad) were used to provide the climate data.

Climate tables are created from climate station Beeville 5 NE Texas.

Figure 3.—Memorial to the Battle of Coleto Creek and Goliad massacre, located south of Fannin. This monument and associated State Park are located on an area of Wyick fine sandy loam, 0 to 1 percent slopes.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Victoria, Texas.

Table 1 provides data on temperature and precipitation for the survey area as recorded at Beeville 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 at Beeville on December 25, 1983, is 8 degrees. In summer, the average temperature is 83 degrees and the average daily maximum temperature is 94 degrees. The highest temperature, which occurred at Beeville on July 9, 1939, is 111 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 33 inches. Of this, about 29 inches, or 88 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 0.61 inch at Beeville on September 22, 1967. Thunderstorms occur on about 56 days each year, and most occur in August.

The average relative humidity in mid-afternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 91 percent. The sun shines 75 percent of the time in summer and 48 percent in winter. The prevailing wind is from the south. Average wind speed is highest, 11 miles per hour, in April.

Climate tables are created from climate station Victoria WSO Texas.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Victoria, Texas.

Table 4 provides data on temperature and precipitation for the survey area as recorded at Victoria in the period 1971 to 2000. Table 5 shows probable dates of the first freeze in fall and the last freeze in spring. Table 6 provides data on the length of the growing season.

In winter, the average temperature is 56 degrees F and the average daily minimum temperature is 45 degrees. The lowest temperature on record, which occurred at Victoria on December 23, 1989, is 9 degrees. In summer, the average temperature is 84 degrees and the average daily maximum temperature is 93 degrees. The highest temperature, which occurred at Victoria on September 5, 2000, is 111 degrees.

Growing degree days are shown in Table 4. 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 40 inches. Of this, about 35 inches, or 88 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 10 inches at Victoria on April 5, 1991. Thunderstorms occur on about 56 days each year, and most occur in August.

The average relative humidity in mid-afternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 91 percent. The sun shines 75 percent of the time in summer and 48 percent in winter. The prevailing wind is from the south. Average wind speed is highest, 11 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; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils 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 are 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, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. 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 on the intensity of mapping or in the extent of the soils in the survey area.

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—Weesatche-Ander-Clareville

Setting

General location: Predominantly located from the southwest to northcentral part of the area.
Major land resource area: MLRA 83A—Northern Rio Grande Plain
Landscape: Inland, dissected coastal plain
Elevation: 25 to 400 feet (8 to 122 meters)
Mean annual precipitation: 23 to 36 inches (584 to 918 millimeters)
Mean annual air temperature: 70 to 73 degrees F (21 to 23 degrees C)
Frost-free period: 248 to 305 days

Composition

Weesatche and similar soils: 40 percent
Ander and similar soils: 20 percent
Clareville and similar soils: 15 percent
Contrasting soils: 25 percent

Soil Description

Position(s) on landform(s): Weesatche—Interfluve backslope on paleoterrace; Ander—Interfluve toeslope on low hill; Clareville—Base slope on draw (fig. 4)
Parent material: Weesatche—calcareous loamy residuum weathered from sandstone; Ander—loamy alluvium; Clareville—loamy alluvium

Typical Profile

Weesatche

A—0 to 5 inches; slightly alkaline sandy clay loam
Bt—5 to 28 inches; slightly alkaline sandy clay loam
Bk—28 to 80 inches; moderately alkaline sandy clay loam

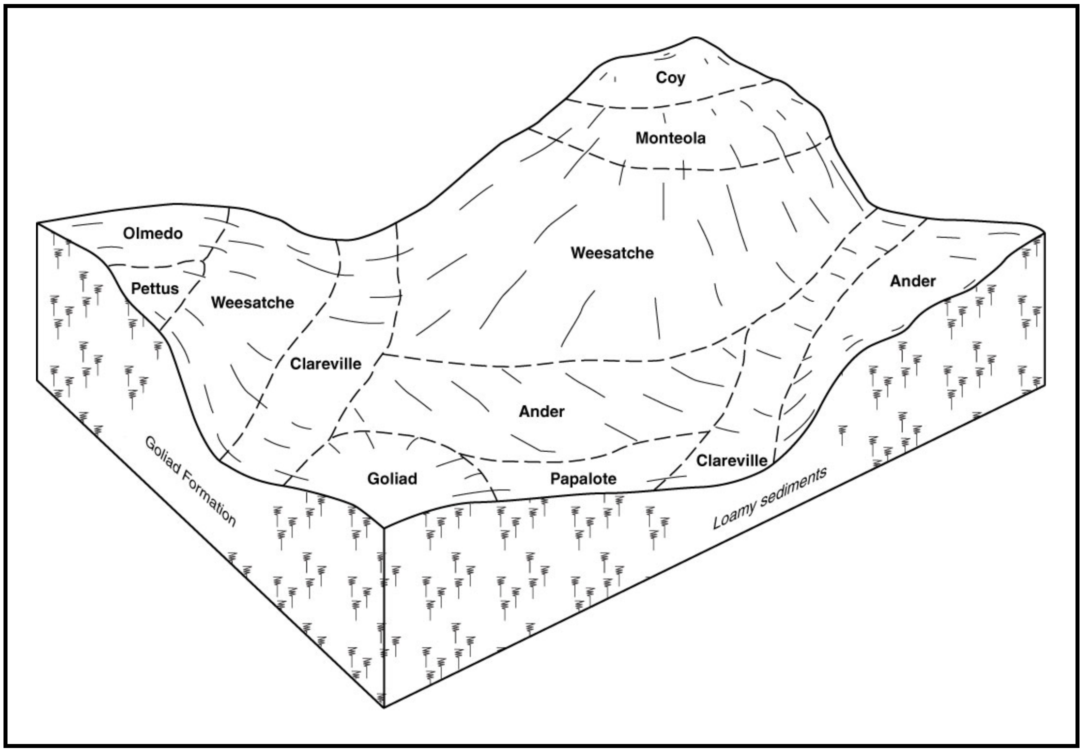

Figure 4.—Pattern of soils and underlying material in the Weesatche-Ander-Clareville general soil map units.

Ander

A—0 to 12 inches; slightly acid fine sandy loam
Bt1—12 to 17 inches; slightly alkaline sandy clay
Bt2—17 to 38 inches; slightly alkaline sandy clay loam
Bk—38 to 80 inches; moderately alkaline sandy clay loam

Clareville

A—0 to 9 inches; neutral sandy clay loam
Bt—9 to 38 inches; neutral clay
Bk—38 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: Weesatche—1 to 3 percent; Ander—1 to 3 percent; Clareville—0 to 1 percent
Depth to first restrictive layer: Weesatche—Not present; Ander—Abrupt textural change: 11 inches; Clareville—Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: Weesatche—0.6 to 2.0 in/hr (Moderate); Ander—0.06 to 0.2 in/hr (Slow); Clareville—0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: Weesatche—About 9.0 inches (High); Ander—About 8.9 inches (Moderate); Clareville—About 10.6 inches (High)

Natural drainage class: Weesatche—Well drained; Ander—Moderately well drained; Clareville—Well drained
Runoff: Weesatche—Low; Ander—High; Clareville—Negligible
Flooding frequency: Weesatche and Ander—None; Clareville—Rare
Ponding frequency: None

Interpretive Groups

Land capability nonirrigated: Weesatche—2e; Ander—2e; Clareville—2e
Ecological site name and site number: Weesatche—Clay Loam 25-35" PZ (R083AY629TX); Ander—Tight Sandy Loam 21-35" PZ (R083AY412TX); Clareville—Clay Loam 25-35" PZ (R083AY629TX)
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

2—Papalote-Weesatche

Setting

General location: Predominantly located from the southwest to northcentral part of the area.
Major land resource area: MLRA 83A—Northern Rio Grande Plain
Landscape: Inland, dissected coastal plain
Elevation: 95 to 495 feet (30 to 152 meters)
Mean annual precipitation: 26 to 36 inches (652 to 918 millimeters)
Mean annual air temperature: 70 to 73 degrees F (21 to 23 degrees C)
Frost-free period: 270 to 305 days

Composition

Papalote and similar soils: 60 percent
Weesatche and similar soils: 30 percent
Contrasting soils: 10 percent

Soil Description

Position(s) on landform(s): Papalote—Tread footslope on high stream terrace; Weesatche—Interfluve backslope on paleoterrace (fig. 5)
Parent material: Papalote—loamy alluvium; Weesatche—calcareous loamy residuum weathered from sandstone

Typical Profile

Papalote

A—0 to 9 inches; neutral loamy sand
Bt1—9 to 28 inches; slightly acid sandy clay
Bt2—28 to 36 inches; slightly alkaline sandy clay loam
Btk—36 to 80 inches; moderately alkaline loam

Weesatche

A—0 to 5 inches; slightly alkaline sandy clay loam
Bt—5 to 28 inches; slightly alkaline sandy clay loam
Bk—28 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: Papalote—0 to 3 percent; Weesatche—1 to 3 percent

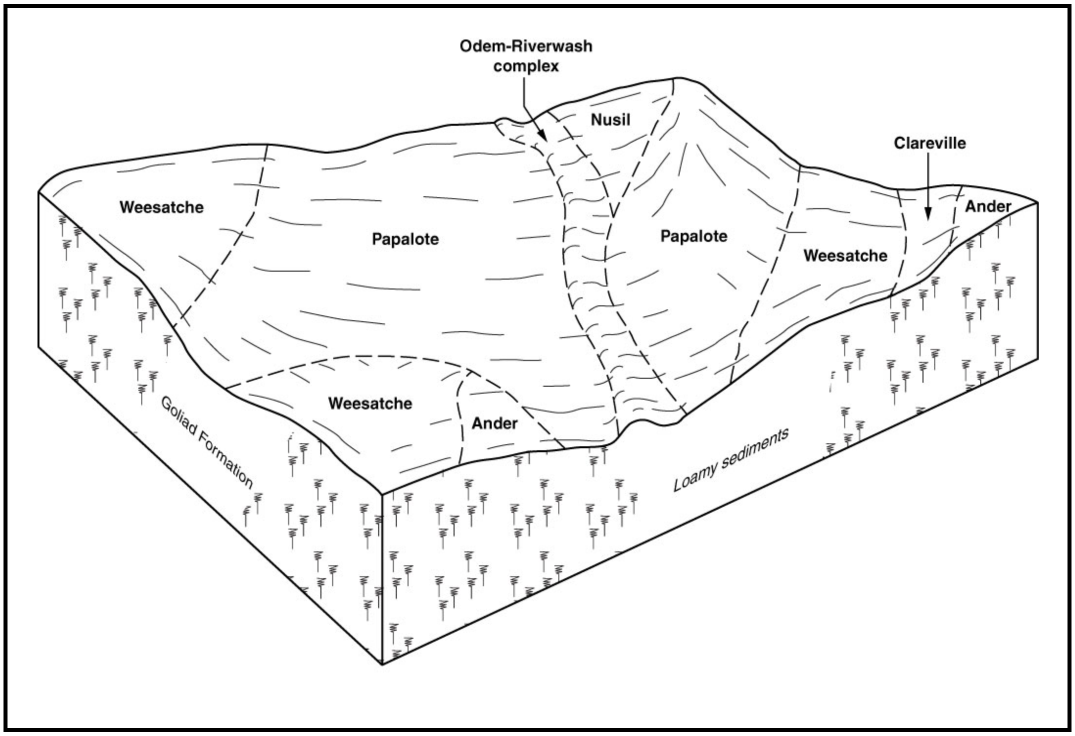

Figure 5.—Pattern of soils and underlying material in the Papalote-Weesatche general soil map units.

Depth to first restrictive layer: Papalote—Abrupt textural change: 9 inches; Weesatche—Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: Papalote—0.06 to 0.2 in/hr (Slow); Weesatche—0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: Papalote—About 8.7 inches (Moderate); Weesatche—About 9.0 inches (High)
Natural drainage class: Papalote—Moderately well drained; Weesatche—Well drained
Runoff: Papalote—Low; Weesatche—Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: Papalote—3e; Weesatche—2e
Ecological site name and site number: Papalote—Loamy Sand 25-35" PZ (R083AY396TX); Weesatche—Clay Loam 25-35" PZ (R083AY629TX)
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

3—Wyick-Sarco-Vidauri

Setting

General location: Predominantly in the southern and southeastern part of the area.
Major land resource area: Sarco—MLRA 87A—Texas Claypan, Southern Part; Wyick and Vidauri—MLRA 150A—Gulf Coast Prairies
Landscape: Inland, dissected coastal plain
Elevation: 30 to 200 feet (9 to 61 meters)
Mean annual precipitation: 26 to 36 inches (652 to 918 millimeters)
Mean annual air temperature: 70 to 73 degrees F (21 to 23 degrees C)
Frost-free period: 248 to 310 days

Composition

Wyick and similar soils: 35 percent
Sarco and similar soils: 30 percent
Vidauri and similar soils: 20 percent
Contrasting soils: 15 percent

Soil Description

Position(s) on landform(s): Wyick—Talf on flat; Sarco—Rise on wooded stream terrace; Vidauri—Dip on weakly, defined drainageway (fig. 6)
Parent material: Wyick and Vidauri—loamy fluviomarine deposits; Sarco—loamy alluvium

Typical Profile

Wyick

A—0 to 6 inches; moderately acid fine sandy loam
Bt1—6 to 12 inches; strongly acid sandy clay
Bt2—12 to 30 inches; neutral sandy clay loam
Btk—30 to 80 inches; moderately alkaline sandy clay loam

Sarco

A—0 to 5 inches; slightly acid coarse sand
E—5 to 12 inches; slightly acid coarse sand
Bt1—12 to 20 inches; strongly acid sandy clay loam
Bt2—20 to 32 inches; strongly acid sandy clay loam
Btk—32 to 80 inches; moderately alkaline sandy clay loam

Vidauri

A—0 to 4 inches; moderately acid fine sandy loam
Bt—4 to 41 inches; slightly acid sandy clay loam
Btk—41 to 49 inches; moderately alkaline sandy clay loam
Btkn—49 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: Wyick—0 to 1 percent; Sarco—0 to 2 percent; Vidauri—0 to 1 percent
Depth to first restrictive layer: Wyick—Abrupt textural change: 6 inches; Sarco—Abrupt textural change: 11 inches; Vidauri—Abrupt textural change: 12 inches
Slowest soil permeability to 60 inches, above first cemented restrictive layer: Wyick—0.001 to 0.06 in/hr (Very slow); Sarco—0.06 to 0.2 in/hr (Slow); Vidauri—0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Wyick—Sodic; Sarco and Vidauri—Not sodic
Sodicity, maximum within 40 inches: Wyick and Sarco—Sodic; Vidauri—Not sodic
Representative total available water capacity to 60 inches: Wyick—About 7.0 inches (Moderate); Sarco—About 8.3 inches (Moderate); Vidauri—About 7.6 inches (Moderate)
Natural drainage class: Wyick and Sarco—Moderately well drained; Vidauri—Somewhat poorly drained
Runoff: Wyick—High; Sarco—Medium; Vidauri—Negligible
Flooding frequency: None
Ponding frequency: Wyick and Sarco—None; Vidauri—Occasional
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: Wyick—3w; Sarco—3e; Vidauri—4w
Ecological site name and site number: Wyick and Vidauri—Claypan Prairie 28-44" PZ (R150AY528TX); Sarco—Claypan Savannah 28-40" PZ (R087AY221TX)
Typical vegetation: Wyick—bluestem, paspalums, other upland forbs and shrubs; Sarco—Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn; Vidauri—bluestem, paspalums, panicum, rushes, and sedges.

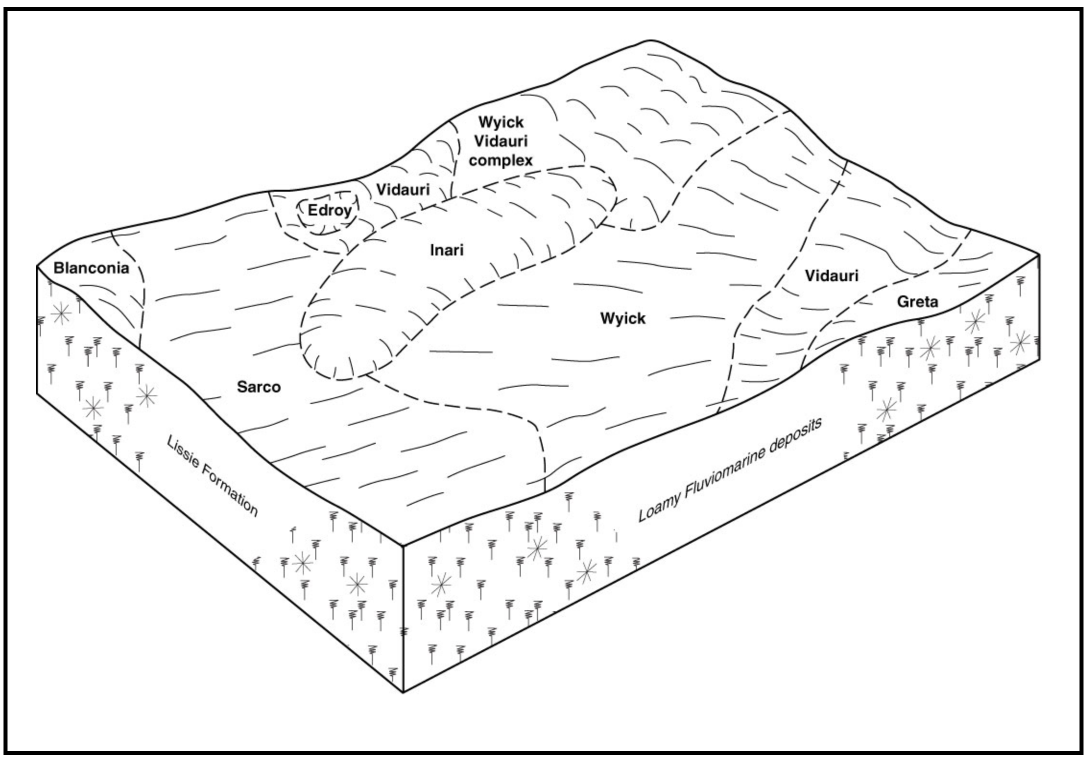

Figure 6.—Pattern of soils and underlying material in the Wyick-Sarco-Vidauri general soil map units.

4—Telferner-Laewest-Edna

Setting

General location: Southeastern part of the area on the coastal plains over the Beaumont Formation.
Major land resource area: MLRA 150A—Gulf Coast Prairies
Landscape: Flat coastal plain
Elevation: 10 to 151 feet (3 to 46 meters)
Mean annual precipitation: 30 to 55 inches (762 to 1,397 millimeters)
Mean annual air temperature: 68 to 73 degrees F (20 to 23 degrees C)
Frost-free period: 250 to 300 days

Composition

Telferner and similar soils: 45 percent
Laewest and similar soils: 30 percent
Edna and similar soils: 20 percent
Contrasting soils: 5 percent

Soil Description

Position(s) on landform(s): Telferner—Rise on ancient meander scroll; Laewest—Gilgai on talf on flat; Edna—Talf on flat (fig. 7)
Parent material: Telferner and Edna—loamy fluviomarine deposits of Late Pleistocene age; Laewest—clayey fluviomarine deposits of Late Pleistocene age

Typical Profile

Telferner

A—0 to 9 inches; slightly acid fine sandy loam
Bt—9 to 29 inches; neutral sandy clay
Btk—29 to 80 inches; moderately alkaline sandy clay loam

Laewest

A—0 to 6 inches; slightly acid clay
Bss—6 to 40 inches; slightly acid clay
Bkss—40 to 62 inches; slightly alkaline clay
BCk—62 to 80 inches; moderately alkaline clay loam

Edna

A—0 to 9 inches; slightly acid fine sandy loam
Bt1—9 to 30 inches; slightly acid clay
Bt2—30 to 50 inches; slightly alkaline clay loam
Btk—50 to 80 inches; slightly alkaline sandy clay loam

Properties and Qualities

Slope: Telferner—0 to 1 percent; Laewest—0 to 1 percent; Edna—0 to 1 percent
Depth to first restrictive layer: Telferner—Not present; Laewest—Not present; Edna—Abrupt textural change: 9 inches
Slowest soil permeability to 60 inches, above first cemented restrictive layer: Telferner—0.001 to 0.06 in/hr (Very slow); Laewest—0.001 to 0.06 in/hr (Very slow); Edna—0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic

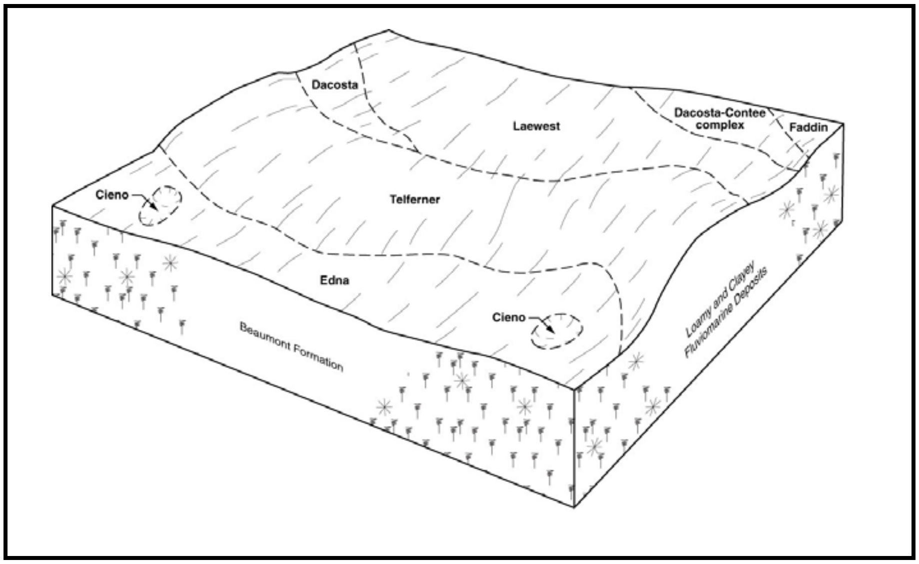

Figure 7.—Pattern of soils and underlying material in the Telferner-Laewest-Edna general soil map units.

Sodicity, maximum within 40 inches: Telferner and Edna—Not sodic; Laewest—Sodic
Representative total available water capacity to 60 inches: Telferner—About 8.5 inches (Moderate); Laewest—About 10.8 inches (High); Edna—About 8.8 inches (Moderate)
Natural drainage class: Telferner and Laewest—Moderately well drained; Edna—Somewhat poorly drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Telferner and Edna—Present within 80 inches; Laewest—Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: Telferner—2w; Laewest—2s; Edna—3w
Ecological site name and site number: Telferner—Loamy Prairie 44-56" PZ (R150AY741TX); Laewest—Blackland 24-44" PZ (R150AY526TX); Edna—Claypan Prairie 28-44" PZ (R150AY646TX)
Typical vegetation: Telferner and Edna—Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn; Laewest—bluestem, paspalums, and other upland forbs and shrubs.

5—Monteola-Clareville-Pernitas

Setting

General location: Predominantly located from the southwest to northcentral part of the area.
Major land resource area: MLRA 83A—Northern Rio Grande Plain
Landscape: Inland, dissected coastal plain
Elevation: 25 to 801 feet (8 to 244 meters)
Mean annual precipitation: 23 to 36 inches (584 to 918 millimeters)

Mean annual air temperature: 70 to 73 degrees F (21 to 23 degrees C)
Frost-free period: 240 to 300 days

Composition

Monteola and similar soils: 42 percent
Pernitas and similar soils: 24 percent
Clareville and similar soils: 20 percent
Contrasting soils: 14 percent

Soil Description

Position(s) on landform(s): Monteola—Circular gilgai on broad hill; Pernitas—Side slope or backslope on paleoterrace; Clareville—Base slope on draw (fig. 8)
Parent material: Monteola—calcareous clayey residuum; Pernitas—calcareous loamy alluvium; Clareville—loamy alluvium

Typical Profile

Monteola

Ap—0 to 12 inches; moderately alkaline clay
Bss—12 to 26 inches; moderately alkaline clay
Bkssy—26 to 50 inches; moderately alkaline clay
BCkyz—50 to 80 inches; moderately alkaline clay

Pernitas

A—0 to 11 inches; slightly alkaline sandy clay loam
Bt—10 to 29 inches; moderately alkaline clay loam
Btk—29 to 80 inches; moderately alkaline clay loam

Clareville

A—0 to 9 inches; neutral sandy clay loam
Bt—9 to 38 inches; neutral clay
Bk—38 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: Monteola—1 to 3 percent; Pernitas—2 to 5 percent; Clareville—0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: Monteola—0.001 to 0.06 in/hr (Very slow); Pernitas—0.6 to 2.0 in/hr (Moderate); Clareville—0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: Monteola—About 8.8 inches (Moderate); Pernitas—About 9.6 inches (High); Clareville—About 10.6 inches (High)
Natural drainage class: Well drained
Runoff: Monteola—Medium; Pernitas—Low; Clareville—Negligible
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

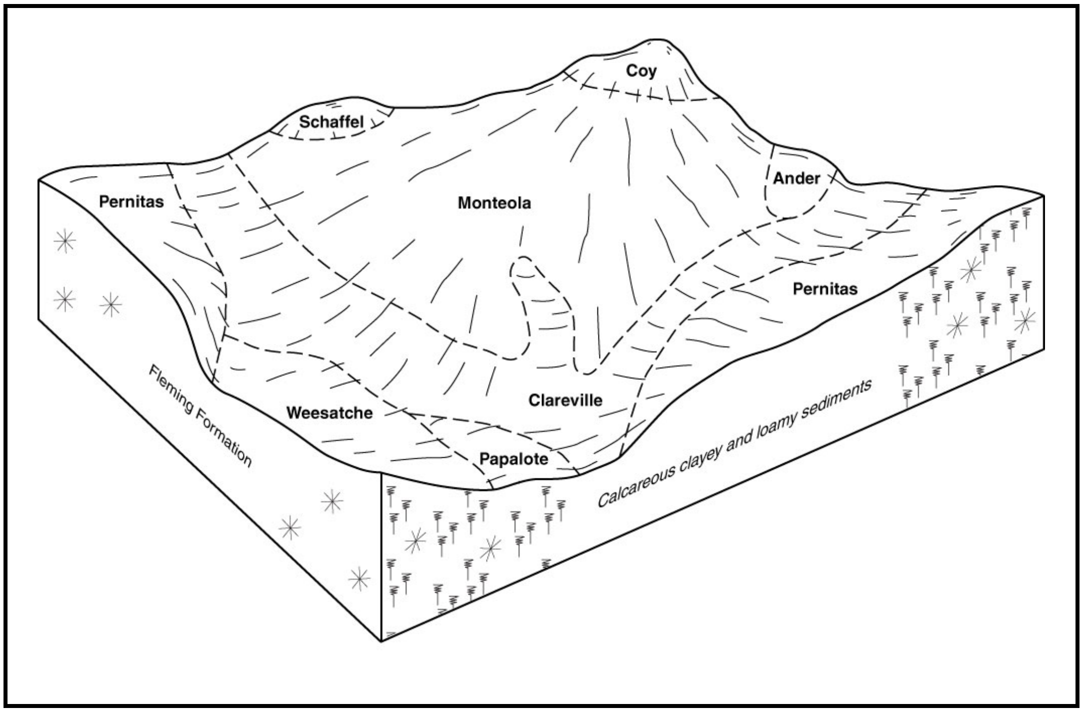

Figure 8.—Patterns of soils and underlying material in the Monteola-Clareville-Pernitas general soil map units.

Interpretive Groups

Land capability nonirrigated: Monteola—3e; Pernitas—3e; Clareville—1
Ecological site name and site number: Monteola—Rolling Blackland 25-35" PZ (R083AY399TX); Pernitas—Gray Sandy Loam 25-35" PZ (R083AY389TX); Clareville—Clay Loam 25-35" PZ (R083AY629TX)
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

6—Buchel-Meguin-Sinton

Setting

General location: Predominantly located on the flood plain of the San Antonio River.
Major land resource area: MLRA 83A—Northern Rio Grande Plain
Landscape: River valley
Elevation: 39 to 1,312 feet (12 to 400 meters)
Mean annual precipitation: 25 to 37 inches (635 to 940 millimeters)
Mean annual air temperature: 70 to 73 degrees F (21 to 23 degrees C)
Frost-free period: 248 to 300 days

Composition

B*uchel and similar soils:* 40 percent
Meguin and similar soils: 24 percent
S*inton and similar soils:* 19 percent
Contrasting soils: 17 percent

Soil Description

Position(s) on landform(s): Buchel—Microlow on flood plain; Meguin—Tread on flood plain; Sinton—Crevasse filling (fig. 9)
Parent material: Buchel—calcareous clayey alluvium; Meguin—calcareous loamy alluvium; Sinton—loamy alluvium

Typical Profile

Buchel

A—0 to 7 inches; moderately alkaline clay
Bss—7 to 36 inches; moderately alkaline clay
Bkss—36 to 80 inches; moderately alkaline clay

Meguin

A—0 to 18 inches; slightly alkaline silty clay loam
Bw1—18 to 41 inches; moderately alkaline clay loam
Bw2—41 to 61 inches; moderately alkaline clay loam
Ab—61 to 80 inches; moderately alkaline clay

Sinton

A1—0 to 17 inches; moderately alkaline sandy clay loam
A2—17 to 41 inches; moderately alkaline sandy clay loam
Bw—41 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: Buchel—0.001 to 0.06 in/hr (Very slow); Meguin and Sinton—0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Buchel—Sodic; Meguin and Sinton—Not Sodic
Sodicity, maximum within 40 inches: Buchel—Sodic; Meguin and Sinton—Not Sodic
Representative total available water capacity to 60 inches: Buchel—About 9.6 inches (High); Meguin—About 11.4 inches (High); Sinton—About 10.8 inches (High)
Natural drainage class: Buchel—Moderately well drained; Meguin and Sinton—Well drained
Runoff: Buchel—Medium; Meguin and Sinton—Negligible
Flooding frequency: Occasional
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: Buchel—3s; Meguin—2w; Sinton—1
Ecological site name and site number: Buchel—Clayey Bottomland 20-35" PZ (R083AY380TX); Meguin and Sinton—Loamy Bottomland 25-35" PZ (R083AY573TX)
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

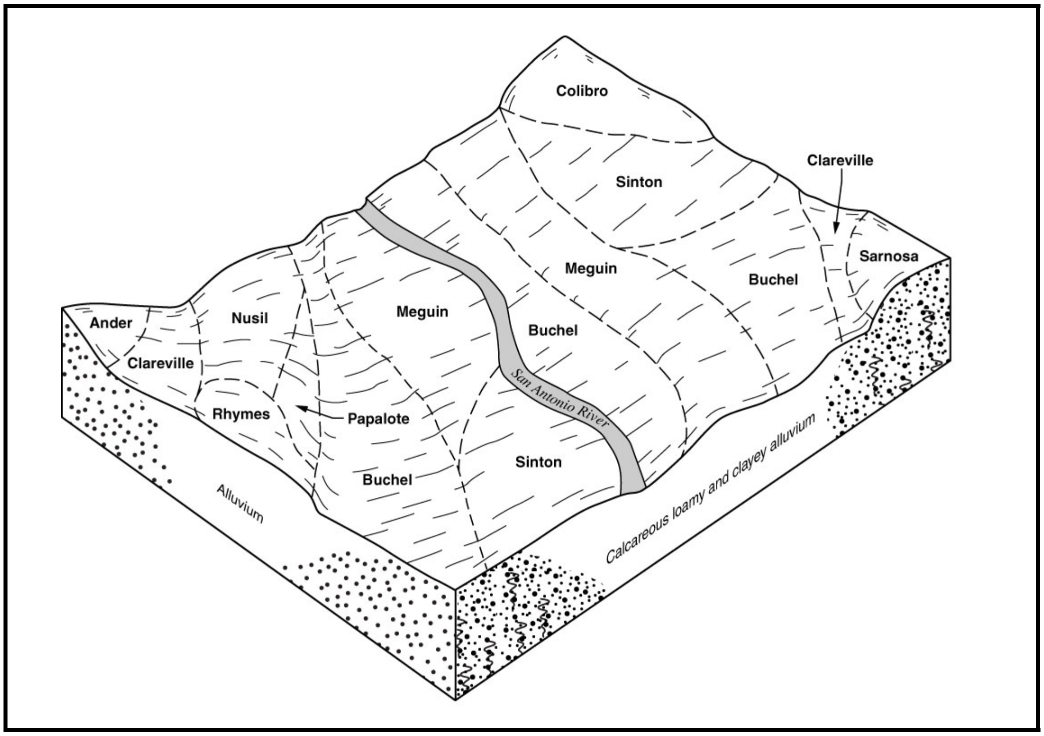

Figure 9.—Pattern of soils and underlying material in the Buchel-Meguin-Sinton general soil map units.

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, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Ander fine sandy loam, 0 to 1 percent slopes is a phase of the Ander series.

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

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. Dacosta-Contee 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. Dams is an example.

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section. Composition is based on observations, descriptions, and or transects of the map unit. For more information about use and management of a map unit, see the section on "Soil Properties" and the section on "Use and Management" which includes subsections on "Crops and Pasture", "Engineering", "Rangeland", "Recreation", and "Wildlife Habitat".

Table 7 shows the acreage and proportionate extent of each map unit. Other tables provide 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.

AnA—Ander fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Ander and similar soils: 85 percent
Contrasting soils: 15 percent

- Papalote soils do not have a mollic epipedon and are on similar landform.
- Weesatche soils have loamy subsoil and are on a similar landform.
- Tiocano soils are clayey, in depressions, and remain ponded for long periods.

Soil Description

Ander

Landscape: Inland, dissected coastal plains (fig. 10)
Landforms: Low hills
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical Profile

A—0 to 12 inches; slightly acid fine sandy loam
Bt1—12 to 30 inches; slightly alkaline sandy clay
Bt2—30 to 48 inches; slightly alkaline sandy clay loam
Bk—48 to 80 inches; moderately alkaline sandy clay loam

Figure 10.—An area of Ander fine sandy loam, 0 to 1 percent slopes. Live oak trees grow well on Ander soils.

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 7 to 16 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.1 inches (High)
Natural drainage class: Moderately well drained
Runoff: Medium
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Tight Sandy Loam 21-35" PZ
Ecological site number: R083AY412TX
Typical vegetation: Trees include hackberry, live oak, and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

AnB—Ander fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Ander and similar soils: 85 percent
Contrasting soils: 15 percent

- Papalote soils do not have a mollic epipedon and are on similar landform.
- Weesatche soils have loamy subsoil and are on a similar landform.
- Tiocano soils are clayey, in depressions, and remain ponded for long periods.

Soil Description

Ander

Landscape: Inland, dissected coastal plains
Landforms: Low hills
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical Profile

A—0 to 12 inches; slightly acid fine sandy loam
Bt1—12 to 17 inches; slightly alkaline sandy clay
Bt2—17 to 38 inches; slightly alkaline sandy clay
Btk—38 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Abrupt textural change: 7 to 16 inches
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 8.9 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Tight Sandy Loam 21-35" PZ
Ecological site number: R083AY412TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

BnB—Blanconia loamy fine sand, 0 to 2 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Prime farmland if irrigated

Composition

Blanconia and similar soils: 85 percent
Contrasting soils: 15 percent

- Greta soils are loamy throughout, have increased salinity, and are on flats on the coastal plains.
- Vidauri soils have loamy subsoil and are on slightly depressional flats on the coastal plains.
- Wyick soils have loamy subsoil and are on slight rises on the coastal plains.

Soil Description

Blanconia

Landscape: Flat coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical Profile

A—0 to 9 inches; strongly acid loamy fine sand
E—9 to 15 inches; moderately acid loamy fine sand
Bt1—15 to 30 inches; moderately acid sandy clay
Bt2—30 to 50 inches; slightly alkaline sandy clay loam
Bk—50 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 2 percent
Depth to first restrictive layer: Abrupt textural change: 9 to 19 inches
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.3 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Tight Sandy Loam 25-35" PZ
Ecological site number: R150AY646TX
Typical vegetation: Trees include post oak and blackjack oak. Range grasses are bluestem and paspalums. Other vegetation includes upland forbs and shrubs.

BsA—Buchel clay, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

B*uchel and similar soils:* 95 percent
Contrasting soils: 5 percent

- Clayey soils similar to Buchel, pond for long periods, and are in open ended depressions on the flood plain.
- Sinton soils are loamy throughout and are on a similar landform.

Soil Description

Buchel

Landscape: River valleys
Landforms: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous clayey alluvium

Typical Profile

A—0 to 7 inches; moderately alkaline clay
Bss—7 to 36 inches; moderately alkaline clay
Bkss—36 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 9.6 inches (High)
Natural drainage class: Moderately well drained
Runoff: Medium
Flooding frequency: Occasional
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3s
Ecological site name: Clayey Bottomland 20-35" PZ
Ecological site number: R083AY380TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

BuA—Buchel clay, 0 to 1 percent slopes, frequently flooded

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

B*uchel and similar soils:* 85 percent
Contrasting soils: 15 percent

- Clayey soils similar to Buchel, pond for long periods, and are in open ended depressions on the flood plain.

Soil Description

Buchel

Landscape: River valleys
Landforms: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous clayey alluvium

Typical Profile

A—0 to 7 inches; moderately alkaline clay
Bss—7 to 55 inches; moderately alkaline clay
Bkss—55 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 9.6 inches (High)
Natural drainage class: Moderately well drained
Runoff: Low
Flooding frequency: Frequent
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 5w
Ecological site name: Clayey Bottomland 20-35" PZ
Ecological site number: R083AY380TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

CnA—Cieno loam, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Cieno and similar soils: 95 percent
Contrasting soils: 5 percent

- Soils similar to Cieno that have a clayey subsoil.

Soil Description

Cieno

Landscape: Flat coastal plains
Landforms: Depressions
Geomorphic positions, three-dimensional: Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy fluviomarine deposits of early Pleistocene age

Typical Profile

A—0 to 7 inches; strongly acid loam
Btg1—7 to 36 inches; moderately acid clay loam
Btg2—36 to 80 inches; slightly acid sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.0 inches (High)
Natural drainage class: Poorly drained
Runoff: Negligible
Flooding frequency: None
Ponding frequency: Frequent
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4w
Ecological site name: Lowland 35-56" PZ
Ecological site number: R150AY537TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

CrA—Clareville sandy clay loam, 0 to 1 percent slopes, rarely flooded

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Clareville and similar soils: 90 percent
Contrasting soils: 10 percent

- Ander soils have a surface layer texture of fine sandy loam surface and are on footslopes on a hillslope.
- Tiocano soils are clayey, in depressions, and remain ponded for long periods.

Soil Description

Clareville

Landscape: Inland dissected coastal plains
Landforms: Draws
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical Profile

A—0 to 9 inches; neutral sandy clay loam
Bt—9 to 38 inches; neutral clay
Bk—38 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 10.6 inches (High)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Rare
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 1
Ecological site name: Clay Loam 25-35" PZ
Ecological site number: R083AY629TX

Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

CrB—Clareville sandy clay loam, 1 to 3 percent slopes, rarely flooded

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Clareville and similar soils: 95 percent
Contrasting soils: 5 percent

- Ander soils have a surface layer texture of fine sandy loam surface and are on footslopes on a hillslope.
- Tiocano soils are clayey, in depressions, and remain ponded for long periods.

Soil Description

Clareville

Landscape: Inland dissected coastal plains
Landforms: Draws
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical Profile

A—0 to 8 inches; neutral sandy clay loam
Bt—8 to 31 inches; neutral clay
Bk—31 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 10.6 inches (High)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Rare
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Clay Loam 25-35" PZ

Ecological site number: R083AY629TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

CsC—Colibro sandy clay loam, 3 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Colibro and similar soils: 85 percent
Contrasting soils: 15 percent

- Pernitas soils have a mollic epipedon, an argillic horizon, and are on a similar landform.
- Sarnosa soils have a mollic epipedon and are on a similar landform.

Soil Description

Colibro

Landscape: Inland, dissected coastal plains
Landforms: Erosional remnants stream terraces
Geomorphic positions, two-dimensional: Shoulder
Geomorphic positions, three-dimensional: Riser
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Calcareous loamy alluvium

Typical Profile

A—0 to 6 inches; moderately alkaline sandy clay loam
Bk1—6 to 48 inches; moderately alkaline sandy clay loam
2Ck—48 to 60 inches; moderately alkaline loam

Properties and Qualities

Slope: 3 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (Moderately rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.7 inches (Moderate)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Gray Sandy Loam 25-35" PZ

Ecological site number: R083AY389TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

CsD—Colibro loam, 5 to 12 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Colibro and similar soils: 85 percent
Contrasting soils: 15 percent

- Pernitas soils have a mollic epipedon, an argillic horizon, and are on a similar landform.
- Sarnosa soils have a mollic epipedon and are on a similar landform.

Soil Description

Colibro

Landscape: Inland, dissected coastal plains
Landforms: Erosional remnants stream terraces
Geomorphic positions, two-dimensional: Shoulder
Geomorphic positions, three-dimensional: Riser
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Calcareous loamy alluvium

Typical Profile

A—0 to 9 inches; moderately alkaline loam
Bk1—9 to 30 inches; moderately alkaline loam
Bk2—30 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 5 to 12 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (Moderately rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.5 inches (Moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Gray Sandy Loam 25-35" PZ

Ecological site number: R083AY389TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

CyB—Coy clay loam, 1 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Coy and similar soils: 94 percent
Contrasting soils: 6 percent

- Monteola soils are clayey throughout and are on a similar landform.
- Pernitas soils have loamy subsoil and are on a similar landform.
- Tiocano soils are clayey, in depressions, and remain ponded for long periods.

Soil Description

Coy

Landscape: Inland, dissected coastal plains
Landforms: Hillslopes
Geomorphic positions, two-dimensional: Summit
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous clayey alluvium derived from shale

Typical Profile

A—0 to 6 inches; moderately alkaline clay loam
Bt—6 to 14 inches; moderately alkaline clay
Btk—14 to 50 inches; moderately alkaline clay
Bky—50 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 8.8 inches (Moderate)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Rolling Blackland 25-35" PZ

Ecological site number: R083AY399TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

CyC—Coy clay loam, 3 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Coy and similar soils: 85 percent
Contrasting soils: 15 percent

- Monteola soils are clayey throughout and are on a similar landform.
- Schattel soils have subsoil with higher chroma and are on the shoulder on hillslopes.

Soil Description

Coy

Landscape: Inland, dissected coastal plains
Landforms: Hillslopes
Geomorphic positions, two-dimensional: Summit
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous clayey alluvium derived from shale

Typical Profile

A—0 to 10 inches; moderately alkaline clay loam
Bt—10 to 20 inches; moderately alkaline clay
Btk—20 to 46 inches; moderately alkaline clay
Bky—46 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 3 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 9.0 inches (High)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Rolling Blackland 25-35" PZ

Ecological site number: R083AY399TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

DaA—Dacosta sandy clay loam, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: All areas are prime farmland

Composition

Dacosta and similar soils: 90 percent
Contrasting soils: 10 percent

- Edna soils have loamy surface layer and are on a slightly lower position on a similar landform.
- Laewest soils are clayey throughout and on a similar landform.

Soil Description

Dacosta

Landscape: Flat coastal plains
Landforms: Flat flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy fluviomarine deposits

Typical Profile

A—0 to 8 inches; neutral sandy clay loam
Bt—8 to 38 inches; neutral clay loam
Btk—38 to 77 inches; slightly alkaline sandy clay loam
2C—77 to 80 inches; slightly alkaline clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.0 inches (High)
Natural drainage class: Moderately well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Blackland 24-44" PZ
Ecological site number: R150AY526TX

Typical vegetation: Range grasses are bluestem and paspalums. Other vegetation includes upland forbs and shrubs.

DAMS—Dams

This map unit is the earthen and concrete structure constructed to impound water on Coleto Creek.

DcA—Dacosta-Contee complex, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: All areas are prime farmland

Composition

Dacosta and similar soils: 60 percent
C*ontee and similar soils:* 30 percent
Contrasting soils: 10 percent

- Edna soils have loamy surface layer and are on a slightly lower position on a similar landform.
- Laewest soils are clayey throughout and on a similar landform.

Soil Description

Dacosta

Landscape: Flat coastal plains
Landforms: Gilgai on flats
Geomorphic positions, three-dimensional: Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy fluviomarine deposits

Typical Profile

A—0 to 10 inches; neutral sandy clay loam
Bt1—10 to 43 inches; neutral clay loam
Bt2—43 to 74 inches; slightly alkaline sandy clay
Btk—74 to 80 inches; slightly alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.3 inches (High)
Natural drainage class: Moderately well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Blackland 24-44" PZ
Ecological site number: R150AY526TX
Typical vegetation: Range grasses are bluestem and paspalums. Other vegetation includes upland forbs and shrubs.

Contee

Landscape: Flat coastal plains
Landforms: Gilgai on flats
Geomorphic positions, three-dimensional: Dip
Down-slope shape: Linear
Aspect, range: East to south (clockwise)
Parent material: Loamy fluviomarine deposits

Typical Profile

A—0 to 8 inches; moderately alkaline clay loam
Bkss—8 to 49 inches; moderately alkaline clay
Bk—49 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.5 inches (High)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3w
Ecological site name: Blackland 24-44" PZ
Ecological site number: R150AY526TX
Typical vegetation: Range grasses are bluestem and paspalums. Other vegetation includes upland forbs and shrubs.

DeC—Devine very gravelly fine sandy loam, 1 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

D*evine and similar soils:* 90 percent
Contrasting soils: 10 percent

- Papalote soils do not have gravel and are a similar landform.

- Raisin soils do not have gravel, have loamy subsoil, and are on a similar landform.

Soil Description

Devine

Landscape: Inland, dissected coastal plains
Landforms: High terraces
Geomorphic positions, two-dimensional: Summit
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Parent material: Loamy alluvium

Typical Profile

A—0 to 10 inches; slightly acid very gravelly fine sandy loam
Bt—10 to 47 inches; neutral very gravelly clay
Btk—47 to 53 inches; neutral very gravelly sandy clay
2C—53 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 1 percent subrounded cobbles, about 40 percent subrounded gravel
Depth to first restrictive layer: 6 to 18 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 4.2 inches (Low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Gravelly Ridge 20-35" PZ
Ecological site number: R083AY386TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

DUMPS—Dumps

This map unit consists of stockpiled coal and the discarded fly ash at the power generator plant located near Coleto Creek Reservoir. The coal stockpiles can be over 30 meters (100 feet) tall and cover more than 1 acre per stockpile. These areas are steep vertically and typically rectangular or oval in shape with defined boundaries. The fly ash areas are locations where the burned coal ash is discarded. These areas can be up to 30 meters (100 feet) tall and are similar in shape to the coal stockpiles.

EbA—Edna fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Edna and similar soils: 95 percent
Contrasting soils: 5 percent

- Cieno soils pond for long periods and are in enclosed depressions.
- Telferner soils a thicker surface layer and are on a slight rise on a similar landform.

Soil Description

Edna

Landscape: Flat coastal plains
Landforms: Flats
Geomorphic positions, three-dimensional: Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy fluviomarine deposits of late Pleistocene age

Typical Profile

A—0 to 9 inches; slightly acid fine sandy loam
Bt1—9 to 30 inches; slightly acid clay
Bt2—30 to 50 inches; slightly alkaline clay loam
Btk—50 to 80 inches; slightly alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 4 to 10 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.8 inches (Moderate)
Natural drainage class: Somewhat poorly drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3w
Ecological site name: Claypan Prairie 28-44" PZ
Ecological site number: R150AY528TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

EdA—Edroy clay, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Edroy and similar soils: 95 percent
Contrasting soils: 5 percent

Soil Description

Edroy

Landscape: Coastal plains
Landforms: Depressions
Geomorphic positions, three-dimensional: Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey over loamy fluviomarine deposits of late Pleistocene age

Typical Profile

A—0 to 7 inches; neutral clay
Bss—7 to 57 inches; slightly alkaline clay
Bkss—57 to 70 inches; moderately alkaline clay
2Bk—70 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.9 inches (Moderate)
Natural drainage class: Poorly drained
Runoff: Negligible
Flooding frequency: None
Ponding frequency: Frequent
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4w
Ecological site name: Lakebed 25-35" PZ
Ecological site number: R150AY641TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

EnB—Elmendorf-Denhawken complex, 1 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Elmendorf and similar soils: 50 percent
Denhawken and similar soils: 45 percent
Contrasting soils: 5 percent

- Coy soils do not have a cyclical profile of microhighs and microlows and are on a similar landform.
- Monteola soils are clayey throughout and are on a similar landform.

Soil Description

Elmendorf

Landscape: Inland, dissected coastal plains
Landforms: Microlow circular gilgai on broad interfluves
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Calcareous, clayey residuum weathered from shale

Typical Profile

A—0 to 6 inches; slightly alkaline sandy clay loam
Bt—6 to 26 inches; slightly alkaline clay
Btk1—26 to 55 inches; moderately alkaline clay loam
Btk2—55 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 8.4 inches (Moderate)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Blackland 25-35" PZ
Ecological site number: R083AY379TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

Denhawken

Landscape: Inland, dissected coastal plains
Landforms: Microhigh circular gilgai on broad interfluves
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous, clayey residuum weathered from shale

Typical Profile

A—0 to 6 inches; slightly alkaline clay loam
Bk—6 to 41 inches; slightly alkaline clay loam
BCky—41 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.1 inches (Moderate)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Blackland 25-35" PZ
Ecological site number: R083AY379TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

FdA—Faddin fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies (fig. 11)
Map unit prime farmland class: Not prime farmland

Composition

F*addin and similar soils:* 85 percent
Contrasting soils: 15 percent

- Cieno soils pond for long periods and are in enclosed depressions.
- Telferner soils have surface layer color with higher value and are on a similar landform.

Figure 11.—Big bluestem growing on an area of Faddin fine sandy loam, 0 to 1 percent slopes. Faddin soils are in the Loamy Prairie ecological site on the Gulf Coast Prairie.

Soil Description

Faddin

Landscape: Flat coastal plains
Landforms: Abandoned meander scrolls
Geomorphic positions, three-dimensional: Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits of late Pleistocene age

Typical Profile

A—0 to 16 inches; slightly acid fine sandy loam
Bt—16 to 46 inches; neutral clay
Btk—46 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 8 to 20 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.7 inches (High)
Natural drainage class: Moderately well drained
Runoff: Low

Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Loamy Prairie 28-40" PZ
Ecological site number: R150AY535TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

GdB—Goliad fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

G*oliad and similar soils:* 86 percent
Contrasting soils: 14 percent

- Parrita are shallow to petrocalcic and are on a similar landform.
- Weesatche do not have a petrocalcic, are loamy throughout, and are on a backslope on a hillslope landform.

Soil Description

Goliad

Landscape: Inland dissected coastal plains
Landforms: Low hills
Geomorphic positions, two-dimensional: Shoulder
Geomorphic positions, three-dimensional: Crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 10 inches; neutral fine sandy loam
Bt—10 to 25 inches; neutral sandy clay
Bkkm1—25 to 35 inches; cemented material
Bkkm2—35 to 80 inches; cemented material

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: 25 to 40 inches; cemented horizon
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 3.4 inches (Low)
Natural drainage class: Well drained
Runoff: Medium

Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Sandy Loam 25-35" PZ
Ecological site number: R083AY407TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

GoB—Goliad sandy clay loam, 1 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

G*oliad and similar soils:* 95 percent
Contrasting soils: 5 percent

- Parrita are shallow to petrocalcic and are on a similar landform.
- Weesatche do not have a petrocalcic, are loamy throughout, and are on a backslope on a hillslope landform.

Soil Description

Goliad

Landscape: Inland dissected coastal plains
Landforms: Low hills
Geomorphic positions, two-dimensional: Shoulder
Geomorphic positions, three-dimensional: Crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 13 inches; slightly alkaline sandy clay loam
Bt—13 to 17 inches; moderately alkaline sandy clay loam
Btk—17 to 37 inches; moderately alkaline sandy clay
Bkkm1—37 to 49 inches; cemented material
Bkkm2—49 to 80 inches; cemented material

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: 22 to 80 inches; petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 4.5 inches (Low)
Natural drainage class: Well drained

Runoff: Medium
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Clay Loam 25-35" PZ
Ecological site number: R083AY629TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

GrA—Greta fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Greta and similar soils: 85 percent
Contrasting soils: 15 percent

- Edroy soils are clayey and are in enclosed depressions.
- Wyick soils have loamy subsoil and are on slight rises on the coastal plains.
- Vidauri soils have loamy subsoil and are on slightly depressional flats on the coastal plains.

Soil Description

Greta

Landscape: Coastal plains
Landforms: Flats
Geomorphic positions, three-dimensional: Rise, talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy fluviomarine deposits

Typical Profile

A—0 to 5 inches; neutral fine sandy loam
Btn1—5 to 13 inches; neutral sandy clay loam
Btn2—13 to 34 inches; moderately alkaline sandy clay loam
Btkn—34 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Percent of area covered by surface fragments: About 0 percent (shape or size unspecified)
Depth to first restrictive layer: 4 to 7 inches; abrupt textural change; 4 to 20 inches; natric
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Sodic

Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 6.7 inches (Moderate)
Natural drainage class: Somewhat poorly drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4s
Ecological site name: Salty Prairie 25-35" PZ
Ecological site number: R150AY540TX
Typical vegetation: Range grasses are sliver bluestem, Texas grama, and threeawn. Other vegetation includes cacti and salt tolerant upland forbs and shrubs.

ImA—Imogene fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Imogene and similar soils: 95 percent
Contrasting soils: 5 percent

- Clareville soils have clayey subsoil and are on a similar landform.

Soil Description

Imogene

Landscape: River valleys, inland, dissected coastal plains
Landforms: Low stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Saline loamy alluvium

Typical Profile

A—0 to 6 inches; neutral fine sandy loam
Btn1—6 to 25 inches; neutral sandy clay loam
Btn2—25 to 65 inches; neutral sandy clay loam
Btkn—65 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 2 to 10 inches; natric
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 5.8 inches (Moderate)

Figure 12.—Barren areas, shown on the soil surface, are caused by high salinity in Imogene fine sandy loam, 0 to 1 percent slopes. Imogene soils are in the Tight Sandy Loam ecological site.

Natural drainage class: Moderately well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4s
Ecological site name: Tight Sandy Loam 21-35" PZ (fig. 12)
Ecological site number: R083AY412TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

InA—Inari fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies (fig. 13)
Map unit prime farmland class: All areas are prime farmland

Composition

Inari and similar soils: 85 percent
Contrasting soils: 15 percent

- Edroy soils are clayey and are in enclosed depressions.

Figure 13.—Prairie vegetation on an area of Inari fine sandy loam, 0 to 1 percent slopes. Inari soils are in the Loamy Prairie ecological site.

- Greta soils do not have a mollic surface epipedon, have increased salinity, and are on flats on the coastal plains.
- Wyick soils do not have a mollic surface epipedon and are on a slight rise on the coastal plains.
- Vidauri soils do not have a mollic surface epipedon and are on slightly depressional flats on the coastal plains.

Soil Description

Inari

Landscape: Flat coastal plains
Landforms: Flats
Geomorphic positions, three-dimensional: Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits of Pleistocene age

Typical Profile

A—0 to 11 inches; slightly acid fine sandy loam
Bt1—11 to 18 inches; slightly acid sandy clay
Bt2—18 to 36 inches; neutral sandy clay loam
Btk—36 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 8 to 20 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.6 inches (High)
Natural drainage class: Moderately well drained
Runoff: Medium
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 1
Ecological site name: Loamy Prairie 28-40" PZ
Ecological site number: R150AY535TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

InB—Inari fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: All areas are prime farmland

Composition

Inari and similar soils: 85 percent
Contrasting soils: 15 percent

- Greta soils do not have a mollic surface epipedon, have increased salinity, and are on flats on the coastal plains.
- Wyick soils do not have a mollic surface epipedon and are on a slight rise on the coastal plains.

Soil Description

Inari

Landscape: Flat coastal plains
Landforms: Flats
Geomorphic positions, three-dimensional: Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits of late Pleistocene age

Typical Profile

A—0 to 13 inches; slightly acid fine sandy loam
Bt—13 to 40 inches; neutral sandy clay loam
Btk—40 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: 8 to 20 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.7 inches (High)
Natural drainage class: Moderately well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Loamy Prairie 28-40" PZ
Ecological site number: R150AY535TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

KyB—Kuy fine sand, 1 to 3 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Kuy and similar soils: 95 percent
Contrasting soils: 5 percent

- Milby soils have a thinner sandy surface layer and are on a similar landform.
- Soils similar to Kuy but do not have an argillic horizon within 200 centimeters (80 inches) of the soil surface.

Soil Description

Kuy

Landscape: Coastal plains, river valleys
Landforms: Terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy and sandy alluvium of Pleistocene age

Typical Profile

A—0 to 12 inches; slightly acid fine sand
E—12 to 66 inches; slightly acid fine sand
Bt—66 to 80 inches; moderately acid sandy clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 6.0 to 20 in/hr (Rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 5.4 inches (Low)

Natural drainage class: Moderately well drained
Runoff: Negligible
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3s
Ecological site name: Deep Sand 35-42" PZ
Ecological site number: R150AY532TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

LaA—Laewest clay, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: All areas are prime farmland

Composition

Laewest and similar soils: 95 percent
Contrasting soils: 5 percent

- Dacosta soils have a loamy surface texture and are on a similar landform.

Soil Description

Laewest

Landscape: Coastal plains
Landforms: Gilgai on flats
Geomorphic positions, three-dimensional: Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey fluviomarine deposits of late Pleistocene age

Typical Profile

A—0 to 6 inches; slightly acid clay
Bss—6 to 40 inches; slightly acid clay
Bkss—40 to 62 inches; slightly alkaline clay
BCk—62 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 10.8 inches (High)
Natural drainage class: Moderately well drained
Runoff: High
Flooding frequency: None

Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2s
Ecological site name: Blackland 24-44" PZ
Ecological site number: R150AY526TX
Typical vegetation: Range grasses are bluestem and paspalums. Other vegetation includes upland forbs and shrubs.

LaB—Laewest clay, 1 to 3 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: All areas are prime farmland

Composition

Laewest and similar soils: 95 percent
Contrasting soils: 5 percent

- Dacosta soils have a loamy surface texture and are on a slightly lower position on a similar landform.

Soil Description

Laewest

Landscape: Flat coastal plains
Landforms: Gilgai on flats
Geomorphic positions, three-dimensional: Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey fluviomarine deposits of late Pleistocene age

Typical Profile

A—0 to 6 inches; slightly acid clay
Bss—6 to 46 inches; slightly acid clay
Bkss—46 to 80 inches; slightly alkaline clay

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 10.8 inches (High)
Natural drainage class: Moderately well drained
Runoff: Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Blackland 24-44" PZ
Ecological site number: R150AY526TX
Typical vegetation: Range grasses are bluestem and paspalums. Other vegetation includes upland forbs and shrubs.

LaD—Laewest clay, 3 to 8 percent slopes, eroded

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Laewest e*roded and similar soils:* 80 percent
Contrasting soils: 20 percent

- Dacosta soils have a loamy surface texture and are on a lower position on a similar landform.
- Soils that have a loamy surface layer within 100 centimeters (40 inches) of the soil surface and are on a similar landform.

Soil Description

Laewest, Eroded

Landscape: Flat coastal plains
Landforms: Gilgai on dissected flats
Geomorphic positions, three-dimensional: Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey fluviomarine deposits of late Pleistocene age

Typical Profile

A—0 to 10 inches; neutral clay
Bss1—10 to 24 inches; neutral clay
Bss2—24 to 60 inches; slightly alkaline clay
Bkss—60 to 80 inches; slightly alkaline clay

Properties and Qualities

Slope: 3 to 8 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 10.8 inches (High)
Natural drainage class: Moderately well drained
Runoff: Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Blackland 24-44" PZ
Ecological site number: R150AY526TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

LmB—Leming loamy fine sand, 0 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Prime farmland if irrigated

Composition

L*eming and similar soils:* 85 percent
Contrasting soils: 15 percent

- Papalote soils have a surface layer less than 50 centimeters (20 inches) thick and are on a similar landform.

Soil Description

Leming

Landscape: Inland, dissected coastal plains
Landforms: High stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium of Pleistocene age

Typical Profile

A—0 to 8 inches; neutral loamy fine sand
E—8 to 28 inches; neutral loamy fine sand
Bt1—28 to 48 inches; neutral sandy clay
Bt2—48 to 80 inches; neutral sandy clay loam

Properties and Qualities

Slope: 0 to 3 percent
Depth to first restrictive layer: 20 to 34 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.8 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: Medium
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Loamy Sand 25-35" PZ
Ecological site number: R083AY396TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

MbB—Milby fine sand, 0 to 2 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Milby and similar soils: 90 percent
Contrasting soils: 10 percent

- Kuy soils have a sandy surface layer more than 100 centimeters (40 inches) thick and are on a similar landform.

Soil Description

Milby
Landscape: Coastal plains, river valleys
Landforms: Terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy and sandy alluvium of Pleistocene age

Typical Profile

A—0 to 11 inches; moderately acid fine sand
E—11 to 28 inches; moderately acid sand
Bt—28 to 80 inches; slightly acid sandy clay loam

Properties and Qualities

Slope: 0 to 2 percent
Depth to first restrictive layer: 22 to 35 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 6.1 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: Very low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3s
Ecological site name: Sandy 25-35" PZ
Ecological site number: R150AY644TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

MeA—Meguin silty clay loam, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: 83A—Northern Rio Grande Plain (fig. 14)
Map unit prime farmland class: Not prime farmland

Composition

M*eguin and similar soils:* 95 percent
Contrasting soils: 5 percent

- Buchel soils are clayey throughout and are on a lower position on a similar landform.
- Soils similar to Buchel that remain ponded for long periods and are in open ended depressions on the flood plain.
- Zunker soils do not have a mollic surface and are on a similar landform.

Figure 14.—Plowed field of Meguin silty clay loam, 0 to 1 percent slopes, occasionally flooded. Many of the soils along the San Antonio River are used for cropland.

Soil Description

Meguin

Landscape: River valleys
Landforms: Flood plains
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical Profile

A—0 to 18 inches; slightly alkaline silty clay loam
Bw1—18 to 41 inches; moderately alkaline clay loam
Bw2—41 to 61 inches; moderately alkaline clay loam
Bssb—61 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 11.4 inches (High)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Occasional
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Loamy Bottomland 25-35" PZ
Ecological site number: R083AY573TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

MgA—Meguin silty clay loam, 0 to 1 percent slopes, frequently flooded

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

M*eguin and similar soils:* 95 percent
Contrasting soils: 5 percent

- Buchel soils are clayey throughout and are on a lower position on a similar landform.

- Soils similar to Buchel that remain ponded for long periods and are in open ended depressions on the flood plain.
- Zunker soils do not have a mollic surface and are on a similar landform.

Soil Description

Meguin

Landscape: River valleys
Landforms: Flood plains
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical Profile

A—0 to 11 inches; slightly alkaline silty clay loam
Bw1—11 to 46 inches; moderately alkaline loam
Bw2—46 to 58 inches; moderately alkaline clay loam
Bssb—58 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 11.4 inches (High)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Frequent
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3w
Ecological site name: Loamy Bottomland 25-35" PZ
Ecological site number: R083AY573TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

MoA—Monteola clay, 0 to 1 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Monteola and similar soils: 95 percent
Contrasting soils: 5 percent

- Coy soils have a loamy surface layer, do not have a cyclical profile of microhighs and microlows, and are on a similar landform.
- Tiocano soils are noncalcareous in the surface layer, in depressions, and remain ponded for long periods.

Soil Description

Monteola

Landscape: Inland, dissected coastal plains
Landforms: Circular gilgai on hills
Geomorphic positions, two-dimensional: Summit
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous clayey residuum weathered from shale

Typical Profile

A—0 to 8 inches; moderately alkaline clay
Bss—8 to 30 inches; moderately alkaline clay
Bkss—30 to 62 inches; moderately alkaline clay
BCky—62 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.3 inches (High)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2s (fig. 15)
Ecological site name: Blackland 25-35" PZ
Ecological site number: R083AY379TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

MoB—Monteola clay, 1 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Figure 15.—A stand of haygrazer growing on an area of Monteola clay, 0 to 1 percent slopes.

Composition

Monteola and similar soils: 85 percent
Contrasting soils: 15 percent

- Coy soils have a loamy surface layer, do not have a cyclical profile of microhighs and microlows, and are on a similar landform.
- Schattel soils have a subsoil color with higher chroma and are on a slightly higher position on a similar landform.

Soil Description

Monteola

Landscape: Inland, dissected coastal plains
Landforms: Circular gilgai on broad hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Calcareous clayey residuum

Typical Profile

A—0 to 12 inches; moderately alkaline clay
Bss—12 to 26 inches; moderately alkaline clay
Bkss—26 to 50 inches; moderately alkaline clay
BCky—50 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.3 inches (High)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Rolling Blackland 25-35" PZ
Ecological site number: R083AY399TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

MoC—Monteola clay, 3 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Monteola and similar soils: 85 percent
Contrasting soils: 15 percent

- Schattel soils have a subsoil color with higher chroma and are on a slightly higher position on a similar landform.

Soil Description

Monteola

Landscape: Inland, dissected coastal plains
Landforms: Circular gilgai on broad hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Calcareous clayey residuum

Typical Profile

A—0 to 8 inches; moderately alkaline clay
Bss—8 to 23 inches; moderately alkaline clay
Bkss—23 to 54 inches; moderately alkaline clay
BCky—54 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 3 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.3 inches (High)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Rolling Blackland 25-35" PZ
Ecological site number: R083AY399TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

NuC—Nusil fine sand, 1 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Nusil and similar soils: 90 percent
Contrasting soils: 10 percent

- Raisin soils have a sandy surface layer less than 50 centimeters (20 inches) thick and are on a similar landform.
- Rhymes soils have a sandy surface layer more than 100 centimeters (40 inches) thick and are on a similar landform.

Soil Description

Nusil

Landscape: River valleys, coastal plains
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Eolian sands over loamy alluvium

Typical Profile

A—0 to 5 inches; slightly acid fine sand
E—5 to 23 inches; slightly acid fine sand
Bt1—23 to 53 inches; slightly acid sandy clay loam
Bt2—53 to 80 inches; slightly alkaline fine sandy loam

Properties and Qualities

Slope: 1 to 5 percent
Depth to first restrictive layer: 22 to 35 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.0 inches (Moderate)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Sandy 20-35" PZ (fig. 16)
Ecological site number: R083AY406TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

OdA—Odem-Riverwash complex, 0 to 1 percent, frequently flooded

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Prime farmland if irrigated

Figure 16.—Poppies on an area of Nusil fine sand, 1 to 5 percent slopes. The stand of huisache in the background is a depression of Realitos clay, 0 to 1 percent slopes.

Composition

Odem and similar soils: 50 percent
Riverwash and similar soils: 45 percent
Contrasting soils: 5 percent

- Zunker soils that do not have a mollic epipedon, are calcareous to the surface, and are a slightly lower position on a similar landform.

Soil Description

Odem

Landscape: River valleys, coastal plains
Landforms: Natural levees (fig. 17)
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium of Holocene age

Typical Profile

A—0 to 28 inches; neutral fine sandy loam
Bw—28 to 59 inches; neutral fine sandy loam
C—59 to 80 inches; neutral fine sandy loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present

Figure 17.—An area of Odem-Riverwash complex, 0 to 1 percent slopes, frequently flooded. The Odem soils, as seen in the roadcut, occupy the levees adjacent to the creek channel. Riverwash areas occur in the active creek channel, and do not have vegetation.

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (Moderately rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.8 inches (Moderate)
Natural drainage class: Well drained*Runoff:* Negligible
Flooding frequency: Rare
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2s
Ecological site name: Loamy Bottomland 25-44" PZ
Ecological site number: R150AY534TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

Riverwash

Landscape: River valleys, coastal plains
Landforms: Bars and channels on flood plains
Geomorphic positions, three-dimensional: Flat
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy alluvium of Holocene age

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 6.0 to 20 in/hr (Rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 4.2 inches (Low)
Natural drainage class: Excessively drained
Runoff: Negligible
Flooding frequency: Frequent
Ponding frequency: Not ponded
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 5w
Ecological site name: Not assigned
Ecological site number: Not assigned
Typical vegetation: Not assigned

OmD—Olmedo very gravelly loam, 1 to 8 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

O*lmedo and similar soils:* 90 percent
Contrasting soils: 10 percent

- Goliad soils have an argillic horizon, are moderately deep, do not have gravel, and are on a similar landform.
- Parrita soils have an argillic horizon, do not have gravel, and are on a similar landform.
- Pettus soils do not have a petrocalcic horizon and are on a similar landform.

Soil Description

Olmedo

Landscape: Inland, dissected coastal plains
Landforms: Interfluves
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy residuum of Miocene-Pliocene age

Typical Profile

A1—0 to 6 inches; moderately alkaline very gravelly loam
A2—6 to 14 inches; moderately alkaline very gravelly loam
Bkkm—14 to 23 inches; moderately alkaline cemented material
BCk—23 to 80 inches; moderately alkaline silt loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 13 percent subangular medium and coarse gravel, about 2 percent angular (shape or size unspecified)
Depth to first restrictive layer: 10 to 20 inches; petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 1.1 inches (Very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Shallow Ridge 20-25" PZ (fig. 18)
Ecological site number: R083CY485TX
Typical vegetation: Native woody species include ceniza, guajillo, elbowbush, mescal bean, vine ephedra, and Texas kidneywood. Native grass species include Arizona cottontop, pinhole bluestem, plains bristlegrass, and sideoats grama.

OrA—Orelia fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

O*relia and similar soils:* 90 percent
Contrasting soils: 10 percent

- Greta soils do not have a mollic epipedon and are on slightly lower position on a similar landform.
- Edroy soils are clayey and are in enclosed depressions.
- Wyick soils do not have a mollic epipedon and are on a similar landform.

Figure 18.—Fragments of petrocalcic material on the surface of Olmedo very gravelly loam, 1 to 8 percent slopes. The Olmedo soils are in the Shallow Ridge ecological site.

Soil Description

Orelia

Landscape: Flat coastal plains
Landforms: Flat flats
Geomorphic positions, three-dimensional: Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits

Typical Profile

A—0 to 5 inches; neutral fine sandy loam
Bt—5 to 39 inches; neutral sandy clay loam
Btk—39 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 8.1 inches (Moderate)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Loamy Prairie 28-40" PZ
Ecological site number: R150AY535TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

PaB—Papalote loamy sand, 0 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Prime farmland if irrigated

Composition

Papalote and similar soils: 90 percent
Contrasting soils: 10 percent

- Raisin soils have loamy subsoil and are on a similar landform.
- Tiocano soils are clayey, in depressions, and remain ponded for long periods.

Soil Description

Papalote

Landscape: Inland, dissected coastal plains
Landforms: High stream terraces
Geomorphic positions, two-dimensional: Footslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical Profile

A—0 to 9 inches; neutral loamy sand
Bt1—9 to 28 inches; slightly acid sandy clay
Bt2—28 to 36 inches; slightly alkaline sandy clay loam
Btk—36 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 0 to 3 percent
Depth to first restrictive layer: 6 to 18 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.7 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Loamy Sand 25-35" PZ
Ecological site number: R083AY396TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

PbA—Papalote fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Papalote and similar soils: 95 percent
Contrasting soils: 5 percent

- Ander soils have a mollic epipedon and are on a similar landform.
- Raisin soils have loamy subsoil and are on a similar landform.
- Tiocano soils are clayey, in depressions, and remain ponded for long periods.

Soil Description

Papalote

Landscape: Inland, dissected coastal plains
Landforms: High stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium of Pleistocene and Pliocene age

Typical Profile

A—0 to 8 inches; moderately acid fine sandy loam
Bt—8 to 24 inches; slightly acid sandy clay
Btk1—24 to 52 inches; slightly alkaline sandy clay loam
Btk2—52 to 80 inches; slightly alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Abrupt textural change: 6 to 18 inches
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.1 inches (High)
Natural drainage class: Moderately well drained
Runoff: Medium
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2c
Ecological site name: Tight Sandy Loam 21-35" PZ
Ecological site number: R083AY412TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

PbB—Papalote fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Landscape: Inland, dissected coastal plains
Map unit prime farmland class: All areas are prime farmland

Composition

Papalote and similar soils: 90 percent
Contrasting soils: 10 percent

- Ander soils have a mollic epipedon and are on a similar landform.
- Raisin soils have loamy subsoil and are on a similar landform.

Soil Description

Papalote

Landforms: High stream terraces
Geomorphic positions, three-dimensional: Riser
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium of Pleistocene and Pliocene age

Typical Profile

A—0 to 8 inches; neutral fine sandy loam
Bt1—8 to 27 inches; neutral sandy clay
Bt2—27 to 34 inches; slightly alkaline sandy clay loam
Btk—34 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: 6 to 18 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.2 inches (High)
Natural drainage class: Moderately well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Tight Sandy Loam 21-35" PZ
Ecological site number: R083AY412TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

PITS—Pits

This map unit consists of areas excavated for predominantly caliche and to a lesser extent gravel. These areas are typically rectangular in shape but some areas are oval or irregular. These pits can be 10 meters (33 feet) deep with shear walls and range in size from less than 1 acre to more than 5 acres. Some pits have been abandoned and have some vegetation on the floor and sides, and some are converted into stock ponds.

PrB—Parrita sandy clay loam, 0 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Parrita and similar soils: 85 percent
Contrasting soils: 15 percent

- Goliad soils, have clayey subsoil, are moderately deep, and are on a similar landform.
- Weesatche soils do not have a petrocalcic horizon and are on slightly lower position on a similar landform.

Soil Description

Parrita

Landscape: Inland, dissected coastal plains
Landforms: Low hills
Geomorphic positions, two-dimensional: Summit
Geomorphic positions, three-dimensional: Head slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 6 inches; slightly alkaline sandy clay loam
Bt—6 to 18 inches; slightly alkaline sandy clay loam
Bkkm—18 to 33 inches; moderately alkaline cemented material
BCk—33 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 0 to 3 percent
Depth to first restrictive layer: 14 to 20 inches; petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 2.7 inches (Very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Shallow Sandy Loam 25-35" PZ (fig. 19)
Ecological site number: R083AY410TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

Figure 19.—An area of Parrita sandy clay loam, 0 to 3 percent slopes. Proper management of these shallow soils helps keep invasive woody species from spreading. These areas are in the Shallow Sandy Loam ecological site.

PtC—Pernitas sandy clay loam, 2 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain (fig. 20)
Map unit prime farmland class: All areas are prime farmland

Composition

Pernitas and similar soils: 85 percent
Contrasting soils: 15 percent

- Colibro soils do not have a mollic epipedon and are on a similar landform.
- Sarnosa soils have less clay throughout and are on a similar landform.
- Weesatche soils are noncalcareous to the surface and are on a similar landform.

Soil Description

Pettus

Landscape: Inland, dissected coastal plains
Landforms: Hills
Geomorphic positions, two-dimensional: Shoulder
Geomorphic positions, three-dimensional: Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Figure 20.—A pasture on an area of Pernitas sandy clay loam, 2 to 5 percent slopes. Pernitas soils are in the Gray Sandy Loam ecological site.

Typical Profile

A—0 to 11 inches; moderately alkaline loam
Bk1—11 to 25 inches; moderately alkaline very gravelly loam
Bk2—25 to 35 inches; moderately alkaline very gravelly loam
Bk3—35 to 80 inches; moderately alkaline very gravelly loam

Properties and Qualities

Slope: 2 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.4 inches (High)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Gray Sandy Loam 25-35" PZ

Ecological site number: R083AY389TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

PuC—Pettus loam, 2 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

P*ettus and similar soils:* 85 percent
Contrasting soils: 15 percent

- Olmedo soils have a petrocalcic horizon within 50 centimeters (20 inches) of the soil surface and are on a similar landform.
- Pernitas soils have an argillic horizon and are on a similar landform.

Soil Description

Pettus

Landscape: Inland, dissected coastal plains
Landforms: Hills
Geomorphic positions, two-dimensional: Shoulder
Geomorphic positions, three-dimensional: Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 11 inches; moderately alkaline loam
Bk1—11 to 25 inches; moderately alkaline very gravelly loam
Bk2—25 to 35 inches; moderately alkaline very gravelly loam
Bk3—35 to 80 inches; moderately alkaline very gravelly loam

Properties and Qualities

Slope: 2 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 4.7 inches (Low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Gravelly Ridge 20-35" PZ

Ecological site number: R083AY386TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

RaB—Raisin loamy fine sand, 0 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

R*aisin and similar soils:* 95 percent
Contrasting soils: 5 percent

- Nusil soils have a sandy surface layer more than 50 centimeters (20 inches) thick and are on a similar landform.

Soil Description

Raisin

Landscape: Inland, dissected coastal plains
Landforms: High stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium of Quaternary age

Typical Profile

A—0 to 5 inches; slightly acid loamy fine sand
E—5 to 19 inches; slightly acid loamy fine sand
Bt1—19 to 25 inches; slightly acid sandy clay loam
Bt2—25 to 67 inches; slightly acid sandy clay loam
Btk—67 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 0 to 3 percent
Depth to first restrictive layer: 8 to 20 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.9 inches (Moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Loamy Sand 25-35" PZ
Ecological site number: R083AY396TX

Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

RaC—Raisin loamy fine sand, 3 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Prime farmland if irrigated

Composition

R*aisin and similar soils:* 95 percent
Contrasting soils: 5 percent

- Nusil soils have a sandy surface layer more than 50 centimeters (20 inches) thick and are on a similar landform.

Soil Description

Raisin

Landscape: Inland, dissected coastal plains
Landforms: High stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium of Quaternary age

Typical Profile

A—0 to 9 inches; neutral loamy fine sand
Bt1—9 to 19 inches; neutral sandy clay loam
Bt2—19 to 38 inches; neutral sandy clay loam
Btk—38 to 80 inches; moderately alkaline fine sandy loam

Properties and Qualities

Slope: 3 to 5 percent
Depth to first restrictive layer: 6 to 18 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.2 inches (Moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Loamy Sand 25-35" PZ
Ecological site number: R083AY396TX

Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

RaC2—Raisin loamy fine sand, 2 to 5 percent slopes, moderately eroded

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Raisin and similar soils: 90 percent
Contrasting soils: 10 percent

- Ander soils have a clayey argillic horizon and are on a similar landform.
- Papalote soils have a clayey argillic horizon and are on a similar landform.
- Weesatche soils have a mollic epipedon and are on a similar landform.
- Wyick soils remain saturated in the upper argillic horizon and are on flats on the coastal plains.

Soil Description

Raisin

Landscape: Inland dissected coastal plains
Landforms: Hillslopes
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical Profile

A—0 to 4 inches; neutral loamy fine sand
Bt—4 to 18 inches; slightly acid sandy clay loam
Btk—18 to 80 inches; slightly alkaline sandy clay loam

Properties and Qualities

Slope: 2 to 5 percent
Depth to first restrictive layer: 2 to 6 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 10.1 inches (High)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Loamy Sand 25-35" PZ
Ecological site number: R083AY407TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

RnB—Raisin fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

R*aisin and similar soils:* 90 percent
Contrasting soils: 10 percent

- Ander soils have a clayey argillic horizon and are on a similar landform.
- Papalote soils have a clayey argillic horizon and are on a similar landform.
- Weesatche soils have a mollic epipedon and are on a similar landform.
- Wyick soils remain saturated in the upper argillic horizon and are on flats on the coastal plains.

Soil Description

Raisin

Landscape: Inland dissected coastal plains
Landforms: High stream terraces
Geomorphic positions, three-dimensional: Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical Profile

A—0 to 11 inches; neutral fine sandy loam
Bt1—11 to 20 inches; slightly acid sandy clay loam
Bt2—20 to 35 inches; neutral sandy clay loam
Btk—35 to 80 inches; slightly alkaline sandy clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: 9 to 18 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.9 inches (High)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2c
Ecological site name: Sandy Loam 25-35" PZ
Ecological site number: R083AY407TX
Typical vegetation: Not assigned

RoA—Realitos clay, 0 to 1 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Realitos and similar soils: 90 percent
Contrasting soils: 10 percent

- Clareville soils that have a loamy surface texture and are on a toeslope position on a hillslope landform.
- Tiocano soils remain ponded for longer periods.

Soil Description

Realitos

Landscape: Inland, dissected coastal plains
Landforms: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium over loamy alluvium

Typical Profile

A—0 to 6 inches; neutral clay
Bw—6 to 23 inches; slightly alkaline clay
Bss—23 to 75 inches; slightly alkaline clay
BCk—75 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.0 inches (High)
Natural drainage class: Somewhat poorly drained
Runoff: Negligible
Flooding frequency: None
Ponding frequency: Occasional
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3w
Ecological site name: Lakebed 20-35" PZ
Ecological site number: R083CY461TX
Typical vegetation: Native woody species include mesquite, sugar hackberry, retama, and huisache. Native grass species include spike lovegrass, Hartweg's paspalum, white triden, switchgrass, knotgrass bristlegrass, buffalograss, and sedge.

RsC—Rhymes fine sand, 1 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

R*hymes and similar soils:* 95 percent
Contrasting soils: 5 percent

- Areas that do not have argillic horizon within 203 centimeters (80 inches) of the soil surface.
- Nusil soils have a sandy surface layer less than 102 centimeters (40 inches) thick.

Soil Description

Rhymes

Landscape: River valleys, coastal plains
Landforms: Stream terraces (fig. 21)
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Eolian sands over loamy alluvium

Typical Profile

A—0 to 10 inches; neutral fine sand
E—10 to 64 inches; neutral fine sand
Bt—64 to 80 inches; neutral sandy clay loam

Properties and Qualities

Slope: 1 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 6.0 to 20 in/hr (Rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 4.7 inches (Low)
Natural drainage class: Excessively drained
Runoff: Negligible
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Figure 21.—A terrace of Rhymes fine sand. 1 to 5 percent slopes. The foreground is covered with doveweed, also known as wooly croton. Wooly croton provides cover, shade, and seeds for doves and other birds. The Rhymes soils are in the Sandy ecological site.

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Sandy 20-35" PZ (fig. 21)
Ecological site number: R083AY406TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

RuB—Runge fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Runge and similar soils: 95 percent
Contrasting soils: 5 percent

- Ander soils have a clayey argillic horizon and are on a similar landform.
- Raisin soils do not have a mollic epipedon and are on a similar landform.
- Tiocano soils are clayey, in depressions, and remain ponded for long periods.
- Weesatche soils have secondary carbonates within 91 centimeters (36 inches) of the soil surface.

Soil Description

Runge

Landscape: Inland, dissected coastal plains
Landforms: Hillslopes
Geomorphic positions, two-dimensional: Footslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 14 inches; neutral fine sandy loam
Bt—14 to 51 inches; neutral sandy clay loam
Btk—51 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.7 inches (High)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Sandy Loam 25-35" PZ
Ecological site number: R083AY407TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

RyA—Rydolph silty clay, 0 to 1 percent slopes, frequently flooded

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Rydolph and similar soils: 85 percent
Contrasting soils: 15 percent

- Buchel soils are clayey throughout and are on a slightly higher position on a similar landform.
- Meguin soils that do not remain saturated for long periods and are on a slightly higher position on a similar landform.

Soil Description

Rydolph

Landscape: Coastal plains, river valleys
Landforms: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy alluvium of Holocene age

Typical Profile

A—0 to 9 inches; moderately alkaline silty clay
C—9 to 80 inches; moderately alkaline silty clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 9.5 inches (High)
Natural drainage class: Somewhat poorly drained
Runoff: Negligible
Flooding frequency: Frequent
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 5w
Ecological site name: Loamy Bottomland 25-44" PZ
Ecological site number: R150AY534TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

ScB—Sarco coarse sand, 0 to 2 percent slopes

Setting

Major land resource area: 87A—Texas Claypan Area, Southern Part
Map unit prime farmland class: Prime farmland if irrigated

Composition

Sarco and similar soils: 90 percent
Contrasting soils: 10 percent

- Edroy soils are clayey and are in enclosed depressions.
- Greta soils have a loamy surface texture, have increased salinity, and are on flats on the coastal plains.
- Vidauri soils have a loamy surface texture and are on slightly depressional flats on the coastal plains.
- Wyick soils have a loamy surface texture and are on a slight rise on the coastal plains.

Soil Description

Sarco

Landscape: Inland, dissected coastal plains
Landforms: Wooded stream terraces
Geomorphic positions, three-dimensional: Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical Profile

A—0 to 5 inches; slightly acid coarse sand
E—5 to 12 inches; slightly acid coarse sand
Bt1—12 to 20 inches; strongly acid sandy clay loam
Bt2—20 to 32 inches; strongly acid sandy clay loam
Btk—32 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 2 percent
Depth to first restrictive layer: 10 to 14 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 8.3 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: Medium
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Claypan Savannah 28-40" PZ
Ecological site number: R087AY221TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

SnC—Sarnosa fine sandy loam, 1 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Prime farmland if irrigated

Composition

Sarnosa and similar soils: 95 percent
Contrasting soils: 5 percent

- Colibro soils do not have a mollic epipedon and are on a similar landform.
- Pernitas soils have an argillic horizon and are on a similar landform.

Soil Description

Sarnosa

Landscape: Inland, dissected coastal plains
Landforms: Hillslopes
Geomorphic positions, two-dimensional: Shoulder
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 11 inches; moderately alkaline fine sandy loam
Bw—11 to 37 inches; moderately alkaline fine sandy loam
Bk—37 to 80 inches; moderately alkaline fine sandy loam

Properties and Qualities

Slope: 1 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 6.9 inches (Moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Gray Sandy Loam 25-35" PZ
Ecological site number: R083AY389TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

SnD—Sarnosa fine sandy loam, 5 to 8 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Sarnosa and similar soils: 95 percent
Contrasting soils: 5 percent

- Colibro soils do not have a mollic epipedon and are on a similar landform.

Soil Description

Sarnosa

Landscape: Inland, dissected coastal plains
Landforms: Hillslopes
Geomorphic positions, two-dimensional: Shoulder
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 7 inches; moderately alkaline fine sandy loam
Bk1—7 to 29 inches; moderately alkaline fine sandy loam
Bk2—29 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 5 to 8 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 6.6 inches (Moderate)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Gray Sandy Loam 25-35" PZ
Ecological site number: R083AY389TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

StC—Schattel sandy clay loam, 1 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Prime farmland if irrigated

Composition

Schattel and similar soils: 85 percent
Contrasting soils: 15 percent

- Coy soils have a mollic epipedon and are on a similar landform.
- Monteola soils are clayey throughout, have a mollic epipedon, and are on a similar landform.

Soil Description

Schattel

Landscape: Inland, dissected coastal plains
Landforms: Hillslopes
Geomorphic positions, two-dimensional: Shoulder
Geomorphic positions, three-dimensional: Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Clayey residuum weathered from shale

Typical Profile

A—0 to 13 inches; moderately alkaline sandy clay loam
Bk—13 to 39 inches; moderately alkaline clay
Bky—39 to 52 inches; moderately alkaline clay
BCky—52 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 1 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 6.3 inches (Moderate)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Sloping Clay Loam 20-35" PZ
Ecological site number: R083AY626TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

SwA—Sinton sandy clay loam, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Sinton and similar soils: 95 percent
Contrasting soils: 5 percent

- Buchel soils are clayey throughout and are on a slightly lower position on a similar landform.
- Meguin soils have less sand coarser than loamy fine sand and are on a similar landform.

Soil Description

Sinton

Landscape: River valleys
Landforms: Crevasse fillings
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical Profile

A1—0 to 17 inches; moderately alkaline sandy clay loam
A2—17 to 41 inches; moderately alkaline sandy clay loam
Bw—41 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 10.8 inches (High)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Occasional
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 1
Ecological site name: Loamy Bottomland 25-35" PZ
Ecological site number: R083AY573TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

TeA—Telferner fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Telferner and similar soils: 90 percent
Contrasting soils: 10 percent

- Cieno soils are in enclosed depressions and remain ponded for long periods.

- Edna soils have a surface layer less 25 centimeters (10 inches) thick and are on a slightly lower position on a similar landform.

Soil Description

Telferner

Landscape: Coastal plains
Landforms: Ancient meander scrolls
Geomorphic positions, three-dimensional: Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits of late Pleistocene age

Typical Profile

A—0 to 9 inches; slightly acid fine sandy loam
Bt—9 to 29 inches; neutral sandy clay
Btk—29 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 6 to 29 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.5 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Loamy Prairie 44-56" PZ
Ecological site number: R150AY741TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

TeB—Telferner fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Telferner and similar soils: 95 percent
Contrasting soils: 5 percent

- Cieno soils are in enclosed depressions and remain ponded for long periods.
- Faddin soils have a mollic epipedon and are on a similar landform.

Soil Description

Telferner

Landscape: Coastal plains
Landforms: Old meander scrolls
Geomorphic positions, three-dimensional: Rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits of late Pleistocene age

Typical Profile

A—0 to 12 inches; slightly acid fine sandy loam
Bt—12 to 40 inches; neutral sandy clay
Btk—40 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: 6 to 29 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.6 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: Very high
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Loamy Prairie 44-56" PZ
Ecological site number: R150AY741TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

ToA—Tiocano clay, 0 to 1 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Tiocano and similar soils: 85 percent
Contrasting soils: 15 percent

- Clareville soils have a loamy surface texture, are well drained, and are along minor drainageways.
- Realitos soils do not pond for long periods.

Soil Description

Tiocano

Landscape: Inland, dissected coastal plains
Landforms: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium over loamy alluvium

Typical Profile

A—0 to 9 inches; neutral clay
Bss—9 to 34 inches; moderately alkaline clay
BCk—34 to 67 inches; moderately alkaline sandy clay
2Ck—67 to 80 inches; moderately alkaline fine sandy loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.0 inches (High)
Natural drainage class: Somewhat poorly drained
Runoff: Negligible
Flooding frequency: None
Ponding frequency: Occasional
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4w
Ecological site name: Lakebed 20-35" PZ
Ecological site number: R083AY394TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

UsB—Ustarents, loamy, 0 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Ustarents and similar soils: 95 percent
Contrasting soils: 5 percent

- Small areas have not been disturbed by anthroprogenic processes and are similar to soils in adjacently mapped areas.

Soil Description

Ustarents

Landscape: Inland, dissected coastal plains
Parent material: Mine spoil or earthy fill

Typical Profile

A—0 to 6 inches; slightly alkaline sandy clay loam
C—6 to 60 inches; slightly alkaline sandy clay loam

Properties and Qualities

Slope: 2 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.0 inches (High)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Not assigned
Ecological site number: Not assigned
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

VdA—Vidauri fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Vidauri and similar soils: 85 percent
Contrasting soils: 15 percent

- Edroy soils are clayey and remain ponded.
- Greta soils have higher salinity levels and are on a slightly higher position on a similar landform.
- Wyick soils are moderately well drained and are on a slightly higher position on a similar landform.

Soil Description

Vidauri

Landscape: Coastal plains
Landforms: Weakly, defined drainageways
Geomorphic positions, three-dimensional: Talf, dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy fluviomarine deposits

Typical Profile

A—0 to 4 inches; moderately acid fine sandy loam
Bt—4 to 41 inches; slightly acid clay loam
Btk—41 to 49 inches; moderately alkaline sandy clay loam
Btkn—49 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 3 to 7 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.6 inches (Moderate)
Natural drainage class: Somewhat poorly drained
Runoff: Negligible
Flooding frequency: None
Ponding frequency: Occasional
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4w
Ecological site name: Claypan Prairie 28-44" PZ
Ecological site number: R150AY528TX
Typical vegetation: Range grasses are bluestem, paspalums, panicum, rushes, and sedges.

VwA—Vidauri-Wyick complex, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Vidauri and similar soils: 55 percent
Wyick and similar soils: 40 percent
Contrasting soils: 5 percent

- Greta soils have higher salinity levels and are on a slightly higher position on a similar landform.
- Edroy soils are clayey and remain ponded.
- Inari soils have a mollic epipedon and are on a rise on coastal plains.

Soil Description

Vidauri

Landscape: Coastal plains
Landforms: Weakly, defined drainageways
Geomorphic positions, three-dimensional: Talf, dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy fluviomarine deposits

Typical Profile

A—0 to 4 inches; moderately acid fine sandy loam
Bt—4 to 34 inches; slightly acid clay loam
Btk—34 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 3 to 7 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.5 inches (Moderate)
Natural drainage class: Somewhat poorly drained
Runoff: Negligible
Flooding frequency: None
Ponding frequency: Occasional
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4w
Ecological site name: Claypan Prairie 28-44" PZ
Ecological site number: R150AY528TX
Typical vegetation: Range grasses are bluestem, paspalums, panicum, rushes, and sedges.

Wyick

Landscape: Coastal plains
Landforms: Flats
Geomorphic positions, three-dimensional: Talf
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits

Typical Profile

A—0 to 9 inches; moderately acid fine sandy loam
Bt1—9 to 15 inches; strongly acid sandy clay
Bt2—15 to 34 inches; neutral sandy clay loam
Btk—34 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 7 to 12 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 7.1 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3w
Ecological site name: Claypan Prairie 28-44" PZ
Ecological site number: R150AY528TX
Typical vegetation: Range grasses are bluestem and paspalums. Other vegetation includes upland forbs and shrubs.

W—Water

This map unit includes rivers, streams, lakes, and ponds. These areas are covered with water in most years, at least during the period that is warm enough for plants to grow. Many areas are covered with water year-round.

WcC—Weesatche fine sandy loam, 2 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Weesatche and similar soils: 85 percent
Contrasting soils: 15 percent

- Ander soils have a clayey argillic horizon and are on a slightly lower position on a similar landform.
- Pernitas soils are calcareous to the surface and are on a similar landform.
- Raisin soils do not have a mollic epipedon and are on a similar landform.

Soil Description

Weesatche

Landscape: Inland, dissected coastal plains
Landforms: Hillslopes
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy residuum weathered from sandstone

Typical Profile

A—0 to 10 inches; neutral fine sandy loam
Bt—10 to 50 inches; slightly alkaline sandy clay loam
Btk—50 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 2 to 5 percent
Depth to first restrictive layer: 8 to 12 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.8 inches (High)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Sandy Loam 25-35" PZ
Ecological site number: R083AY407TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

WeA—Weesatche sandy clay loam, 0 to 1 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Weesatche and similar soils: 90 percent
Contrasting soils: 10 percent

- Ander soils have a clayey argillic horizon and are on a slightly lower position on a similar landform.
- Clareville soils have a clayey argillic horizon and are along drainageways.
- Tiocano soils are clayey and remain ponded for long periods.

Soil Description

Weesatche

Landscape: Inland, dissected coastal plains
Landforms: Paleoterraces
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy residuum weathered from sandstone

Typical Profile

A—0 to 9 inches; neutral sandy clay loam
Bt—9 to 27 inches; moderately alkaline sandy clay loam
Btk—27 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.9 inches (Moderate)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 1
Ecological site name: Clay Loam 25-35" PZ
Ecological site number: R083AY629TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

WeB—Weesatche sandy clay loam, 1 to 3 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Weesatche and similar soils: 95 percent
Contrasting soils: 5 percent

- Ander soils have a clayey argillic horizon and are on a slightly lower position on a similar landform.
- Goliad soils have a petrocalcic horizon and are on a similar landform.
- Tiocano soils are clayey and remain ponded for long periods.

Soil Description

Weesatche

Landscape: Inland, dissected coastal plains
Landforms: Paleoterraces
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy residuum weathered from sandstone

Typical Profile

A—0 to 5 inches; slightly alkaline sandy clay loam
Bt—5 to 28 inches; slightly alkaline sandy clay loam
Bk—28 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.0 inches (High)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Clay Loam 25-35" PZ
Ecological site number: R083AY629TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

WeB2—Weesatche sandy clay loam, 1 to 3 percent slopes, moderately eroded

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Weesatche e*roded and similar soils:* 95 percent
Contrasting soils: 5 percent

- Pernitas soils are calcareous to the surface and are on a similar landform.
- Raisin soils do not have a mollic epipedon and are on a similar landform.

Soil Description

Weesatche, eroded

Landscape: Inland, dissected coastal plains
Landforms: Hills
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy residuum weathered from sandstone

Typical Profile

A—0 to 6 inches; slightly alkaline sandy clay loam
Bt—6 to 25 inches; moderately alkaline clay loam
Bk—25 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.9 inches (Moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Clay Loam 25-35" PZ
Ecological site number: R083AY629TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

WeC—Weesatche sandy clay loam, 3 to 5 percent slopes

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: All areas are prime farmland

Composition

Weesatche and similar soils: 95 percent
Contrasting soils: 5 percent

- Pernitas soils are calcareous to the surface and are on a similar landform.
- Raisin soils do not have a mollic epipedon and are on a similar landform.

Soil Description

Weesatche

Landscape: Inland, dissected coastal plains
Landforms: Paleoterraces
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 7 inches; slightly alkaline sandy clay loam
Bt—7 to 33 inches; slightly alkaline sandy clay loam
Bk—33 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 3 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.2 inches (High)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Clay Loam 25-35" PZ
Ecological site number: R083AY629TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

WoA—Woodsboro loam, 0 to 1 percent slopes, rarely flooded

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Woodsboro and similar soils: 95 percent
Contrasting soils: 5 percent

- Wyick soils are moderately well drained and are on a slightly higher position on a similar landform.
- Vidauri soils are somewhat poorly drained and are along poorly defined drainageways on coastal plains.

Soil Description

Woodsboro

Landscape: Flat coastal plains
Landforms: Drainageways
Geomorphic positions, three-dimensional: Talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy fluviomarine deposits of Pleistocene age

Typical Profile

A—0 to 6 inches; slightly alkaline loam
Btng—6 to 32 inches; slightly alkaline clay
Btkn1—32 to 38 inches; moderately alkaline sandy clay loam
Btkn2—38 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 3 to 9 inches; Natric
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Saline
Salinity, maximum within 40 inches: Saline
Sodicity, representative within 40 inches: Sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 1.0 inches (Very low)
Natural drainage class: Poorly drained
Runoff: High
Flooding frequency: Rare
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Salty Prairie 25-35" PZ
Ecological site number: R150AY540TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

WyA—Wyick fine sandy loam, 0 to 1 percent slopes

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Prime farmland if irrigated

Composition

Wyick and similar soils: 85 percent
Contrasting soils: 15 percent

- Greta soils have higher salinity levels and are on a slightly higher position on a similar landform.
- Edroy soils are clayey and remain ponded.
- Inari soils have a mollic epipedon and are on a rise on coastal plains.

Soil Description

Wyick

Landscape: Coastal plains
Landforms: Flats
Geomorphic positions, three-dimensional: Talf
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy fluviomarine deposits

Figure 22.—Prairie vegetation on an area of Wyick fine sandy loam, 0 to 1 percent slopes. Wyick soils are in the Claypan Prairie ecological site on the Gulf Coast Prairies.

Typical Profile

A—0 to 6 inches; moderately acid fine sandy loam
Bt1—6 to 12 inches; strongly acid sandy clay
Bt2—12 to 30 inches; neutral sandy clay loam
Btk—30 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: 4 to 8 inches; abrupt textural change
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 7.0 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: High
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: Present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3w
Ecological site name: Claypan Prairie 28-44" PZ (fig. 22)

Ecological site number: R150AY528TX
Typical vegetation: Range grasses are bluestem and paspalums. Other vegetation includes upland forbs and shrubs

ZaA—Zalco sand, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Zalco and similar soils: 95 percent
Contrasting soils: 5 percent

- Small areas of Riverwash and are on the creek or stream bed.

Soil Description

Zalco

Landscape: River valleys, coastal plains
Landforms: Levees
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical Profile

A—0 to 10 inches; moderately alkaline sand
C—10 to 80 inches; moderately alkaline sand

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 6.0 to 20 in/hr (Rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 4.8 inches (Low)
Natural drainage class: Somewhat excessively drained
Runoff: Negligible
Flooding frequency: Occasional
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Sandy Bottomland 35-42" PZ
Ecological site number: R150AY541TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

ZcA—Zalco sand, 0 to 1 percent slopes, frequently flooded

Setting

Major land resource area: 150A—Gulf Coast Prairies
Map unit prime farmland class: Not prime farmland

Composition

Zalco and similar soils: 95 percent
Contrasting soils: 5 percent

- Miscellaneous areas of Riverwash and are on the creek or stream bed.

Soil Description

Zalco

Landscape: River valleys, coastal plains
Landforms: Levees
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy alluvium

Typical Profile

A—0 to 6 inches; moderately alkaline sand
C—6 to 80 inches; moderately alkaline fine sand

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 6.0 to 20 in/hr (Rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 4.8 inches (Low)
Natural drainage class: Somewhat excessively drained
Runoff: Negligible
Flooding frequency: Frequent
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3w
Ecological site name: Sandy Bottomland 35-42" PZ
Ecological site number: R150AY541TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

ZkA—Zunker fine sandy loam, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Zunker and similar soils: 85 percent
Contrasting soils: 15 percent

- Buchel soils are clayey throughout and are on a slightly lower position on a similar landform.
- Meguin soils have a mollic epipedon and are on a similar landform.
- Odem soils are noncalcareous to the surface and are on a natural levee.
- Sinton soils have a mollic epipedon, more clay throughout, and are on a similar landform.

Soil Description

Zunker

Landscape: River valleys, coastal plains
Landforms: Crevasse fillings
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical Profile

A—0 to 12 inches; moderately alkaline fine sandy loam
Bw—12 to 77 inches; moderately alkaline loamy fine sand
Ab—77 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (Moderately rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 6.8 inches (Moderate)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Occasional
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Loamy Bottomland 25-35" PZ
Ecological site number: R083AY573TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

ZnA—Zunker fine sandy loam, 0 to 1 percent slopes, frequently flooded

Setting

Major land resource area: 83A—Northern Rio Grande Plain
Map unit prime farmland class: Not prime farmland

Composition

Zunker and similar soils: 90 percent
Contrasting soils: 10 percent

- Buchel soils are clayey throughout and are on a slightly lower position on a similar landform.
- Meguin soils have a mollic epipedon, more clay throughout, and are on a similar landform.

Soil Description

Zunker

Landscape: Coastal plains, river valleys
Landforms: Crevasse fillings
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical Profile

A—0 to 9 inches; moderately alkaline fine sandy loam
Bw—9 to 26 inches; moderately alkaline loamy fine sand
Ab—26 to 80 inches; moderately alkaline fine sandy loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (Moderately rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.5 inches (Moderate)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Frequent
Ponding frequency: None
Depth to seasonal water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3w
Ecological site name: Loamy Bottomland 25-35" PZ
Ecological site number: R083AY573TX
Typical vegetation: Trees include hackberry and anaqua trees, with few scattered invading mesquite and huisache trees. Range grasses are little bluestem, balsamscale, sideoats grama, knotroot panicum, and threeawn.

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 Conservation Service.

About 392,735 acres in the survey area or nearly 71 percent of the total acreage meets the soil requirements for prime farmland. It is located throughout the county. Most of the acreage is used for cultivated crops, improved pasture, and rangeland.

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 more erodible, droughty, and less productive and cannot be easily cultivated.

The map units that make up the prime farmland in Goliad County are listed in table 8. 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, wetness, and droughtiness, 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 7. The location is shown on the detailed soil maps. 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, doughtiness, 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 forestland; 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 bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

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

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both descriptive and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *not suited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

Stacey A. Kloesel, soil scientist, Natural Resources Conservation Service, helped prepare this section

In Goliad County, about 5 percent or 27,476 acres of the land is devoted to cropland and pasture.

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

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

Crops

About 8,527 acres in the county is cropland. Some areas are irrigated. Many areas of cropland have been converted to pasture or allowed to be overgrown with invasive species, such as huisache, retama, and mesquite.

The major crops are corn, cotton, grain sorghum, wheat, and soybeans (fig. 23).

On all cropland, soil and water conservation are important concerns. Where slopes exceed 1 percent, erosion by water becomes a problem. Soils that are susceptible to water erosion include the Coy, Monteola, Papalote, Raisin, and Weesatche soils.

Figure 23.—Cotton is only grown in a few areas of Goliad County. This field is on an area of Dacosta sandy clay loam, 0 to 1 percent slopes.

Water erosion of the soil surface results in reduced productivity.

Soils with a clayey subsoil or root restrictive layer below the surface are susceptible to water erosion. The Ander and Papalote soils have clayey subsoil. Those soils with a root restrictive layer below the surface include Olmedo, Parrita, and Goliad. Loss of topsoil is also damaging to soils that have a layer in or below the subsoil that restricts rooting depth, such as the Olmedo, Parrita, and Goliad soils, which have a layer of cemented caliche. In many areas of sloping soils, tilling or preparing a good seedbed is difficult if the soils have a claypan or hardpan, which is often the result of the original topsoil being lost. Claypans and hardpans can be common in Papalote, Sarco, and Wyick soils

Farming practices, such as crop residue use, conservation tillage, contour farming, using cover and green manure crops, terraces, diversions, waterways, and crop rotation help control the rate of runoff and reduce erosion by holding rainfall on the land so it can be absorbed by the soil. These practices also help conserve soil moisture and maintain tilth. With proper management, these practices generally result in higher sustained crop yields.

Crop residue maintained on the surface protects the soil against wind and water erosion. It also reduces soil crusting, thereby decreasing water runoff and water erosion. Where slopes are short and irregular, cropping systems providing substantial surface cover are often the most feasible means to control water erosion. Examples of soils with short, irregular slopes include the Coy, Monteola, Pernitas, and Weesatche soils. Additional benefits of using crop residue include reduced evaporation of soil moisture, improved tilth of the surface layer, and reduced compaction of subsurface layers by farm machinery. Soils that develop crusts and are susceptible to wind erosion include the Dacosta and Weesatche soils. In addition, sandy surfaced soils are susceptible to wind erosion. The Milby, Nusil, Raisin, Rhymes, and Kuy soils are examples.

Tillage should be sufficient to prepare a good seedbed and control weeds without damaging the structure of the soil. Heavy traffic on the soil, especially when it is wet, causes a compaction zone to form by altering soil structure and reducing porosity. The Buchel, Coy, Dacosta, Laewest, and Monteola soils are susceptible to the formation of compaction zones. Compaction restricts root growth into and through the compacted layer. This limits the ability of the crop's root system to take up moisture and nutrients. Compaction increases the loss of moisture and nutrients through water runoff and water erosion. It also decreases yields. Crop residue management, crop rotation, conservation tillage, deep chiseling, and controlling traffic patterns are practices that help reduce soil compaction problems.

The proper use of fertilizer is important on all cultivated soils. Soil analyses and knowledge of the fertilizer application history of a field are needed to accurately estimate the kinds and amounts of nutrients needed to produce a specific crop yield.

Specific soils can have unique problems related to soil chemistry and fertility. Crops grown on the Colibro, Pernitas, Pettus, and Sarnosa soils often exhibit chlorosis or yellowing of the leaves because of high levels of calcium carbonate. In severe cases, the affected plants will die. An annual soil analysis can detect a buildup or depletion of required amendments for the specific crop and needed adjustments can be made.

In addition, plant tissue analyses can be used to determine nutrient deficiencies in a growing crop. In some instances, use of better adapted crops and crop rotations can prove beneficial in dealing with imbalances in soil nutrient levels.

Some soils are not suitable for growing most crops because of wetness. These soils remain ponded or have a saturated zone for long periods during normal rainfall years. The Cieno, Edroy, and Tiocano soils are examples of ponded soils. The Vidauri soils have a saturated zone during the fall and spring months.

Pasture and Hayland

Pasture and hayland (fig. 24) consists of perennial grasses used for forage. In Goliad County, pasture and hayland make up about 47,000 acres. Some areas are irrigated.

Pasture and hayland management includes choosing plants adapted to the soil, fertilizing, rotating pastures for grazing, and using weed and brush control. Irrigation water management is important where pasture or hayland is irrigated.

Many grasses producing high forage yields are adapted for improved pasture. The most widely used grasses are kleingrass, common and improved bermudagrass, King Ranch bluestem, other improved bluestem, Bell rhodesgrass, johnsongrass, and Wilman lovegrass. The improved bermudagrasses (fig. 25) are the most widely used and some pastures and hay fields are irrigated.

Application of commercial fertilizer or the interseeding of soil-improving legumes is essential for economical production of forage on pasture and hayland. Fertilizer should be applied on non-irrigated pasture when moisture is adequate. All fertilizer should be applied according to need as indicated by soil or plant analysis.

Rotational grazing of pastures is an important practice. Timely rotation allows for maximum returns controlled by mowing, prescribed burning, or by treating with approved herbicides.

Figure 24.—Good quality hay will provide nutrition for livestock in the winter. This field is on an area of Weesatche sandy clay loam, 1 to 3 percent slopes.

Figure 25.—Coastal bermudagrass on an area of Kuy fine sand, 1 to 3 percent slopes. These soils will yield good quality hay if sufficient rainfall occurs through the growing period. Kuy soils can be droughty if sufficient precipitation is not available.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in Table 9. 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 map units in the survey area 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 also are considered.

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

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 9 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 Texas AgriLife Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA SCS, 1961).

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to Pasture and rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to Pasture and rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

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, 2e. 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 and rangeland, forestland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section”Detailed Soil Map Units” and in Table 9.

Rangeland

Stacey A. Kloesel, soil scientist, Natural Resources Conservation Service, helped prepare this section.

Rangeland is the land on which the native vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. In areas that have similar climate and topography, the kind and amount of vegetation produced are closely related to the kind of soil. Effective management is based on the relationship of soils, vegetation, and water. Rangeland or native grassland receives no regular or frequent cultural treatment, such as fertilizer or tillage.

About 514,014 acres or 95 percent of Goliad County is classified as rangeland. The rangeland in Goliad County is located within two major land resources (MLRA), Northern Rio Grande Plains and Gulf Coast Prairies. Soils of the Northern Rio Grande Plains MLRA are generally very deep, with a few areas along hilltop ridges that are shallow. Most of these soils have a loamy surface and loamy subsoil and are well drained. The topography of this MLRA is characterized by low hills and rolling plains. Soils of the Gulf Coast Prairies are very deep and have a slightly acidic loamy surface and neutral to alkaline clayey subsoil. Some areas are clayey throughout. The topography is generally flat.

Few ranchers depend exclusively on rangeland to feed livestock. Although range vegetation often contributes significant amounts of forage during winter months, it is supplemented by protein concentrates and small-grain pasture. True native vegetation in most of the county is in small blocks of less than 100 acres, but some blocks are as large as several thousand acres. Forage productivity has been depleted in most of these areas because of past management practices that allowed the invasion of woody or weedy vegetation. These areas have plant species of reduced quality and quantity for suitable forage plants. Many areas listed as rangeland are land that is abandoned cropland or pasture. In any area of rangeland that has not been managed properly production is much less than the original potential. Most of the rangeland is in poor to fair condition. Some of the dominant grasses are Texas wintergrass, sideoats grama, windmillgrass species, threeawn, little bluestem and some introduced species such as King Ranch bluestem, which have invaded or survived prior management.

Ecological Sites

An ecological site for rangeland 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 (a characteristic plant community). 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 electronic "Field Office Technical Guide, (eFOTG)" which is available online at http://www.nrcs.usda.gov/technical/efotg, can provide specific information about ecological sites.

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.

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 been degraded significantly and proper grazing management is implemented, native plants can return.

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 a comparison of the present plant community to the historic climax plant community. A similarity index is the percentage, by weight, of historic climax plant community that is found in the present plant community. This index provides an indication of past disturbance as well as potential for improvement. Further information about range similarity index is available in the "National Range and Pasture Handbook" on line at http://www.glti.nrcs.usda.gov.

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 landowners 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 soil and site stability, hydrologic function, and biotic integrity.

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.

Following years of prolonged overuse of range, seed sources of desirable vegetation will be eliminated. In such instances, vegetation can be reestablished by applying one or a combination of the following practices: mechanical or chemical treatment, range planting, fencing, water development, prescribed burning, or other treatments to revitalize stands of native plants. Thereafter, deferred grazing, proper grazing use, and planned grazing systems must be applied to maintain and improve the range. The implementation of physical practices must be followed by grazing management and follow-up brush control for maintenance purposes. The combination of alternatives, or Resource Management Systems (RMS), is essential if rangeland productivity is to be maintained. Following are some of the more commonly used resource management practices.

The rangeland in Goliad County is located within three Major Land Resource Areas (MLRA's). They are the MLRA 83A—Northern Rio Grande Plain, MLRA 87A—Texas Claypan Savannah, and MLRA 150A—Gulf Coast Prairies. The following are descriptions of the ecological sites in Goliad County.

MLRA 83A—Northern Rio Grande Plain

Blackland ecological site. This site includes soil mapping units: EnB—Elmendorf-Denhawken complex, 1 to 3 percent slopes; and MoA—Monteola clay, 0 to 1 percent slopes.

The climax plant community is an open grassland prairie. A few large live oaks, elm, and hackberry trees are along drainageways and in motts. The composition by weight is 95 percent grasses and 5 percent forbs. Annual production ranges from

3,800 pounds per acre in below average production years to 5,500 pounds per acre in above average production.

This ecological site has high natural fertility. In climax stage, little bluestem, indiangrass, and fourflower trichloris produce almost half of the forage. Other grasses, such as Arizona cottontop, sideoats grama, Texas wintergrass, Texas cupgrass, tall dropseed, pinhole bluestem, vine-mesquite, and plains bristlegrass produce the rest. Many palatable forbs and legumes are native to the site.

Overgrazing by cattle eventually kills out the tall and mid grasses, such as fourflower trichloris, indiangrass, sideoats grama, and little bluestem. These are replaced by mid grasses, such as silver bluestem, Texas wintergrass, Nash windmillgrass, pink pappusgrass, and tall dropseed. If overgrazing continues, buffalograss, Texas grama, tumblegrass, purple and red threeawn, red lovegrass, whorled dropseed, annual weeds and annual grasses invade the site along with noxious brush species, such as mesquite, spiny hackberry, Retama, algerita, lotebush, and huisache.

Clayey Bottomland ecological site. This site includes soil mapping units: BsA—Buchel clay, 0 to 1 percent slopes, occasionally flooded; and BuA—Buchel clay, 0 to 1 percent slopes, frequently flooded.

The climax plant community is a tall grass savannah. Oak, elm, hackberry, cottonwood, ash, black willow, some pecan, and other large trees make up about one-fourth of the canopy cover. The canopy is generally heavier along streams or drainageways. Cool-season grasses and sedges grow under the canopy, and warm-season grasses and forbs dominate the open areas. The composition by weight is 85 percent grasses, 10 percent woody plants, and 5 percent forbs. Annual production ranges from 4,500 pounds per acre in below average production years to 8,000 pounds per acre in above average production years.

The dominant grasses are little bluestem, switchgrass, indiangrass, fourflowered trichloris, and giant sacaton. They comprise about one-third of the total grass composition, followed by Virginia wildrye, Canada wildrye, southwestern bristlegrass, and rustyseed paspalum. Vine-mesquite, buffalograss, long leaf uniola, knotroot bristlegrass, and other low panicum and paspalum are present in lesser amounts. The forbs are Englemann daisy, snoutbean, lespedeza, and western indigo.

This ecological site is preferred by livestock. The warm-season grasses and forbs are reduced when the site is grazed heavily and fire is suppressed, allowing the brush to form a dense canopy. Shade-tolerant grasses then dominate the understory and total usable forage is drastically reduced. Bushy bluestem, ragweed, sumpweed, spiny aster, and annual grasses and forbs dominate the site.

Clay Loam ecological site. This site includes soil mapping units: CrA—Clareville sandy clay loam, 0 to 1 percent slopes, rarely flooded; CrB—Clareville sandy clay loam, 1 to 3 percent slopes, rarely flooded; GoB—Goliad sandy clay loam, 1 to 3 percent slopes; WeA—Weesatche sandy clay loam, 0 to 1 percent slopes; WeB—Weesatche sandy clay loam, 1 to 3 percent slopes; WeB2—Weesatche sandy clay loam, 1 to 3 percent slopes, moderately eroded; and WeC—Weesatche sandy clay loam, 3 to 5 percent slopes.

In pristine condition, the Clay Loam site is open grassland with an occasional mesquite tree or woody shrub. The composition by weight is 90 percent grasses, 5 percent woody plants, and 5 percent forbs. Annual production ranges from 3,000 pounds per acre in below average production years to 6,500 pounds per acre in above average production years.

The dominant grasses are little bluestem, twoflowered trichloris, and fourflower trichloris. They constitute about one-third of the total grass composition, followed by pinhole bluestem, silver bluestem, plains bristlegrass, spike bristlegrass, and pink pappusgrass. Sideoats grama, Arizona cottontop, and short grasses make up lesser amounts. Woody plants include spiny hackberry, wolfberry, vine ephedra and condalia. The primary forbs, along with numerous other legumes, are Maximilian sunflower, Englemann daisy, orange zexmenia, and bundleflower.

As retrogression occurs because of overgrazing, tall grasses, such as bluestem, indiangrass, switchgrass, and Florida paspalum, decrease and are replaced by sideoats grama, silver bluestem, low panicum, Texas wintergrass, and tall dropseed. In a deteriorated condition, invader plants, such as threeawn, hairy grama, red lovegrass, Texas grama, buffalograss, tumblegrass, western ragweed, broomweed, and prairie coneflower, and woody plants, such as mesquite, baccharis, yaupon, and hawthorn, dominate the site, reducing the total production potential.

Gravelly Ridge ecological site. This site includes soil mapping units: DeC—Devine very gravelly fine sandy loam, 1 to 5 percent slopes; and PuC—Pettus loam, 2 to 5 percent slopes.

The climax plant community is a semi-open grassland of mid grasses interspersed with low-growing browse plants. Guajillo and blackbrush are the dominant woody plants. Fire is probably a factor in keeping the brush from dominating completely. In climax condition, this site maintains at least a 25 percent brush canopy. The composition by weight is 70 percent grasses, 5 percent forbs, and 25 percent woody plants. Annual production ranges from 1,400 pounds per acre in below average production years to 3,000 pounds per acre in above average production years.

The dominant mid grasses, which make up about half of the total grass composition, are tanglehead, Arizona cottontop, pinhole bluestem, sideoats grama, and green sprangletop. As retrogression occurs, blackbrush and guajillo dominate and threeawn, fall witchgrass, slim triden, red grama, and Texas bristlegrass make up the understory.

With continued overgrazing, further increase in blackbrush and guajillo along with spiny hackberry, guayacan, kidneywood, and other acacia species occur. Cool-season annual forbs and grasses are produced by fall and winter rains.

Gray Sandy Loam ecological site. This site includes soil mapping units: CsC—Colibro sandy clay loam, 3 to 5 percent slopes; CsD—Colibro sandy clay loam, 5 to 12 percent slopes; PtC—Pernitas sandy clay loam, 2 to 5 percent slopes; SnC—Sarnosa fine sandy loam, 1 to 5 percent slopes (fig. 26); and SnD—Sarnosa fine sandy loam, 5 to 8 percent slopes.

The climax plant community is an open grassland with scattered mesquite and underbrush throughout the landscape. The understory is dominated by mid grasses, such as trichloris and plains bristlegrass. The composition by weight is 90 percent grasses, 5 percent woody plants, and 5 percent forbs. Annual production ranges from 2,500 pounds per acre in below average production years to 4,500 pounds per acre in above average production years.

The dominant grasses are twoflowered and fourflowered trichloris. They comprise about one-fifth of the total grass composition, followed by plains bristlegrass, Nash and hooded windmillgrass, and pink pappusgrass. Grasses, such as sideoats grama, green sprangletop, cottontop, buffalograss, sand dropseed, and other perennial mid and short grasses are present in lesser amounts.

As retrogression occurs, whitebrush, blackbrush, mesquite, spiny hackberry, and cactus can form a dense canopy. With continued overuse, the better mid grasses are replaced by invader plants, such as threeawn, croton, sneezeweed, ragweed, tumblegrass, broomweed, and grassbur. Huisache, and introduced species, comes in strongly with overuse.

Lakebed ecological site. This site includes soil mapping units: RoA—Realitos clay, 0 to 1 percent slopes; and ToA—Tiocano clay, 0 to 1 percent slopes.

The climax plant community is open grassland with varying degrees of wetness. These shallow depressed sites vary from 1 to 10 acres in size. The composition by weight is 95 percent grasses and 5 percent forbs. No woody plants are present on

Figure 26.—An area of Sarnosa fine sandy loam, 1 to 5 percent slopes. Sarnosa soils are in the Gray Sandy Loam ecological site.

this site in its climax stage. Annual production ranges from 2,500 pounds per acre in below average production years to 5,000 pounds per acre in above average production years.

The dominant grass is Hartweg paspalum. Other grasses better suited to moist areas include switchgrass, white triden, knotroot bristlegrass, spike lovegrass, and sedges and rushes. These species generally are present in smaller amounts. Buffalograss can appear when the areas are dry for long periods.

As the site is overused, mesquite, huisache, and retama invade and form a dense canopy. Other common invaders include spiny aster, sesbania, bermudagrass, and annual forbs.

Loamy Bottomland ecological site. This site includes soil mapping units: MeA—Meguin silty clay loam, 0 to 1 percent slopes, occasionally flooded (fig. 27); MgA—Meguin silty clay loam, 0 to 1 percent slopes, frequently flooded; the Odem part of OdA—Odem-Riverwash complex, 0 to 1 percent slopes, frequently flooded; SwA—Sinton sandy clay loam, 0 to 1 percent slopes, occasionally flooded; ZkA—Zunker fine sandy loam, 0 to 1 percent slopes, occasionally flooded; and ZnA—Zunker fine sandy loam, 0 to 1 percent slopes, frequently flooded.

The climax plant community is a tall grass savannah. Trees shade about 20 percent of the ground. The overstory consists of oaks, pecan, hackberry, elm, cottonwood, hickory, and ash. The understory is hawthorn, greenbriar, honeysuckle, grapes, and peppervine. Cool-season grasses and sedges dominate the shaded areas. The composition by weight is 80 percent grasses, 15 percent woody plants, and 5 percent forbs. Annual production ranges from 3,475 pounds per acre in below average production years to 6,425 pounds per acre in above average production years.

Figure 27.—Native vegetation on an area of Meguin silty clay loam, 0 to 1 percent slopes, occasionally flooded. Meguin soils are in the Loamy Bottomland ecological site.

The dominant grasses are switchgrass, fourflowered trichloris, big cenchrus, little bluestem, and southwestern bristlegrass. These grasses grow in the open areas and make up most of the plant community, followed by vine-mesquite, sideoats grama, low panicum, pink pappusgrass, buffalograss, plains bristlegrass, and other grasses. Virginia wildrye, Texas wintergrass, sedges, and white triden grow in the shaded and wet areas, and comprise a lesser amount of the total grass composition. The forbs are bundleflower, lespedeza, Englemann daisy, hairy ruellia, partridge pea, and gayfeather.

This site is preferred by livestock. The warm-season grasses and forbs are reduced by overgrazing and fire suppression, which increase the tree and brush canopy. Shade-tolerant grasses and forbs then dominate and forage production is drastically reduced.

Loamy Sand ecological site. This site includes soil mapping units: LmB—Leming loamy fine sand, 0 to 3 percent slopes; PaB—Papalote loamy sand, 0 to 3 percent slopes; RaB—Raisin loamy fine sand, 0 to 3 percent slopes; RaC—Raisin loamy fine sand, 3 to 5 percent slopes; and RaC2—Raisin loamy fine sand, 2 to 5 percent slopes, moderately eroded.

The climax plant community is open grassland. Some mesquite and live oak are present. Tall grasses grow between the oaks. The composition by weight is 85 percent grasses, 10 percent woody plants, and 5 percent forbs. Annual production ranges from 2,000 pounds per acre in below average production years to 4,500 pounds per acre in above average production years.

The dominant grasses on this site are little bluestem, switchgrass, and crinkleawn, followed by brownseed paspalum, tanglehead, and sideoats grama. Other grasses adapted to this site are cottontop, feathery bluestem, spike and plains bristlegrass, hooded windmillgrass, and other low panicum and paspalum.

With overgrazing, this site loses tall and mid grasses, such as bluestem, crinkleawn, and switchgrass. These plants are replaced by many annual forbs, red lovegrass, hairy grama, signalgrass, threeawn, and grassbur. Mesquite, spiny hackberry, pricklypear, and lantana also increase with continued overuse.

Rolling Blackland ecological site. This site includes soil mapping units: CyB—Coy clay loam, 1 to 3 percent slopes; CyC—Coy clay loam, 3 to 5 percent slopes; MoB—Monteola clay, 1 to 3 percent slopes; and MoC—Monteola clay, 3 to 5 percent slopes.

The climax plant community is an open prairie. This site is dominated by mid and short grasses. The composition by weight is 95 percent grasses and 5 percent forbs. Woody plants are present in trace amounts. Annual production ranges from 2,500 pounds per acre in below average production years to 4,000 pounds per acre in above average production years.

The dominant mid and short grasses are sideoats grama, vine-mesquite, bristlegrass species, Texas wintergrass, and Arizona cottontop. Other desirable grasses, present in lesser amounts, are Texas cupgrass, pinhole and silver bluestem, buffalograss, and the trichloris species.

As retrogression occurs, Texas wintergrass, plains bristlegrass, curly mesquite, and buffalograss are likely to increase. With continued deterioration, invader plants, such as red grama, red threeawn, Texas grama, and windmillgrass, can dominate the site. Mesquite, spiny hackberry, whitebrush, algerita, and pricklypear frequently increase or encroach which would eventually dominate the site.

Sandy ecological site. This site includes soil mapping unit: NuC—Nusil fine sand, 1 to 5 percent slopes; and RsC—Rhymes fine sand, 1 to 5 percent slopes.

The climax plant community is open grassland. Mesquite and occasional live oak are scattered over the area. The interspaces are predominantly tall and mid grasses. The composition by weight is 90 percent grasses, 5 percent woody plants, and 5 percent forbs. Annual production ranges from 2,100 pounds per acre in below average production years to 5,250 pounds per acre in above average production years.

The dominant grass is little bluestem, which make up about half of the total grass composition. indiangrass, switchgrass, crinkleawn, tanglehead, fringeleaf paspalum, and brownseed paspalum make up lesser amounts. Other grasses are balsamscale, hooded windmillgrass, tall dropseed, and low panicum. The forbs are western indigo, sensitive briar, snoutbean, partridge pea, and western ragweed. The abundance of forbs makes this a preferred site for dove and quail.

With continuous overgrazing, and the lack of natural fires, the taller grasses are grazed out. Little bluestem, indiangrass, and switchgrass are replaced by brownseed paspalum, tall dropseed, fall witchgrass and other increasing species. They, in turn, are grazed out and replaced by red lovegrass, yankeeweed, bullnettle, snakecotton, and croton. Other invading plants are tumble lovegrass, sandbur, pricklypear, Queen’s delight, beebalm, pricklypoppy, and baccharis.

Sandy Loam ecological site. This site includes soil mapping units: GdB—Goliad fine sandy loam, 1 to 3 percent slopes; RnB—Raisin fine sandy loam, 1 to 3 percent slopes; RuB—Runge fine sandy loam, 1 to 3 percent slopes; and WcC—Weesatche fine sandy loam, 2 to 5 percent slopes.

The climax plant community is open grassland. The site consists of mid and tall grasses and is dominated by little bluestem and twoflowered and fourflowered trichloris. The total composition by weight is 90 percent grasses, 5 percent woody plants, and 5 percent forbs. Annual production ranges from 2,200 pounds per acre in below average production years to 4,400 pounds per acre in above average production years.

Arizona cottontop and feathery bluestem are the next dominant grasses, followed by plains bristlegrass, hooded windmillgrass, and Nash windmillgrass. Numerous other grasses make up lesser amounts. Condalias, blackbrush, and kidneywood are woody shrubs. The forbs include Englemann daisy, gayfeather, sensitive briar, and native legumes.

If wildfires are reduced and overgrazing continues, this range site deteriorates. Woody canopy increases and tall grasses, such as little bluestem, indiangrass, twoflowered and fourflowered trichloris, decline. They are replaced by plants such as brownseed paspalum. If overgrazing persists, the site deteriorates to threeawn, red grama, red lovegrass, annual grasses, forbs, and grassburs. As grass cover is reduced, invader brush, such as mesquite, whitebrush, spiny hackberry, and blackbrush form a dense canopy.

Shallow Ridge ecological site. This site includes soil mapping unit: OmD—Olmedo very gravelly loam, 1 to 8 percent slopes.

The climax plant community is a grassland with scattered, low growing brush, such as guajillo, ceniza, kidneywood, ephedra and mescal bean. Composition by weight for this site is 85 percent grasses, 5 percent forbs, and 10 percent woody plants. Annual production ranges from 1,400 pounds per acre in below average production years to 3,200 pounds in above average production years.

The site is dominated by mid grasses, such as Arizona cottontop, sideoats grama, little bluestem, and green sprangletop. Other mid grasses include trichloris, sand dropseed, and Texas bristlegrass.

As retrogression occurs, slim triden, fall witchgrass, and Nash windmillgrass increase. With further overgrazing and onsite deterioration, invaders such as threeawn, red grama, Texas grama, and tumble windmillgrass increase. Woody invaders include guajillo, ceniza, blackbrush, brazil, lotebush, and acacia species.

Shallow Sandy Loam ecological site. This site includes soil mapping unit: PrB—Parrita sandy clay loam, 0 to 3 percent slopes.

The climax plant community is an open grassland with a few scattered woody plants and many forbs. The composition by weight is 85 percent grasses, 10 percent forbs, and 5 percent woody plants. Annual production ranges from 1,200 pounds per acre in below average production years to 3,700 pounds per acre in above average production years.

The dominant mid grasses are feathery bluestem, tanglehead, cottontop, bristlegrass, and little bluestem. Short grasses, such as fall witchgrass, hooded windmillgrass, sand dropseed, and slim triden are present in lesser amounts.

As retrogression occurs, the mid grasses are replaced by short grasses, which are usually low quality or annuals. Guajillo and blackbrush increase temporarily until further overgrazing causes blackbrush to dominate over guajillo.

Sloping Clay Loam ecological site. This site includes soil mapping unit: StC—Schattel sandy clay loam, 1 to 5 percent slopes.

The climax plant community is as open grassland with a scattering of blackbrush or woody shrubs. Mid grasses are dominant. The site supports climax forbs such as bushsunflower, orange zexmenia, and bundleflower. The climax composition by weight is 90 percent grasses, 5 percent forbs, and 5 percent woody plants. Annual production ranges from 2,000 pounds per acre in below average production years to 3,500 pounds per acre in above average production years.

The dominant mid grasses are pink pappusgrass, Arizona cottontop, sideoats grama, twoflowered trichloris, and bristlegrass. Other mid and short grasses present are Texas wintergrass, plains lovegrass, slim triden, and buffalograss.

This site is slow to recover after the grass cover is removed, leaving a soil crust that retards rainfall. As retrogression occurs, blackbrush, mesquite, and other mixed brush and cacti form a dense canopy. Common grasses in a deteriorated community are red grama, Texas grama, Hall panicum, and threeawn.

Tight Sandy Loam ecological site. This site includes soil mapping units: AnA—Ander fine sandy loam, 0 to 1 percent slopes; AnB—Ander fine sandy loam, 1 to 3 percent slopes; ImA—Imogene fine sandy loam, 0 to 1 percent slopes PbA—Papalote fine sandy loam, 0 to 1 percent slopes; and PbB—Papalote fine sandy loam, 1 to 3 percent slopes.

The climax plant community is an open grassland with scattered mesquite and other woody brush. Mid grasses dominate the site. Climax forbs and legumes grow well on this site. Composition by weight is 90 percent grasses, 5 percent forbs, and 5 percent woody plants. Annual production ranges from 2,000 pounds per acre in below average production years to 4,780 pounds per acre in above average production years.

The dominant mid grasses are sideoats grama, Arizona cottontop, tanglehead, feathery bluestem, and twoflowered trichloris. Other mid and short grasses that occur on this site are plains bristlegrass, Nash and hooded windmillgrass, and pink pappusgrass.

As retrogression occurs, mesquite, condalias, spiny hackberry, and other woody plants form a moderate to dense canopy. Common plants that are found in a deteriorated community are broomweed, croton, cactus, red grama, Texas grama, sandbur, and tallowweed.

MLRA 87A—Texas Claypan Savannah

Claypan Savannah ecological site. This site includes soil mapping unit: ScB—Sarco coarse sand, 0 to 2 percent slopes.

The composition by weight is about 75 percent grasses, 5 percent forbs, and 25 percent trees and shrubs. Annual production ranges from 3,000 pounds per acre in below average production years to 5,000 pounds per acre in above average production years.

About 60 percent of the climax plant community is made up of post oak and blackjack oak savannah, with little bluestem, indiangrass, and purpletop making up the climax plant community.

The dominant mid grasses are sideoats grama, Arizona cottontop, tanglehead, feathery bluestem, and twoflowered trichloris. The dominant mid and short grasses are plains bristlegrass, Nash and hooded windmillgrass, and pink pappusgrass.

As retrogression occurs, mesquite, condalias, spiny hackberry, and other woody plants form a moderate to dense canopy. Common plants that are found in a deteriorated community are broomweed, crotons, cactus, red grama, Texas grama, sandbur, and tallowweed.

MLRA 150A—Gulf Coast Prairies

Blackland ecological site. This site includes soil mapping units: DaA—Dacosta sandy clay loam, 0 to 1 percent slopes; DcA—Dacosta-Contee complex, 0 to 1 percent slopes; LaA—Laewest clay, 0 to 1 percent slopes; LaB—Laewest clay, 1 to 3 percent slopes; and LaD—Laewest clay, 3 to 8 percent slopes, eroded.

The climax plant community is an open tall and mid grass prairie. Historical accounts also report a scattering of few large live oaks, mesquite, and hackberry trees along drainageways and in motts. The composition by weight is 90 percent grasses, 5 percent forbs, and 5 percent shrubs. Annual production ranges from 6,500 pounds per acre in below average production years to 9,500 pounds per acre in above average production.

This ecological site has high natural fertility. In climax stage, big bluestem, Florida paspalum, indiangrass, switchgrass, and eastern gamagrass produce almost half of the forage. Other important mid grasses found in the site include vine mesquite, sideoats grama, brownseed paspalum, little bluestem, large-spike bristlegrass, and tall dropseed. Many palatable forbs and legumes are native to the site such as ragweed, dayflower, prairie clovers, bundleflower, Engelmann daisy, gaura, and indigo.

Overgrazing by cattle eventually kills out the tall and mid grasses, such as big bluestem, Florida paspalum, indiangrass, switchgrass, and eastern gamagrass. These are replaced by mid grasses, such as vine mesquite, sideoats grama, brownseed paspalum, little bluestem, large-spike bristlegrass, and tall dropseed. If overgrazing continues, buffalograss, Texas grama, tumblegrass, purple and red threeawn, red lovegrass, whorled dropseed, annual weeds and grasses invade the site along with noxious brush species, such as mesquite, spiny hackberry, Retama, algerita, lotebush, and huisache.

Claypan Prairie ecological site. This site includes soil mapping units: EbA—Edna fine sandy loam, 0 to 1 percent slopes; VdA—Vidauri fine sandy loam, 0 to 1 percent slopes; VwA—Vidauri-Wyick complex, 0 to 1 percent slopes; and WyA—Wyick fine sandy loam, 0 to 1 percent slopes.

The climax plant community is a true prairie. The composition by weight is about 95 percent grasses and 5 percent forbs. Annual production ranges from 3,400 pounds per acre in below average production years to 6,200 pounds per acre in above average production years.

The dominant grasses are little bluestem, switchgrass, and indiangrass. The other grasses are eastern gamagrass, Florida paspalum, big bluestem, brownseed paspalum, low panicum, low paspalum, longtom, knotroot bristlegrass, and sedges. Forbs include bundleflower, sensitive briar, button snakeroot, yellow neptunia, croton, and ragweed.

If regression occurs, as a result of heavy grazing little bluestem, switchgrass, indiangrass, big bluestem, eastern gamagrass, and Florida paspalum are replaced by brownseed paspalum, low paspalum, low panicum, knotroot bristlegrass, and sedges. If heavy grazing continues for many years, smutgrass, carpetgrass, common bermudagrass, bushybeard bluestem, broomsedge bluestem, vaseygrass, and woody species such as McCartney rose, sennabean, huisache, running live oak, and baccharis increase significantly.

Deep Sand ecological site. This site includes soil mapping unit: KyB—Kuy fine sand, 1 to 3 percent slopes.

The climax plant community is a tall grass, post oak, and live oak savannah with a woody canopy of about 15 percent. The composition by weight is about 80 percent grasses, 15 percent shrubs and trees, and 5 percent forbs. Annual production ranges from 2,000 pounds per acre in below average production years to 4,500 pounds per acre in above average production years.

The dominant grasses are little bluestem and indiangrass. The other grasses are purpletop, southwest bristlegrass, brownseed paspalum, and Pan American balsamscale. Woody plants include post oak and live oak. Forbs include snoutbean, wildbean, prairie-clovers, croton, Englemann daisy, powder puff and tickclover.

If regression occurs, as a result of heavy grazing little bluestem, switchgrass, indiangrass, big bluestem, and Florida paspalum are replaced by windmillgrass, threeawn, fringeleaf paspalum, and Scribners rosettegrass.

Blackjack oak and post oak cohabitat with the live oak, American beautyberry, yaupon, mustang grapes, and poison ivy. If heavy grazing continues for many years, little or no herbaceous production occurs because of lack of sunlight and woody species such as oaks, yaupon, beautyberry, mustang grape, and poison ivy increase significantly.

Lakebed ecological site. This site includes soil mapping unit: EdA—Edroy clay, 0 to 1 percent slopes.

The climax plant community is a mid and tall grass and sedge dominated depressional grassland heavily influenced by water regimes within the depression as well as by grazing and fire. During wet cycles, more wet tolerant species dominated while during dry cycles, species adapted to slightly drier conditions and less ponded water dominated the community. The tall grass species commonly found on the site included eastern gamagrass, Florida paspalum, and switchgrass. Midgrasses and sedges are important species on this site, making up as much as 60 to 70 percent of herbaceous production during wet cycles. These include longtom paspalum, knotroot bristlegrass, green flatsedge, jointed flatsedge, spikerush, and numerous others. Perennial forbs during dry cycles included yellow neptunia, bundleflower, common broomweed, sneezeweed, and wild petunia. Wet cycles caused such species as arrowhead, water clover, dock, and other wet tolerant forbs to become more prevalent.

This site is used primarily for wildlife habitat. Birds, mammals, and reptiles rely on these areas for food, water, and shelter especially during times when these sites have water. Some areas are used as a water source for livestock.

Loamy Bottomland ecological site. This site includes soil mapping unit: RyA—Rydolph silty clay, 0 to 1 percent slopes, frequently flooded.

The climax plant community is a tall grass savannah. Trees shade about 20 percent of the ground. The overstory consists of oaks, pecan, hackberry, elm, cottonwood, and hickory or ash. The understory is hawthorn, greenbriar, honeysuckle, grapes, and peppervine. Cool-season grasses and sedges dominate the shaded areas. The composition by weight is 80 percent grasses, 15 percent woody plants, and 5 percent forbs. Annual production ranges from 3,800 pounds per acre in below average production years to 9,200 pounds per acre in above average production years.

Eastern gamagrass, big bluestem, indiangrass, switchgrass, little bluestem, sensitive briar, snoutbean, ragweed, and wildbean grow in the open areas and make up most of the plant community, followed by sideoats grama, low panicum, triden, silver bluestem, plains bristlegrass, and other grasses. Virginia wildrye, Texas wintergrass, sedges, and white triden grow in the shaded and wet areas, and comprise a lesser amount of the total grass composition. The forbs are bundleflower, lespedeza, Englemann daisy, hairy ruellia, partridge pea, and gayfeather.

This site is preferred by livestock. The warm-season grasses and forbs are reduced by overgrazing and fire suppression, which increase the tree and brush canopy. Shade-tolerant grasses and forbs then dominate and forage production is drastically reduced. Species such as bushy bluestem, rustyseed paspalum, Texas wintergrass, longspike triden, beaked panicum and sedges dominate the degraded site. Forbs such as ragweed and spiny aster replace the desirable forbs.

Loamy Prairie ecological site. This site includes soil mapping units: FdA—Faddin fine sandy loam, 0 to 1 percent slopes; InA—Inari fine sandy loam, 0 to 1 percent slopes; InB—Inari fine sandy loam, 1 to 3 percent slopes; OrA—Orelia fine sandy loam, 0 to 1 percent slopes; TeA—Telferner fine sandy loam, 0 to 1 percent slopes; and TeB—Telferner fine sandy loam, 1 to 3 percent slopes.

The climax plant community is a true prairie. The composition by weight is about 95 percent grasses and 5 percent forbs. Annual production ranges from 5,500 pounds per acre in below average production years to 9,010 in above average production years.

About 60 percent of the climax plant community is made up of little bluestem. The other grasses are indiangrass, switchgrass, Florida paspalum, big bluestem, Virginia wildrye, brownseed paspalum, Pan American balsamscale, fringeleaf paspalum, longtom, sedges, low panicum, and knotroot bristlegrass. Forbs include Maximilian sunflower, bundleflower, sensitive briar, and yellow neptunia.

If regression occurs, as a result of heavy grazing, little bluestem and Florida paspalum are replaced by brownseed paspalum, slender bluestem, low panicum, knotroot bristlegrass, common bermudagrass, sedges, and longspike triden. If heavy grazing continues for many years, smutgrass, carpetgrass, Pan American balsamscale, broomsedge bluestem, common bahiagrass, and woody plants such as McCartney rose, running live oak, and huisache increase significantly.

Lowland ecological site. This site includes soil mapping unit: CnA—Cieno loam, 0 to 1 percent slopes.

The climax plant community is a wet prairie. The composition by weight is about 95 percent grasses and 5 percent forbs. Annual production ranges from 5,500 pounds per acre in below average production years to 8,000 pounds per acre in above average production years.

The dominant grasses are switchgrass, indiangrass, Florida paspalum, little bluestem, big bluestem, and eastern gamagrass. The other grasses are brownseed paspalum, knotroot bristlegrass, longtom, sedges, low panicum, low paspalums, broomsedge, and bushybeard bluestem. Forbs include sensitive briar, bundleflower, button snakeroot and Maximilian sunflower.

If regression occurs, as a result of heavy grazing, switchgrass, indiangrass, eastern gamagrass, little bluestem, big bluestem, and Maximilian sunflower are replaced by longtom, brownseed paspalum, broomsedge and bushy bluestem, knotroot bristlegrass, sedges, and low panicum. If heavy grazing continues for many years, plants such as vaseygrass, carpetgrass, smutgrass, common bahiagrass, baccharis, and sennabean increase significantly.

Salty Prairie Ecological site. This site includes soil mapping units: GrA—Greta fine sandy loam, 0 to 1 percent slopes; and WoA—Woodsboro loam, 0 to 1 percent slopes, rarely flooded.

The climax plant community is a salty prairie. The composition by weight is about 95 percent grasses and 5 percent forbs. Annual production ranges from 7,000 pounds per acre in below average production years to 11,000 pounds per acre in above average production years.

The dominant grass is gulf cordgrass. Other grasses are switchgrass, indiangrass, little bluestem, common reed, knotroot, bristlegrass, longtom, seashore saltgrass, and shoregrass. Forbs include bushy sea-oxeye and slim aster.

If regression occurs, as a result of heavy grazing, bluestem, switchgrass, indiangrass, and common reed are replaced by gulf cordgrass, bermudagrass, red lovegrass, pickleweed, croton, bitter sneezeweed, and matrimonyvine.

Sandy ecological site. This site includes soil mapping unit: MbB—Milby fine sand, 0 to 2 percent slopes.

The climax plant community is an open grassland. Mesquite and occasional live oak are scattered over the area. The interspaces are predominantly tall and mid grasses. The composition by weight is 80 percent grasses, 15 percent woody plants, and 5 percent forbs. Annual production ranges from 2,500 pounds per acre in below average production years to 5,000 pounds per acre in above average production years.

The dominant grass is little bluestem. Indiangrass, switchgrass, purpletop triden, sand lovegrass, switchgrass, and brownseed paspalum make up lesser amounts. Other grasses are balsamscale, hooded windmillgrass, tall dropseed, and low panicum. The forbs are western indigo, sensitive briar, snoutbean, partridge pea, and western ragweed. The abundance of forbs makes this a preferred site for dove and quail.

With continuous overgrazing, and the lack of natural fires, the taller grasses are grazed out. Little bluestem, indiangrass, and switchgrass are replaced by brownseed paspalum, tall dropseed, fall witchgrass, and other increasing species. They, in turn, are grazed out and replaced by red lovegrass, yankeeweed, bullnettle, snakecotton, and croton. Other invading plants are tumble lovegrass, sandbur, pricklypear, queensdelight, beebalm, pricklypoppy, and baccharis.

Sandy Bottomland ecological site. This site includes soil mapping units: ZaA—Zalco sand, 0 to 1 percent slopes, occasionally flooded; and ZcA—Zalco sand, 0 to 1 percent slopes, frequently flooded.

The climax plant community is a tall grass savannah. The composition by weight is about 75 percent grasses, 20 percent woody plants, and 5 percent forbs. Annual production ranges from 3,000 pounds per acre in below average production years to 7,000 pounds per acre in above average production years.

The dominant grasses are switchgrass, little bluestem, big bluestem, indiangrass, Virginia wildrye, purpletop, knotroot, and bristlegrass. Woody plants include cottonwood, hackberry, live oak, and willows. Forbs include partridge pea, American snoutbean, and sensitive briar.

If regression occurs, as a result of heavy grazing, switchgrass, little bluestem, indiangrass, Virginia wildrye and purpletop are replaced by balsamscale, knotroot, bristlegrass, and red lovegrass. If heavy grazing continues for many years, mesquite, grassbur, bull nettle, willows, and hairy grama increase significantly.

Tight Sandy Loam ecological site. This site includes soil mapping unit: BnB—Blanconia loamy fine sand, 0 to 2 percent slopes.

The climax plant community includes little bluestem, false Rhodesgrass, multiflowered Rhodesgrass, Arizona cottontop, plains bristlegrass, and pink pappusgrass. Annual production ranges from 2,700 pounds per acre in below average production years to 3,700 pounds during high average production years.

This site is used primarily for cattle grazing and wildlife habitat. These areas have a mix of trees, shrubs, and grasses that are used by cattle and all types of wildlife for food and shelter.

These areas are susceptible to erosion and invasion of unwanted woody species as a result of mismanagement and overgrazing. The encroachment of mesquite is the result.

Rangeland Productivity

Table 10 shows, for each soil that supports rangeland vegetation, the ecological site and the potential annual production of vegetation in favorable, normal, and unfavorable years. An explanation of the column headings in table 10 follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and proportion of species or in total production. The electronic "Field Office Technical Guide, (eFOTG)" which is available online at http://www.nrcs.usda.gov/technical/efotg, can provide specific information about ecological sites.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It 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 common percent of air-dry moisture content.

The objective in range management is to control grazing so that the plants growing on a site remain or improve to about the same in kind and amount as the climax plant community for that site. Such management generally results in the optimum production of vegetation, reduction of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Good production of livestock and forage on rangeland is obtained primarily by managing the time of grazing and limiting the amount of forage removed. The green parts of plants manufacture food for growth and store part of it for use in regrowth and seed production.

A typical growth curve for dominantly little bluestem and native perennial grasses in the Northern Rio Grande Plain (MLRA 83A) would be:

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	2	3	7	20	30	15	5	10	4	2	1

Approximately 72 percent of the annual forage production occurs in the months April to July responding to spring and early summer rains. A second smaller growth period may occur in the fall if sufficient moisture is available.

A typical growth curve for small grains in the Northern Rio Grande Plain (MLRA 83A) would be:

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
14	18	21	7	22	6	0	0	0	0	9	10

Approximately 85 percent of the annual grain production occurs in the months December to May, responding to winter and early spring rains. Very little growth occurs during the summer months, when sufficient moisture is not available.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Wildlife Habitat

Kenneth B. Hall, soil scientist, Natural Resources Conservation Service, helped prepare this section.

Soils, climate, and to a large degree, human activity, directly affect basic wildlife habitat requirements for food, water, and cover. Terrestrial wildlife, such as deer, turkey, squirrel, and cottontail rabbits, depend upon vegetation for food and cover. The kinds of soil in an area determine the amounts and kinds of vegetation, thus directly influencing the kinds and numbers of wildlife present.

Aquatic wildlife, such as largemouth bass, sunfish, and catfish, as well as wetland wildlife, such as ducks, geese, herons are also affected by the soils present. The kinds of soil determine the amount and kind of vegetation that will grow in aquatic and wetland habitats.

In Goliad County, watershed structures, and the many farm and ranch ponds provide habitat for fish, waterfowl, and upland wildlife.

Natural ponds are in scattered depressions where Tiocano clay is the primary soil. These waters are used by wildlife and migrating waterfowl in years of average to above average rainfall.

Drainageways are additional sources of surface water. Buchel and Sinton soils are examples of soils in the major drainageways, which include the San Antonio River and Coleto Creek. Tributaries of these major drainageways include Perdido Creek, and Manahuilla Creek. These bottom lands provide habitat for white-tailed deer, fox squirrels, and Rio Grande turkey; furbearers, such as coyotes, bobcats, raccoons, and beaver; waterfowl, such as ducks, geese, and herons; and for aquatic wildlife, such as bass, catfish, crappie, and sunfish.

The Elmendorf-Denhawken complex soils, along with Monteola and Coy soils, are examples of blackland soils that developed under native tall grasses. These blacklands provide habitat for white-tailed deer, coyote, and wild turkey. Some of the blackland was converted to cropland. As cropland, the principal habitat value is to migratory birds, such as mourning doves and waterfowl that feed on waste grain left after harvest. Wild turkey, white-tailed deer, and bobwhite quail also use these areas if sufficient tree or shrub cover is present. The habitat value of these cropland areas can be improved through minimum tillage, crop residue use, cover crops, or food plots.

Sarco soils (fig. 28) are an example of post oak soils. Under natural conditions, these post oak landscapes were a savannah of grass and scattered trees that provided habitat to deer, quail, and wild turkey. Periodic fires were important in maintaining the savannah landscape. The post oak and its accompanying shrubs and vines provide cover and food in years of adequate moisture to deer, turkey, and squirrels. Thinning of the post oak stands in strips or motts by mechanical or approved chemical methods, along with prescribed burning, can significantly improve the wildlife value of this habitat.

Colibro, Pernitas, Sarnosa, and Weesatche (fig.29) soils are examples of loamy soils. These loamy landscapes are naturally open grasslands with scattered woody plants. Some of this area was converted to cropland. This provides food for migratory wildlife as well as deer, quail, and turkey when woody cover is available.

Wyick and Vidauri soils are examples of prairie soils. These landscapes are naturally flat open grasslands with scattered running live oak motts and other woody plants. These live oak motts provide habitat for deer, feral hogs, and turkey.

Figure 28.—Turkeys under post oak trees on an area of Sarco coarse sand, 0 to 2 percent slopes.

Figure 29.—A whitetail deer on an area of Weesatche sandy clay loam, 1 to 3 percent slopes. The brush and live oak motts provide shelter and protection for many wildlife species.

Olmos and Parrita soils are examples of shallow soils. These soils usually have restrictive layers that limit moisture infiltration and have restrictive layers that limit moisture infiltration and plant root penetration. Under natural conditions, these soils supported open grassland with scattered shrubs. Poor management of livestock grazing and the lack of fire reduced the grass cover and allowed mixed brush to dominate most of these shallow landscapes that provide food and cover to deer, dove, and quail. However, the habitat of these shallow soils can be greatly improved by reducing the density of the brush and allowing grasses and forbs to reestablish. Mechanical or chemical brush control, along with prescribed burning and proper livestock grazing management, are effective conservation measures that can improve the habitat on these soils.

Nusil and Rhymes soils are examples of deep sandy terrace soils. These soils naturally supported a savannah of tall grasses, perennial and annual forbs, and scattered motts of trees. The presence of perennial and annual forbs, native bunch grasses, and the accompanying spaces of bare ground between plants make these deep sandy uplands valuable food and cover habitat for bobwhite quail. The conversion of these areas to introduced pasture grasses severely limits their value as habitat for quail. Proper grazing management, prescribed burning, and limited annual disking to encourage forb production are acceptable conservation measures that will improve the wildlife habitat of these deep sandy terraces.

Abandoned cropland and poorly managed range and pasture become infested with invading woody plants, such as huisache and mesquite, as well as introduced grasses, such as King Ranch bluestem.

The quality of habitat for wildlife deteriorates as the lack of plant diversity reduces the abundance of food. Reducing the density of invading woody plants, managing livestock grazing, and periodic prescribed burning are methods of improving the habitat on these loamy landscapes.

Table 11, Table 12, Table 13, Table 14, and Table 15 show the degree and kind of soil limitations that affect various kinds of habitat for wildlife. The tables show limitations of the soils for grain and seed crops for food and cover; domestic grasses and legumes for food and cover; irrigated grain and seed crops for food and cover; irrigated domestic grasses and legumes for food and cover; habitat for burrowing mammals and reptiles; upland native herbaceous plants; upland shrubs and vines; upland deciduous trees; riparian herbaceous plants; riparian shrubs, vines, and trees; and freshwater wetland plants. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting areas for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the element or kind of habitat. *Not limited* indicates that the soil has features that are very favorable for the element or kind of habitat. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Creating, improving, or maintaining habitat is impractical or impossible..

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Ratings for *grain and seed crops for food and cover* can be used in the selection of sites that have the soil properties and plant species necessary to sustain wildlife habitat. The ratings do not reflect the limitation for commercial agronomic production. The soil properties and features that affect the growth of grain and seed crops are soil texture, content of organic matter, the amount of rock fragments on or near the soil surface, available water capacity, depth to bedrock or a cemented pan, soil moisture and temperature regimes, depth to a high water table, ponding, flooding, permeability of the soil surface, slope, presence of excess salts in the soil, and susceptibility of the soil surface to water erosion and wind erosion. Examples of grain and seed crops are corn, grain sorghum, wheat, oats, sunflowers, and soybeans.

Ratings for *domestic grasses and legumes for food and cover* can be used in the selection of sites that have the soil properties and plant species necessary to sustain wildlife habitat. The ratings do not reflect the limitations for commercial agronomic production. The soil properties and features that affect the growth of grasses and legumes are soil texture, content of organic matter, the amount of rock fragments on or near the soil surface, available water capacity, depth to bedrock or a cemented pan, soil moisture and temperature regimes, depth to a high water table, ponding, flooding, permeability of the soil surface, slope, presence of excess salts in the soil, and susceptibility of the soil surface to water erosion and wind erosion. Examples of grasses and legumes are kleingrass, lovegrass, yellow bluestem, Eastern gamagrass, and switchgrass; examples of legumes are clover, vetch, and cowpeas.

Ratings for *irrigated grain and seed crops for food and cover* can be used in the selection of sites that have the soil properties and plant species necessary to sustain wildlife habitat. The ratings do not reflect the limitations for commercial agronomic production. The soil properties and features that affect the growth of grain and seed crops are soil texture, content of organic matter, the amount of rock fragments on or near the soil surface, available water capacity, depth to bedrock or a cemented pan, depth to a high water table, ponding, flooding, permeability of the soil surface, slope, presence of excess salts in the soil, and susceptibility of the soil surface to water erosion and wind erosion. Examples of grain and seed crops are corn, grain sorghum, wheat, oats, and soybeans.

Ratings for *irrigated domestic grasses and legumes for food and cover* can be used in the selection of sites that have the soil properties and plant species necessary to sustain wildlife habitat. The ratings do not reflect the limitations for commercial agronomic production. The soil properties and features that affect the growth of grasses and legumes are soil texture, content of organic matter, the amount of rock fragments on or near the soil surface, available water capacity, depth to bedrock or a cemented pan, depth to a high water table, ponding, flooding, permeability of the soil surface, slope, presence of excess salts in the soil, and susceptibility of the soil surface to water erosion and wind erosion. Examples of grasses are kleingrass, yellow bluestem, Eastern gamagrass, and switchgrass; examples of legumes are clover, vetch, and soybeans.

Ratings for *habitat for burrowing mammals and reptiles* indicate the limitation of the soil for maintaining or increasing local populations of specific burrowing animals. The soil properties and features that affect the preservation of these species are flooding, ponding, depth to bedrock or a cemented pan, depth to a high water table, sandy layers, clayey layers, a high content of organic matter, and high concentrations of rock fragments. Examples of burrowing mammals and reptiles are, gophers, badgers, lizards, rattlesnakes, and bull snakes.

Ratings for *upland native herbaceous plants* indicate the limitation of the soils as a growing medium for a diverse upland herbaceous plant community. This community is adapted to soils that are drier than the common soils in moist riparian and wetland zones but that are not as dry as the soils in upland desert areas. The soil properties and features that affect the ability of these species to thrive include soil texture, available water capacity, the presence of excess salts in the soil, soil moisture and temperature regimes, depth to a high water table, and rock fragments on the soil surface. Examples of upland wild herbaceous plants are little bluestem, indiangrass, brownseed paspalum, gayfeather, tick clover, and lespedeza.

Ratings for *upland shrubs and vines* indicate the limitation of the soils as a growing medium for a diverse upland shrub and vine community. This community is adapted to soils that are drier than those common in the moist riparian and wetland zones but that are not as dry as those in upland desert areas. The soil properties and features that affect the ability of these species to thrive include soil texture, content of organic matter, available water capacity, depth to bedrock or a cemented pan, the presence of excess salts in the soil, soil moisture and temperature regimes, depth to a high water table, and rock fragments on the soil surface. Examples of upland shrubs and vines are coral berry, grape, and greenbriar.

Ratings for *upland deciduous trees* indicate the limitation of the soils as a growing medium for a diverse upland deciduous tree community that meets specific local habitat requirements for targeted and nontargeted wildlife species. Typically, deciduous trees require better soil conditions than geographically related conifers. The soil properties and features that affect the ability of upland deciduous trees to thrive include available water capacity, depth to a high water table, depth to bedrock or a cemented pan, and soil moisture and temperature regimes. Examples of upland deciduous trees are live oak, bumelia, bois d'arc, hackberry, and cedar elm.

Ratings for *riparian herbaceous plants* indicate the limitation of the soils as a growing medium for herbaceous plants that are adapted to soil conditions that are wetter than those common in the drier upland areas. The soils suitable for this habitat generally are on flood plains, in depressions, on bottomland, in drainageways adjacent to streams, or in any other area where the soil is either saturated for some period during the year or is subject to periodic overflow from ponding or flooding. The soil properties and features that affect the ability of riparian herbaceous plants to persist include soil texture, content of organic matter, depth to a high water table, the frequency and duration of ponding and flooding, the presence of excess salts in the soil, rock fragments, and the soil temperature regime. Examples of riparian herbaceous plants are Virginia wildrye, Eastern gamagrass, switchgrass, whitegrass, broadleaf woodoats, switch cane, ice plant, mist flower, and white clover.

Ratings for *riparian shrubs, vines, and trees* indicate the limitation of the soils as a growing medium for shrubs, vines, and trees that are adapted to soil conditions that are wetter than those common in the drier upland areas. The soils suitable for this habitat generally are on flood plains, in depressions, on bottomland, in drainageways adjacent to streams, in areas of springs and seeps, or in any other area where the soil is either saturated for some period during the year or is subject to periodic overflow from ponding or flooding. The soil properties and features that affect the ability of riparian shrubs, vines, and trees to persist include available water capacity, depth to a high water table, the frequency and duration of ponding and flooding, the presence of excess salts in the soil, and the soil temperature regime. Examples of riparian shrubs, vines, and trees are cottonwood, willow, green ash, hackberry, burr oak, cedar elm, hawthorne, poison ivy, trumpet creeper, greenbriar, and grape.

Ratings for *freshwater wetland plants* indicate the limitation of the soils as a growing medium for plants that are adapted to wet soil conditions. The soils suitable for this habitat generally are in marshes, in depressions, on bottomland, in backwater areas on flood plains, in drainageways adjacent to streams, in areas of springs and seeps, or in any other area where the soil is not directly affected by moving floodwater but may be ponded during some part of the year. The soil properties and features that affect the ability of freshwater wetland plants to persist include soil texture, content of organic matter, depth to a high water table, the frequency and duration of ponding, the presence of excess salts in the soil, and soil reaction (pH). Examples of freshwater wetland plants are smartweed, wild millet, cattails, cut grass, giant cane, rattle box, sesbania, rushes, sedges, and reeds.

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

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

Habitat for woodland wildlife consists of areas of deciduous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodpeckers, squirrels, gray fox, raccoon, feral hogs, 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, egrets, geese, herons, shore birds, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include deer, doves, bobwhite quail, and meadowlark.

Recreation

Kenneth B. Hall, soil scientist, Natural Resources Conservation Service, helped prepare this section.

Recreational pursuits play a major role in the daily lives of the citizens of Goliad County and people from the surrounding areas. Many landowners supplement their income by leasing their property to individuals. In addition, absentee ownership of land within the county is increasing. These absentee landowners and lessors use the land for camping, hiking, fishing, and hunting year round.

The soils of the survey area are rated in Table 16 and Table 17 according to limitations that affect their suitability for recreation. The ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables 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 also are important. Soils that are 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.

The information in Table 16 and Table 17 can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

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 ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a seasonal high water table, ponding, flooding, and texture of the surface layer.

Golf course fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding,

Hydric Soils

In this section, hydric soils are defined and described.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; National Research Council, 1995; Tiner and others, 1985; US Army Corp of Engineers, 1987). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). The criteria are used to identify a phase of a soil series that normally is also a hydric soil. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2003), and in the "Soil Survey Manual" (Soil Survey Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they generally exhibit certain properties that can be observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 2002).

For information regarding hydric soils in the soil survey area, refer to the USDA Natural Resources Conservation Service Soil Data Mart at http://soildatamart.nrcs.usda.gov.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. 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 data in the tables described under the heading "Soil Properties."

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 between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, 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

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 18 and Table 19 show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

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 soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils are on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Table 20 and Table 21 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in down slope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

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. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid 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. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

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. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

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. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Table 22 and Table 23 provides information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

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 Table 22, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair*, or *poor* as potential sources of sand and gravel. A rating of good or fair means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated *good, fair*, or *poor* as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

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. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

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.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

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 whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a 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 AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Water Management

Table 24 provides 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 ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment (fig. 30). 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. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

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

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

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

Figure 30.—A pond in southwestern Goliad County. These types of structures not only prevent flooding from occurring downstream, but also provide water for livestock and wildlife.

Soil Properties

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

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

The estimates of soil properties are shown in tables. They include physical and chemical properties, and clay mineralogy.

Engineering Properties

Table 25 provides the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

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 across. "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 15 percent or more, 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 (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches across 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 across is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

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

Rock fragments larger than 10 inches across and 3 to 10 inches across 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 across 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 particle-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 generally omitted in the table.

Physical Soil Properties

Table 26 shows estimates of some physical 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.

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.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 26, 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 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.

Permeability (K_{sat}) 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 inches per hour, 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 table 26, 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 table 26 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 several 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 00.02 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 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 rock 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 27 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 decisiemens per meter (dS/m) 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 28 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, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a 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.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. It is assumed that the surface of the soil is bare and that the retention of the surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

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. Table 28 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 grayish 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. Table 28 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 29 shows estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

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 analysis of several typical pedons in the survey area are given in table 30 the results of chemical analysis in table 31, and the results of clay mineralogy are given in table 32. 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 Soil Characterization Laboratory, Texas Agricultural Experiment Station, College Station, Texas, and the USDA-NRCS, National Soil Survey Laboratory at Lincoln, Nebraska.

Depth to the upper and lower boundaries of each layer is indicated.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters across. Measurements reported as percent or quantity of unit weight were calculated on an ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods (USDA NRCS, 1996).

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).

C*oefficient of linear extensibility*—change in clod dimension based on whole soil (3D4).

Bulk density—1of less than 2 mm material, saran-coated clods field moist (4A1a), 1/3 bar (4A1d), ovendry (4A1h).

Water retained—pressure extraction, percentage of ovendry weight of less than 2-millimeter material; 1/3 or 1/10 bar (3C1), 15 bars (3C2).

Reaction (pH)—1:1 water dilution (4C1a2a1).

Extractable bases—ammonium acetate pH 7.0, ICP; calcium, magnesium, sodium, potassium (4B1a1a).

Extractable acidity (4B2b1a1).

Cation-exchange capacity—sum of cations (4B4b1).

Base saturation—sum of cations.

Exchangeable Sodium Percentage (ESP)—NH_4OAc, pH 7.0.

Electrical conductivity—saturation extract (4F1a1a).

Carbonate as calcium carbonate—(fraction less than 2 mm [80 mesh]) manometric (4E1a1a1a).

X-Ray Diffraction.—(7A1a1).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1998 and 1999). 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 33 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 Ustalf (Ust, meaning burnt or dry, 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 Haplustalfs (Hapl, meaning minimal horizonation, plus ustalf, the suborder of the Alfisols that has an ustic 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 Haplustalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, semiactive, thermic Typic Haplustalfs.

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" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 1998). Following the pedon description is the range of important characteristics of the soils in the series.

Ander Series

The Ander series consists of very deep, moderately well drained, soils that formed in residuum weathered from sandstone in the Goliad Formation. These nearly level or very gently sloping soils are on footslopes of low hills on an inland dissected coastal plain. Slope ranges from 0 to 3 percent. Soils of the Ander series are fine, smectitic, hyperthermic Udic Paleustolls.

Typical pedon of Ander fine sandy loam (fig. 31) in an area of Ander fine sandy loam, 1 to 3 percent slopes; from the intersection of Farm Road 1351 and Newton-Powell Road, 100 feet south on Farm Road 1351 to private ranch entrance, 0.3 mile west, 0.3 mile south, 1.8 miles west and southwest, 0.4 mile west, 0.95 mile north on ranch road, and 75 feet east in rangeland. Charco USGS topographic quadrangle; Latitude: 28 degrees, 38 minutes, 49.9 seconds North; Longitude: 97 degrees, 37 minutes, 10.3 seconds West; NAD 83.

A1—0 to 16 centimeters (0 to 6 inches); very dark brown (10YR 2/2) fine sandy loam, very dark grayish brown (10YR 3/2), moist; weak fine subangular blocky structure, and moderate medium granular structure; very friable, soft; common fine roots and many very fine roots; common fine interstitial and common very fine tubular pores; slightly acid; clear smooth boundary.

A2—16 to 30 centimeters (6 to 12 inches); black (10YR 2/1) fine sandy loam, black (10YR 2/1), moist; weak fine subangular blocky structure; very friable, soft; many very fine roots; common fine and medium tubular and many very fine tubular pores; neutral; abrupt smooth boundary.

Bt1—30 to 42 centimeters (12 to 17 inches); very dark brown (10YR 2/2) sandy clay, very dark brown (10YR 2/2), moist; moderate medium prismatic structure parting to moderate medium angular blocky; firm, hard; many very fine roots; many very fine tubular pores; 5 percent faint pressure faces; 10 percent distinct clay films; 1 percent very fine prominent dark reddish brown (5YR 3/4) masses of oxidized iron with sharp boundaries lining pores; 1 percent fine distinct dark grayish brown (2.5Y 4/2) masses of oxidized iron with clear boundaries in matrix; neutral; clear smooth boundary.

Bt2—42 to 71 centimeters (17 to 28 inches); grayish brown (10YR 5/2) sandy clay, dark grayish brown (10YR 4/2), moist; moderate medium prismatic structure parting to moderate medium angular blocky; firm, hard; common very fine and fine roots; common very fine and fine tubular pores; 10 percent faint pressure faces; 20 percent distinct clay films; 3 percent medium and coarse distinct dark grayish brown (2.5Y 4/2) masses of oxidized iron with diffuse boundaries in matrix; slightly alkaline; gradual smooth boundary.

Bt3—71 to 97 centimeters (28 to 38 inches); grayish brown (10YR 5/2) sandy clay, dark grayish brown (10YR 4/2), moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse angular blocky; firm, hard; common very fine roots; common very fine tubular pores; 5 percent faint pressure faces; 20 percent distinct clay films; 1 percent fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron with sharp boundaries in matrix; moderately alkaline; clear smooth boundary.

Btk1—97 to 114 centimeters (38 to 45 inches); pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3), moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse angular blocky; very firm, hard; common very fine and fine roots; common very fine to medium tubular pores; 10 percent faint clay films; 1 percent medium faint brown (10YR 4/3) masses of oxidized iron with clear boundaries in matrix; 3 percent fine white (10YR 8/1) masses of calcium carbonate masses; 2 percent medium white (10YR 8/1) nodules of calcium carbonate; very slightly effervescent; moderately alkaline; clear smooth boundary.

Btk2—114 to 151 centimeters (45 to 59 inches); pale yellow (2.5Y 7/3) sandy clay loam, light yellowish brown (2.5Y 6/3), moist; moderate medium and coarse subangular blocky structure; firm, moderately hard; common very fine roots;

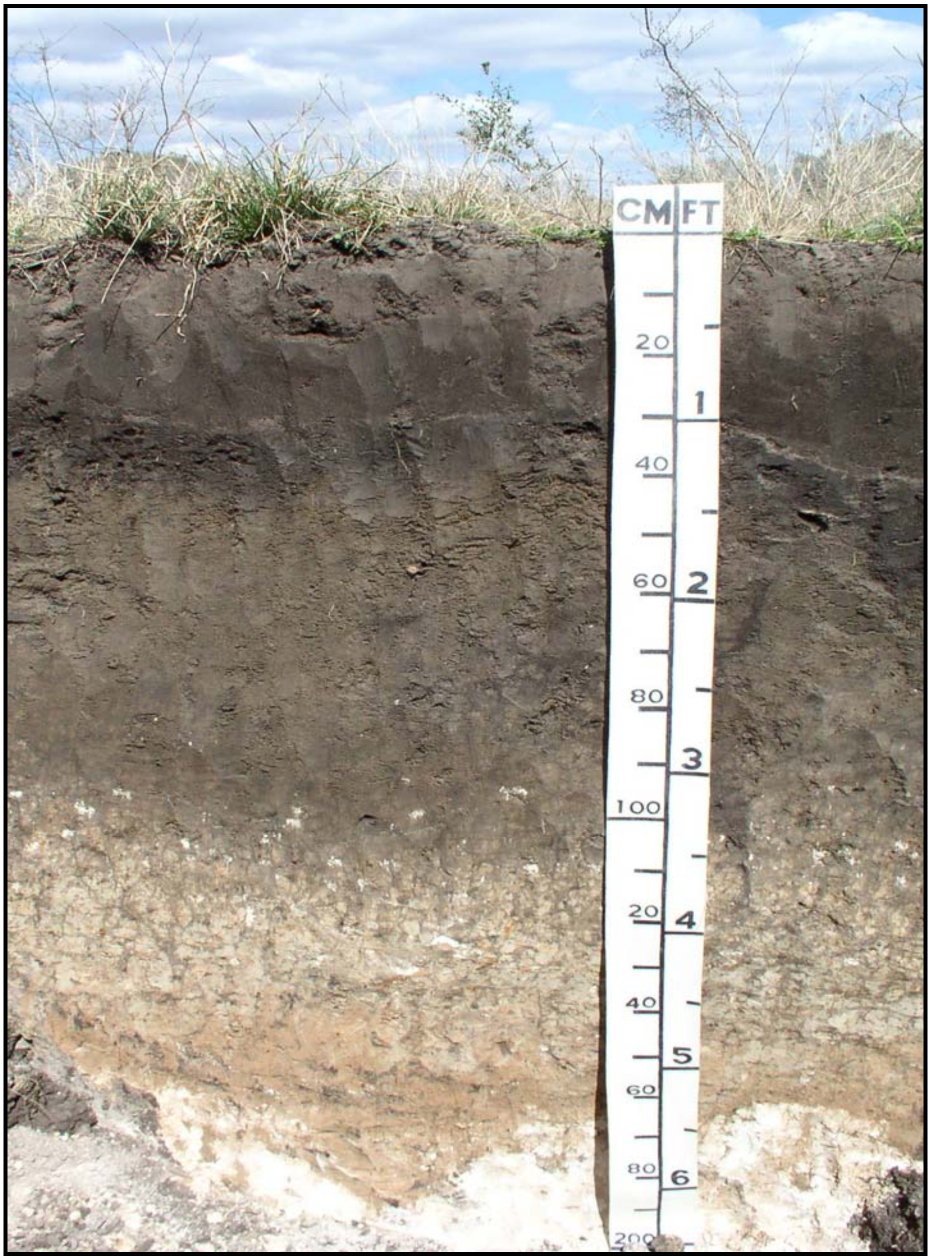

Figure 31.—Profile of Ander fine sandy loam, 1 to 3 percent slopes. The dark mollic epipedon extends to a depth of 42 centimeters (17 inches), and the subsoil has clayey textures. (Scale in centimeters and feet.)

common medium tubular and common very fine tubular pores; 10 percent distinct clay films; 3 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron with clear boundaries in matrix surrounding redox concentrations; 8 percent fine and medium prominent yellowish red (5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 3 percent fine white (10YR 8/1) masses of calcium carbonate; 2 percent medium white (10YR 8/1) nodules of calcium carbonate; very slightly effervescent; slightly alkaline; clear smooth boundary.

Btk3—151 to 183 centimeters (59 to 72 inches); light reddish brown (5YR 6/4) sandy clay loam, reddish brown (5YR 5/4), moist; moderate medium and coarse subangular blocky structure; very firm, moderately hard; common fine tubular and common very fine tubular pores; 10 percent distinct clay films; slightly effervescent; moderately alkaline; abrupt wavy boundary

Bk—183 to 203 centimeters (72 to 80 inches); light brown (7.5YR 6/4) loam, brown (7.5YR 5/4), moist; weak very coarse subangular blocky structure; very firm, moderately hard; 35 percent coarse white (10YR 8/1) masses of calcium carbonate; strongly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 2 or 3
Chroma: 1 to 3
Texture: fine sandy loam
Clay content: 10 to 15 percent
Reaction: slightly acid or neutral

Upper Bt horizon

Hue: 10YR
Value: 2 to 5
Chroma: 1 or 2
Texture: sandy clay or clay
Clay content: 35 to 47 percent
Redox concentrations: amount—2 to 12 percent; shades—red, brown, or yellow
Redox depletions: amount—0 to 2 percent; shades—gray
Coarse fragments: 0 to 2 percent
Reaction: slightly acid to slightly alkaline

Lower Bt horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 to 3
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 25 to 38 percent
Redox concentrations: amount—5 to 20 percent; shades—red, brown, or yellow
Redox depletions: amount—0 to 5 percent; shades—gray
Coarse fragments: 0 to 2 percent
Effervescence: none to slight
Reaction: neutral or slightly alkaline

Btk horizon

Hue: 5YR to 10YR
Value: 4 to 7
Chroma: 3 to 6
Texture: sandy clay loam or clay loam
Clay content: 25 to 35 percent

Coarse fragments: 0 to 5 percent
Calcium carbonate equivalent: 1 to 10 percent
Identifiable secondary calcium carbonate: amount—1 to 5 percent; kind—masses or concretions
Effervescence: very slight to strong
Reaction: slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 7
Chroma: 3 or 4
Texture: loam, sandy clay loam, or clay loam
Clay content: 20 to 35 percent
Coarse fragments: 0 to 5 percent
Calcium carbonate equivalent: 15 to 50 percent
Identifiable secondary calcium carbonate: amount—2 to 10 percent; kind—masses or concretions
Effervescence: slight to violent
Reaction: moderately alkaline

Blanconia Series

The Blanconia series consists of very deep, moderately well drained soils that formed in loamy alluvium of Pleistocene age. These nearly level or very gently sloping soils are on terraces of streams. Slope ranges from 0 to 2 percent. Soils of the Blanconia series are fine, smectitic, hyperthermic Oxyaquic Paleustalfs.

Typical pedon of Blanconia loamy fine sand, in an area of Blanconia loamy fine sand, 0 to 2 percent slopes; from the intersection of Texas Highway 202 and Farm Road 2441 in Bee County, 5.6 miles north on Farm Road 2441, 2.9 miles east on private ranch road across Sarco Creek to caliche road, 0.75 mile north on caliche road past oil well site to fenceline, 0.1 mile west along fenceline, and 100 feet in rangeland. Ryanville USGS topographic quadrangle; Latitude: 28 degrees, 28 minutes, 20 seconds North; Longitude: 97 degrees, 22 minutes, 16 seconds West; NAD 83.

A—0 to 23 centimeters (0 to 9 inches); brown (10YR 4/3) loamy fine sand, brown (10YR 5/3), dry; single grain; loose, very friable; many fine and common medium roots; common fine interstitial pores; 2 percent fine faint brown (7.5YR 4/3) iron concentrations with clear boundaries lining pores; 1 percent fine distinct strong brown (7.5YR 5/6) iron concentrations with diffuse boundaries lining pores; moderately acid; clear smooth boundary.

E—23 to 38 centimeters (9 to 15 inches); brown (10YR 5/3) loamy fine sand, very pale brown (10YR 7/3), dry; single grain; loose, very friable; common fine roots; common fine interstitial pores; 2 percent fine faint brown (7.5YR 4/3) iron concentrations with clear boundaries lining pores; 2 percent fine distinct strong brown (7.5YR 5/6) iron concentrations with diffuse boundaries lining pores; moderately acid; clear smooth boundary.

Bt1—38 to 64 centimeters (15 to 25 inches); dark gray (10YR 4/1) sandy clay, dark gray (10YR 4/1), dry; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm; common fine roots; common fine tubular pores; few distinct dark gray pressure surfaces; few distinct dark gray (10YR 4/1) clay films on surfaces of peds; 3 percent fine prominent strong brown (7.5YR 5/6) iron concentrations with sharp boundaries in root pores; 1 percent fine prominent yellow (10YR 7/6) iron concentrations with clear boundaries on surfaces of peds; a 1-inch zone, in upper part of horizon in contact with E horizon, of interfingering of white (10YR 8/1) albic materials; slightly acid; clear smooth boundary.

Bt2—64 to 76 centimeters (25 to 30 inches); grayish brown (10YR 5/2) sandy clay, light brownish gray (10YR 6/2); moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm; common very fine roots; common fine tubular pores; few distinct pressure surfaces; few distinct grayish brown (10YR 5/2) clay films on surfaces of peds; few rounded siliceous pebbles; 1 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries on surfaces of peds; 3 percent fine prominent brownish yellow (10YR 6/8) iron concentrations with clear boundaries on interiors of peds; neutral; clear smooth boundary.

Bt3—76 to 104 centimeters (30 to 41 inches); brown (10YR 5/3) sandy clay loam, pale brown (10YR 6/3), dry; moderate medium prismatic structure parting to moderate fine and medium angular blocky; hard, firm; common very fine roots; common fine tubular pores; few faint grayish brown (10YR 5/2) pressure surfaces; few distinct grayish brown (10YR 5/2) clay films on surfaces of peds; few rounded siliceous pebbles; 2 percent fine prominent yellowish red (5YR 5/8) iron concentrations with sharp boundaries on surfaces of peds; 2 percent fine distinct brownish yellow (10YR 6/6) iron concentrations with clear boundaries on surfaces of peds; neutral; gradual smooth boundary.

Bt4—104 to 127 centimeters (41 to 50 inches); light yellowish brown (2.5Y 6/3) sandy clay loam, pale yellow (2.5Y 7/3), dry; moderate medium subangular blocky structure; hard, firm; few faint brown (10YR 5/3) pressure surfaces; few faint brown (10YR 5/3) clay films on surfaces of peds; few fine rounded iron-manganese nodules between peds, few fine masses of calcium carbonate; few rounded siliceous pebbles; 1 percent fine and medium distinct yellowish brown (10YR 5/6) iron concentrations with clear and sharp boundaries on surfaces of peds; neutral; clear smooth boundary.

Bk—127 to 180 centimeters (50 to 71 inches); light brownish gray (2.5Y 6/2) sandy clay loam, light gray (2.5Y 7/2), dry; few fine distinct light olive brown (2.5Y 5/6) mottles; moderate medium and coarse subangular blocky structure; hard, firm; common fine and medium masses of iron-manganese in cracks; many fine nodules of calcium carbonate; many fine and medium masses of calcium carbonate; matrix is noneffervescent; moderately alkaline; gradual smooth boundary.

BCk—180 to 203 centimeters (71 to 80 inches); light gray (2.5Y 7/2) sandy clay loam, pale yellow (2.5Y 8/2); weak medium and coarse subangular blocky structure; hard, firm; many fine nodules of calcium carbonate; many fine and medium masses of calcium carbonate; few lenses of coarse sand 2 to 8 millimeters (1/8 to 1/4 inch thick) in lower part; matrix is noneffervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 4 or 5, dry or moist
Chroma: 2 or 3, dry or moist
Texture: loamy fine sand
Clay content: 3 to 10 percent
Iron concentrations: amount—0 to 3 percent; size—fines; contrast—faint or distinct; shades—brown; boundary—sharp or clear; location—throughout
Reaction: strongly acid or moderately acid

E horizon

Hue: 10YR
Value: 5 to 7, dry or moist

Chroma: 2 to 4, dry or moist
Texture: loamy sand or loamy fine sand
Clay content: 3 to 10 percent
Iron concentrations: amount—2 to 5 percent; size—fine; contrast—faint or distinct; shades—brown; boundary—sharp or clear; location—throughout
Reaction: strongly acid or moderately acid

Upper Bt horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 1 or 2, dry or moist
Texture: sandy clay or clay
Clay content: 35 to 45 percent
Clay films: location—surfaces of peds; contrast—faint or distinct
Iron concentrations: amount—2 to 10 percent; size—fine or medium; contrast—faint to prominent; shades—red, brown, or yellow; boundary—sharp or clear; location—throughout
Iron depletions: amount—0 to 2 percent; size—fine; contrast—faint; shades—gray; boundary—sharp; location—ped interiors
Reaction: moderately acid to neutral

Lower Bt horizon

Hue: 10YR or 2.5Y
Value: 5 to 7, dry or moist
Chroma: 2 or 3, dry or moist
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 25 to 35 percent
Clay films: location—surfaces of peds; contrast—faint or distinct
Iron concentrations: amount—2 to 15 percent; size—fine to coarse; contrast—faint to prominent; shades—red, brown, or yellow; boundary—sharp or clear; location—throughout
Iron depletions: amount—0 to 2 percent; size—fine; contrast—faint; boundary—sharp; location—ped interiors
Reaction: neutral or slightly alkaline

Bk horizon

Hue: 10YR or 2.5Y
Value: 6 or 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: sandy clay loam or clay loam
Clay content: 20 to 35 percent
Clay films: location—surfaces of peds; contrast—faint or distinct
Iron concentrations: amount—0 to 5; size—fine or medium; contrast—faint or distinct; shades—brown or yellow; boundary—clear; location—throughout
Calcium carbonate equivalent: 10 to 15 percent
Visible calcium carbonate: amount—15 to 30 percent; size—fine and medium as nodules and masses
Effervescence: none to slight
Reaction: slightly alkaline or moderately alkaline

BCk horizon

Hue: 10YR or 2.5Y
Value: 6 or 7, dry or moist
Chroma: 2 to 4, dry or moist

Texture: sandy clay loam or clay loam
Clay content: 22 to 35 percent
Clay films: location—surfaces of peds; contrast—faint or distinct
Iron concentrations: amount—0 to 5; size—fine or medium; contrast—faint or distinct; shades—brown or yellow; boundary—clear; location—throughout
Calcium carbonate equivalent: 10 to 15 percent
Visible calcium carbonate: amount—15 to 30 percent; size—fine and medium as nodules and masses
Effervesence: none to slight
Reaction: slightly alkaline or moderately alkaline

Buchel Series

The Buchel series consists of very deep, moderately well drained soils that formed in clayey, calcareous alluvial sediments of Holocene age. These soils are on nearly level flood plains. Slope is 0 to 1 percent. Soils of the Buchel series are fine, smectitic, hyperthermic Typic Haplusterts.

Typical pedon of Buchel clay in an area of Buchel clay, 0 to 1 percent slopes, occasionally flooded; from the intersection of U.S. Highway 59 and Texas Highway 239 west of Goliad, 0.9 mile south on U.S. Highway 59, and 200 feet west in pastureland. Goliad USGS topographic quadrangle; Latitude: 28 degrees, 39 minutes, 23.50 seconds North; Longitude: 97 degrees, 25 minutes, 38.90 seconds West; NAD 83.

A—0 to 18 centimeters (0 to 7 inches); very dark gray (10YR 3/1) clay, black (10YR 2/1), moist; moderate fine subangular blocky structure; very firm, very hard; many very fine and common fine and medium roots; common fine tubular pores; slightly effervescent; slightly alkaline; gradual wavy boundary.

Bss1—18 to 33 centimeters (7 to 13 inches); dark gray (10YR 4/1) clay, very dark gray (10YR 3/1), moist; moderate medium wedge structure parting to moderate medium angular blocky; very firm, very hard; common very fine roots; common very fine tubular pores; 10 percent distinct slickensides (pedogenic); slightly effervescent; slightly alkaline; gradual wavy boundary.

Bss2—33 to 61 centimeters (13 to 24 inches); dark gray (10YR 4/1) clay, very dark gray (10YR 3/1), moist; moderate medium wedge structure parting to moderate medium angular blocky; very firm, very hard; common very fine roots; common very fine tubular pores; 15 percent distinct slickensides (pedogenic); strongly effervescent; moderately alkaline; gradual wavy boundary.

Bss3—61 to 91 centimeters (24 to 36 inches); dark gray (10YR 4/1) clay, very dark gray (10YR 3/1), moist; weak coarse wedge structure parting to weak coarse angular blocky; very firm, very hard; common very fine roots; common very fine tubular pores; 20 percent distinct slickensides (pedogenic); strongly effervescent; moderately alkaline; gradual wavy boundary.

Bkss1—91 to 132 centimeters (36 to 52 inches); gray (10YR 5/1) clay, dark gray (10YR 4/1), moist; weak coarse wedge structure parting to weak coarse subangular blocky; very firm, very hard; 20 percent distinct slickensides (pedogenic); strongly effervescent; moderately alkaline; gradual wavy boundary.

Bkss2—132 to 152 centimeters (52 to 60 inches); gray (10YR 5/1) clay, gray (10YR 5/1), moist; weak coarse angular blocky structure; very firm, very hard; 15 percent distinct slickensides (pedogenic); strongly effervescent; moderately alkaline; gradual wavy boundary.

Bkss3—152 to 203 centimeters (60 to 80 inches); pale brown (10YR 6/3) clay, brown (10YR 5/3), moist; weak coarse subangular blocky structure; very firm, very hard; 10 percent distinct slickensides (pedogenic); strongly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 2 to 4
Chroma: 1 to 2
Texture: clay
Effervescence: none to slight
Reaction: slightly alkaline or moderately alkaline

Bss horizon

Hue: 10YR
Value: 2 to 5
Chroma: 1 to 2
Texture: clay or silty clay
Iron-manganese concentrations: amount—2 to 20 percent; kind—iron-manganese masses
Effervescence: very slight to strong
Reaction: slightly alkaline or moderately alkaline

Bkss horizon

Hue: 10YR
Value: 3 to 6
Chroma: 1 to 3
Texture: clay or silty clay
Redox concentrations: amount—0 to 2 percent; size—fine; shades—brown
Redox depletions: amount—none to common; size—fine; shades—gray
Identifiable secondary calcium carbonate: amount—few to common; size—fine
Effervescence: slight to strong
Reaction: slightly alkaline or moderately alkaline

B’ss horizon (where present)

Hue: 10YR
Value: 4 to 7
Chroma: 1 to 4
Texture: clay or silty clay
Redox concentrations: amount—none to common; shades—brown
Effervescence: very slight to strong
Reaction: slightly alkaline or moderately alkaline

Cieno Series

The Cieno series consists of very deep, poorly drained, very slowly permeable soils that formed in loamy sediments of Pleistocene Age. These soils are oval depressions. Slope is 0 to 1 percent. Soils of the Cieno series are fine-loamy, siliceous, active, hyperthermic Typic Vermaqualfs.

Typical pedon of Cieno loam in an area of Cieno loam, 0 to 1 percent slopes; from the intersection of U.S. Highway 77 and Farm Road 1315 in Victoria, 3.0 miles northeast on Farm Road 1315 to gravel road, 0.4 mile southeast and 0.2 mile northeast on gravel road, and 150 feet northwest in rangeland. Victoria East USGS topographic quadrangle; Latitude: 28 degrees 52 minutes 28.00 seconds North; Longitude: 96 degrees 57 minutes 26.00 seconds West; NAD 83.

A—0 to 19 centimeters (0 to 8 inches); 50 percent dark gray (10YR 4/1), 25 percent dark grayish brown (10YR 4/2), and 15 percent light brownish gray (10YR 6/2) loam, 50 percent gray (10YR 5/1), 25 percent grayish brown (10YR 5/2), and 15 percent light gray (10YR 7/2), dry; weak medium subangular blocky structure; friable, hard; common fine and medium roots; many fine and medium tubular pores; 10 percent fine prominent strong brown (7.5YR 4/6) masses of oxidized iron with sharp boundaries lining pores; 15 percent crayfish krotovinas; very strongly acid; clear smooth boundary.

E/B—19 to 40 centimeters (8 to 16 inches); 30 percent dark gray (10YR 4/1) and 20 percent pale brown (10YR 6/3) sandy clay loam, 30 percent gray (10YR 5/1) and 20 percent very pale brown (10YR 7/3), dry; weak medium subangular blocky structure; friable, very hard; common fine roots and few medium roots; many fine and medium tubular pores; 5 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron with clear boundaries lining pores and 10 percent fine prominent light gray (10YR 7/2) iron depletions with sharp boundaries in matrix surrounding redox concentrations and 30 percent fine prominent red (2.5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; 50 percent crayfish krotovinas; 20 percent of the krotovinas are active tubules; 30 percent of the krotovinas are filled with a mixture of grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) loam and very dark gray (10YR 3/1) clay; strongly acid; clear smooth boundary.

Btg1—40 to 62 centimeters (16 to 24 inches); very dark gray (10YR 3/1) clay loam, dark gray (10YR 4/1), dry; moderate coarse prismatic structure parting to moderate medium angular blocky; firm, very hard; few fine and medium roots; many fine and medium tubular pores; 2 percent patchy faint black (10YR 2/1) clay films on faces of peds; 5 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix and 10 percent fine prominent red (2.5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; 55 percent crayfish krotovinas; 20 percent of the krotovinas are active tubules; 35 percent of the krotovinas are filled with a mixture of grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) loam and very dark gray (10YR 3/1) clay; strongly acid; clear wavy boundary.

Btg2—62 to 92 centimeters (24 to 36 inches); dark gray (10YR 4/1) clay loam, gray (10YR 5/1), dry; strong coarse prismatic structure parting to moderate medium angular blocky; firm, very hard; few fine and medium roots; common very fine and fine tubular pores; 2 percent patchy faint very dark gray (10YR 3/1) clay films on faces of peds; 10 percent fine prominent red (2.5YR 4/6) masses of oxidized iron with sharp boundaries in matrix and 10 percent medium prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 50 percent crayfish krotovinas; 20 percent of the krotovinas are active tubules; 30 percent of the krotovinas are filled with a mixture of grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) loam and very dark gray (10YR 3/1) clay; moderately acid; clear wavy boundary.

Btg3—92 to 118 centimeters (36 to 47 inches); dark gray (10YR 4/1) sandy clay loam, gray (10YR 5/1), dry; strong coarse prismatic structure parting to moderate coarse angular blocky; firm, very hard; few fine and medium roots; few very fine tubular pores; 2 percent patchy faint dark gray (10YR 4/1) clay films on faces of peds; 1 percent medium prominent yellowish brown (10YR 5/6) masses of oxidized iron with clear boundaries in matrix and 10 percent medium distinct light brownish gray (2.5Y 6/2) iron depletions with clear boundaries in matrix surrounding redox concentrations; 30 percent crayfish krotovinas; 5 percent of the krotovinas are active tubules; 25 percent of the krotovinas are filled with a mixture of grayish brown (10YR 5/2) fine sandy loam and dark grayish brown (10YR 4/2) loam and very dark gray (10YR 3/1) clay; moderately acid; clear wavy boundary.

Btg4—118 to 143 centimeters (47 to 56 inches); 55 percent dark gray (10YR 4/1) and 45 percent light brownish gray (2.5Y 6/2) sandy clay loam, 55 percent gray (10YR 5/1) and 45 percent light gray (2.5Y 7/2), dry; moderate coarse prismatic structure parting to moderate coarse angular blocky; firm, very hard; few fine and medium roots; 10 percent patchy faint black (10YR 2/1) clay films on faces of peds; 1 percent fine yellowish brown (10YR 5/6) masses of oxidized iron with clear boundaries in matrix and 1 percent fine black (7.5YR 2.5/1) iron-manganese masses with sharp boundaries in matrix; 25 percent crayfish krotovinas; 10 percent of the krotovinas are active tubules with dark gray (10YR 4/1) clay lined cups at the base of the tubule; 15 percent of the krotovinas are filled in with a mixture of grayish brown (10YR 5/2) fine sandy loam and dark grayish brown (10YR 4/2) loam; moderately acid; gradual smooth boundary.

Btg5—143 to 185 centimeters (56 to 73 inches); light brownish gray (2.5Y 6/2) sandy clay loam, light gray (2.5Y 7/2), dry; moderate coarse prismatic structure parting to weak coarse angular blocky; firm, hard; 15 percent discontinuous faint grayish brown (2.5Y 5/2), moist, clay films on faces of peds and 50 percent distinct grayish brown (10YR 5/2) sand coats on vertical faces of peds; 1 percent medium yellowish brown (10YR 5/6) masses of oxidized iron with clear boundaries in matrix and 1 percent fine black (7.5YR 2.5/1) iron-manganese masses with sharp boundaries in matrix; 25 percent crayfish krotovinas; 10 percent of the krotovinas are active tubules with dark gray (10YR 4/1) clay lined cups at the base of the tubule; 15 percent of the krotovinas are filled in with a mixture of grayish brown (10YR 5/2) fine sandy loam and dark grayish brown (10YR 4/2) loam; slightly acid; gradual smooth boundary.

Btg6—185 to 203 centimeters (73 to 80 inches); light gray (10YR 7/1) sandy clay loam, light gray (10YR 7/1), dry; weak medium subangular blocky structure; firm, hard; few very fine roots; 2 percent faint grayish brown (10YR 5/2), moist, sand coats on vertical faces of peds and 2 percent patchy faint gray (10YR 5/1) clay films on faces of peds; 1 percent medium prominent red (2.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix and 1 percent fine distinct black (10YR 2/1) iron-manganese nodules with sharp boundaries in matrix; 15 percent crayfish krotovinas; 5 percent of the krotovinas are active tubules with dark gray (10YR 4/1) clay lined cups at the base of the tubule; 10 percent of the krotovinas are filled in with a mixture of grayish brown (10YR 5/2) fine sandy loam and dark grayish brown (10YR 4/2) loam; slightly acid.

A horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: loam
Clay content: 15 to 25 percent
Redox concentrations: amount—0 to 5 percent; shades—brown or yellow
Crayfish bioturbation: 10 to 35 percent
Reaction: strongly acid to neutral

E/B horizon (where present)

Hue: 10YR or 2.5Y
Value: 4 to 7
Chroma: 1 to 3
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 30 to 40 percent
Redox concentrations: amount—0 to 5 percent; shades—red, brown, or yellow
Crayfish bioturbation: 30 to 55 percent
Reaction: strongly acid to neutral

Upper Btg horizon

Hue: 10YR or 2.5Y
Value: 3 to 7
Chroma: 1 or 2
Texture: sandy clay loam or clay loam
Clay content: 25 to 35 percent
Redox concentrations: amount—0 to 10 percent; shades—brown or yellow
Redox depletions: amount—0 to 5 percent; shades—gray
Iron-manganese concentrations: amount—0 to 2 percent; size—4 to 8 millimeters; shades—brown or black
Crayfish bioturbation: 50 to 60 percent
Reaction: strongly acid to neutral

Lower Btg horizon

Hue: 10YR or 2.5Y
Value: 4 to 7
Chroma: 1 or 2
Texture: sandy clay loam or clay loam
Clay content: 25 to 35 percent
Redox concentrations: amount—0 to 10 percent; shades—brown or yellow
Redox depletions: amount—0 to 5 percent; shades—brown
Iron-manganese concentrations: amount—0 to 2 percent; size—4 to 8 millimeters; shades—brown or black
Identifiable secondary calcium carbonate: amount—0 to 5 percent; kind—films, masses, nodules, or threads
Crayfish bioturbation: 10 to 45 percent
Reaction: slightly acid to slightly alkaline

Bg or BC horizon (where present)

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 or 2
Texture: sandy clay loam or clay loam
Clay content: 25 to 35 percent
Redox concentrations: amount—0 to 10 percent; shades—brown or yellow
Redox depletions: amount—0 to 5 percent; shades—brown
Iron-manganese concentrations: amount—0 to 2 percent; size—4 to 8 millimeters; shades—brown or black
Identifiable secondary calcium carbonate: amount—0 to 5 percent; kind—films, masses, nodules, or threads
Crayfish bioturbation: 10 to 45 percent
Reaction: slightly acid to slightly alkaline

Clareville Series

The Clareville series consists of very deep, well drained soils that formed in loamy alluvial sediments of Holocene age. These nearly level or very gently sloping soils are on base slope on draws and drainageways. Slope ranges from 0 to 3 percent. Soils of the Clareville series are fine, smectitic, hyperthermic Pachic Argiustolls.

Typical pedon of Clareville sandy clay loam in an area of Clareville sandy clay loam, 0 to 1 percent slopes, rarely flooded; from the intersection of Texas Highway 239 and U.S. Highway 59 west of Goliad, 2.2 miles west on Texas Highway 239 to private road on south side of highway, 0.3 mile south on private road, and 50 feet east in cropland.

Goliad USGS topographic quadrangle; Latitude: 28 degrees 39 minutes 44.70 seconds North; Longitude: 97 degrees 27 minutes 11.90 seconds West; NAD 83.

Ap—0 to 23 centimeters (0 to 9 inches); very dark gray (10YR 3/1) sandy clay loam, black (10YR 2/1), moist; moderate fine and medium subangular blocky structure; soft, firm; common very fine and fine roots; common very fine and fine tubular pores; neutral; abrupt smooth boundary.

Bt1—23 to 43 centimeters (9 to 17 inches); very dark gray (10YR 3/1) clay loam, black (10YR 2/1), moist; moderate medium subangular blocky structure; slightly hard, firm; common very fine and fine roots; common very fine tubular pores; neutral; clear smooth boundary.

Bt2—43 to 71 centimeters (17 to 28 inches); very dark gray (10YR 3/1) clay, black (10YR 2/1), moist; moderate medium prismatic structure parting to moderate medium angular blocky; slightly hard, firm; common very fine roots; common very fine tubular pores; 10 percent distinct black (10YR 2/1) clay films; neutral; gradual wavy boundary.

Bt3—71 to 96 centimeters (28 to 38 inches); dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2), moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse angular blocky; hard, very firm; few very fine roots; few very fine tubular pores; 20 percent distinct black (10YR 2/1) clay films; slightly alkaline; gradual wavy boundary.

Btk1—96 to 119 centimeters (38 to 47 inches); brown (10YR 5/3) sandy clay loam, brown (10YR 5/3), moist; moderate coarse prismatic structure parting to moderate medium and coarse angular blocky; hard, very firm; few very fine roots; few very fine tubular pores; 22 percent distinct very dark gray (10YR 3/1) clay films on vertical faces of peds; 1 percent fine threadlike carbonate masses; slightly effervescent; moderately alkaline; gradual smooth boundary.

Btk2—119 to 157 centimeters (47 to 62 inches); pale brown (10YR 6/3) clay loam, brown (10YR 5/3), moist; weak coarse subangular blocky structure; very hard, very firm; few very fine tubular pores; 30 percent prominent dark gray (10YR 4/1) clay films; 3 percent fine and medium carbonate masses; slightly effervescent; moderately alkaline; gradual smooth boundary.

Btk3—157 to 203 centimeters (62 to 80 inches); light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4), moist; weak coarse subangular blocky structure; hard, firm; few very fine tubular pores; 10 percent distinct dark grayish brown (10YR 4/2) clay films; 5 percent fine and medium carbonate masses; strong effervescence moderately alkaline.

A horizon

Hue: 10YR
Value: 2 to 4
Chroma: 1 to 3
Texture: sandy clay loam
Reaction: neutral or slightly alkaline

Bt horizon

Hue: 7.5YR or 10YR
Value: 2 to 4
Chroma: 1 or 2
Texture: sandy clay loam, clay loam, sandy clay, or clay
Reaction: neutral or slightly alkaline

Btk or Bk horizons

Hue: 7.5YR or 10YR
Value: 3 to 6 (increases with depth)

Chroma: 1 to 4 (increases with depth)
Texture: sandy clay loam, clay loam, sandy clay, or clay
Calcium carbonate equivalent: 5 to 30 percent
Effervescence: none to strong

Colibro Series

The Colibro series consists of very deep, well drained soils that formed in erosional calcareous loamy material of Quaternary age. These gently sloping to moderately steep soils are on ancient alluvial terraces. Slope ranges from 3 to 12 percent. Soils of the Colibro series are fine-loamy, carbonatic, hyperthermic Typic Calciustepts.

Typical pedon of Colibro sandy clay loam in an area of Colibro sandy clay loam, 3 to 5 percent slopes; west of Poth, Texas in Wilson County, about 4.25 miles on Farm Road 541 to intersection with unpaved county road, 0.3 mile south on county road, and site is 200 feet east of county road. Dewees USGS topographic quadrangle; Latitude: about 28 degrees 59 minutes 21 seconds North; Longitude: 98 degrees 6 minutes 8.5 seconds West. NAD 83.

A—0 to 15 centimeters (0 to 6 inches); grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2), moist; weak fine granular and very fine subangular blocky structure; hard, friable; many fine roots; few fragments of snail shells; few films and threads of calcium carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary.

Ak—15 to 41 centimeters (6 to 16 inches); grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2), moist; moderate medium subangular blocky structure; hard, friable; many fine roots; few fragments of snail shells; few films, threads and concretions of calcium carbonate; violently effervescent; moderately alkaline; gradual smooth boundary.

Bk1—41 to 81 centimeters (16 to 32 inches); pale brown (10YR 6/3) loam, brown (10YR 5/3), moist; moderate fine subangular blocky structure; hard, friable; few fragments of snail shells; 5 percent films, threads, and concretions of calcium carbonate; violently effervescent; moderately alkaline; gradual smooth boundary.

Bk2—81 to 122 centimeters (32 to 48 inches); very pale brown (10YR 7/4) fine sandy loam, very pale brown (10YR 7/4), moist; weak fine subangular blocky structure; slightly hard, very friable; 5 percent faint films and threads of calcium carbonate in upper part; violently effervescent; moderately alkaline; gradual smooth boundary.

2Ck—122 to 152 centimeters (48 to 60 inches); very pale brown (10YR 8/3) loamy fine sand, very pale brown (10YR 7/3), moist; massive; slightly hard, very friable; violently effervescent; moderately alkaline.

A and Ak horizon

Hue: 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: loam or sandy clay loam
Calcium carbonate equivalent: 30 to 50 percent
Identifiable secondary calcium carbonate: amount—few to common; kind—threads, masses, films, or nodules
Effervescence: strong or violent

Bk horizon

Hue: 10YR
Value: 5 to 7
Chroma: 2 to 4

Texture: loam or sandy clay loam
Calcium carbonate equivalent: 40 to 70 percent
Identifiable secondary calcium carbonate: amount—few to common; kind—threads, masses, films, or nodules
Effervescence: strong or violent

2Ck horizon (where present)

Hue: 10YR
Value: 6 to 8
Chroma: 3 or 4
Texture: fine sandy loam or loam
Calcium carbonate equivalent: 40 to 70 percent
Identifiable secondary calcium carbonate: amount—few to common; kind—threads, masses, films, or nodules
Effervescence: strong or violent

Contee Series

The Contee series consists of very deep, well drained soils, that formed in clayey fluviomarine deposits derived from the Beaumont Formation of Pleistocene age. These nearly level to gently sloping soils are on ancient flood plains. Slope is 0 to 1 percent. Soils of the Contee series are fine, smectitic, hyperthermic Chromic Hapluderts.

Typical pedon of Contee clay loam in an area of Dacosta-Contee complex, 0 to 1 percent slopes; in Port Lavaca in Calhoun County, from the intersection of Texas Highway 35 and U.S. Highway 87 about 5.6 miles southwest on Texas Highway 35, 0.35 mile northwest on a county road, and 60 feet southwest of county road on microhigh in rangeland. Port Lavaca West USGS topographic quadrangle; Latitude: 28 degrees, 34 minutes, 04 seconds North; Longitude: 96 degrees, 43 minutes, 40 seconds West; NAD 83.

A—0 to 20 centimeters (0 to 8 inches); dark gray (10YR 4/1) clay loam, gray (10YR 5/1), dry; moderate fine subangular blocky structure; very hard, firm, sticky; few fine black (10YR 2/1) iron-manganese concretions; common fine concretions of calcium carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bss1—20 to 69 centimeters (8 to 27 inches); light brownish gray (10YR 6/2) clay, light gray (10YR 7/2), dry; strong medium and fine angular blocky structure; very hard, very firm, sticky; few fine roots; few tubular pores; common distinct slickensides; common prominent pressure faces; few fine black (10YR 2/1) iron-manganese concretions; few fine concretions of calcium carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bss2—69 to 124 centimeters (27 to 49 inches); gray (10YR 6/1) clay, light gray (10YR 7/1), dry; moderate fine and very fine angular blocky structure; very hard, very firm, sticky; few fine roots; common distinct slickensides; common prominent pressure faces; few fine black (10YR 2/1) iron-manganese concretions; about 10 percent concretions of calcium carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk—124 to 157 centimeters (49 to 62 inches); light brownish gray (10YR 6/2) clay, light gray (10YR 7/2), dry; weak fine angular blocky structure; very hard, firm, sticky; few fine faint light yellowish brown (10YR 6/4) masses of oxidized iron in matrix with sharp boundaries; few fine black (10YR 2/1) iron-manganese concretions; about 10 percent fine concretions of calcium carbonate; strongly effervescent; moderately alkaline; gradual boundary.

BCk—157 to 203 (62 to 80 inches); light gray (10YR 7/2) clay loam, light gray (10YR 7/2), dry; massive; very hard, firm; sticky; common fine faint yellow (10YR 7/6) iron concentrations; few fine black (10YR 2/1) iron-manganese concretions; about 15 percent masses and fine concretions of calcium carbonate; strongly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 1 or 2
Texture: clay loam
Clay content: 35 to 50 percent
Redox concentrations: amount—0 to 2 percent; shades—brown or yellow
Iron manganese concretions: amount—0 to 2 percent
Identifiable secondary calcium carbonate: amount—1 to 3 percent; kind—concretions or masses
Effervescence: none to slight
Reaction: neutral to moderately alkaline

Bss horizon

Hue: 10YR to 5Y
Value: 4 to 7
Chroma: 1 or 2
Texture: silty clay or clay
Clay content: 40 to 50 percent
Redox concentrations: amount—0 to 2 percent; shades—brown or yellow
Iron manganese concretions: amount—0 to 2 percent
Identifiable secondary calcium carbonate: amount—1 to 3 percent; kind—concretions or masses
Effervescence: none to strong
Reaction: slightly alkaline or moderately alkaline

Bkss horizon (where present)

Hue: 10YR to 5Y
Value: 5 to 7
Chroma: 1 or 2
Texture: silty clay or clay
Clay content: 40 to 50 percent
Redox concentrations: amount—0 to 2 percent; shades—brown or yellow
Iron manganese concretions: amount—0 to 2 percent
Identifiable secondary calcium carbonate: amount—1 to 3 percent; kind—concretions or masses
Effervescence: slight to strong
Reaction: slightly alkaline or moderately alkaline

Bk horizon

Hue: 10YR to 5Y
Value: 5 to 7
Chroma: 1 or 2
Texture: silty clay or clay
Clay content: 40 to 50 percent
Redox concentrations: amount—0 to 2 percent; shades—brown or yellow
Iron manganese concretions: amount—0 to 2 percent
Identifiable secondary calcium carbonate: amount—1 to 3 percent; kind—concretions or masses
Effervescence: slight to strong

Reaction: slightly alkaline or moderately alkaline

BCk horizon

Hue: 10YR to 5Y
Value: 5 to 7
Chroma: 1 to 4
Texture: silty clay or clay
Clay content: 40 to 50 percent
Redox concentrations: amount—0 to 2 percent; shades—brown or yellow
Iron manganese concretions: amount—0 to 2 percent
Identifiable secondary calcium carbonate: amount—1 to 3 percent; kind—concretions or masses
Effervescence: slight to strong
Reaction: slightly alkaline or moderately alkaline

Coy Series

The Coy series consists of very deep, well drained, slowly permeable soils that developed in clayey calcareous alluvium derived from mudstone. These soils are on nearly level to moderately sloping terraces and broad flats associated with drainageways. Slope ranges from 1 to 5 percent. Soils of the Coy series are fine, smectitic, hyperthermic Pachic Vertic Argiustolls.

Typical pedon of Coy clay loam in an area of Coy clay loam, 1 to 3 percent slopes; from the intersection of Farm Road 883 and Farm Road 2442 on the west side of the county, 3.8 miles northeast on Farm Road 2442 to private road, 0.6 mile north and east on private road to a ranch road that is about 450 feet north of the ranch headquarters, 0.5 mile east on ranch road to intersection of northeast running road, about 0.5 mile northeast on road to southeast running road, 0.1 mile southeast on road, and 20 feet north in rangeland. Berclair NW USGS topographic quadrangle; Latitude: 28 degrees 40 minutes 48.60 seconds North; Longitude: 97 degrees 40 minutes 7.00 seconds West; NAD 83.

A—0 to 15 centimeters (0 to 6 inches); very dark gray (10YR 3/1) clay loam, black (10YR 2/1), moist; moderate fine subangular blocky structure; firm, very hard, moderately sticky, moderately plastic; many very fine and fine roots and common medium roots; 2 percent fine carbonate concretions; very slightly effervescent; slightly alkaline; clear smooth.

Bt—15 to 36 centimeters (6 to 14 inches); grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2), moist; moderate fine subangular blocky structure; firm, hard, moderately sticky, moderately plastic; many very fine and fine roots; 1 percent fine carbonate concretions; 2 percent nonflat subrounded 5 to 15 millimeter in size chert fragments; slightly alkaline; gradual wavy.

Btk1—36 to 61 centimeters (14 to 24 inches); light brown (7.5YR 6/3) clay, brown (7.5YR 5/3), moist; moderate fine prismatic structure parting to moderate fine and medium blocky structure; very firm, very hard, very sticky, very plastic; many very fine and fine roots; 3 percent distinct organic stains; 10 percent faint dark brown (7.5YR 3/2) pressure faces; 2 percent fine carbonate concretions; 5 percent fine and medium carbonate masses; moderately alkaline; gradual wavy.

Btk2—61 to 84 centimeters (24 to 33 inches); 50 percent light brownish gray (10YR 6/2) and 50 percent light brown (7.5YR 6/4) clay, 50 percent light brownish gray (10YR 6/2) and 50 percent brown (7.5YR 5/4), moist; moderate fine and medium angular blocky structure; firm, hard, moderately sticky, moderately plastic; common very fine and fine roots; 3 percent distinct dark brown (7.5YR 3/2) organic stains; 10 percent faint pressure faces; 5 percent fine and medium distinct yellowish red (5YR 5/6) masses of oxidized iron with clear boundaries; 5 percent fine carbonate concretions; 10 percent fine and medium distinct carbonate masses; moderately alkaline; gradual wavy.

Bk—84 to 127 centimeters (33 to 50 inches); reddish yellow (7.5YR 6/6) clay, strong brown (7.5YR 5/6), moist; 15 percent fine distinct light brownish gray (10YR 6/2) mottles; moderate fine to coarse angular blocky structure; firm, hard, moderately sticky, moderately plastic; 3 percent faint dark brown (7.5YR 3/2) organic stains on horizontal faces of peds; 25 percent fine and medium carbonate masses; 10 percent medium and coarse carbonate concretions; moderately alkaline; gradual wavy.

BC—127 to 203 centimeters (50 to 80 inches); 70 percent light brown (7.5YR 6/4) and 30 percent light gray (10YR 7/2) clay, 70 percent brown (7.5YR 5/4) and 30 percent light brownish gray (10YR 6/2), moist; massive; firm, hard, moderately sticky, moderately plastic; 10 percent carbonate masses; 5 percent fine carbonate concretions; strongly alkaline.

A horizon

Hue: 10YR
Value: 2 to 4
Chroma: 1 or 2
Texture: sandy clay loam, clay loam, or clay
Clay content: 25 to 45 percent
Silt content: 25 to 35 percent
Effervescence: very slightly or slight
Reaction: slightly alkaline or moderately alkaline

Bt horizon

Hue: 10YR
Value: 3 to 6
Chroma: 1 to 4
Texture: clay loam or clay
Clay content: 35 to 60 percent
Identifiable secondary calcium carbonate: amount—0 to 3 percent; kind—masses, threads, and nodules; location—throughout
Effervescence: slight or strong
Reaction: slightly alkaline or moderately alkaline

Btk horizon

Hue: 7.5YR or 10YR
Value: 3 to 6
Chroma: 1 to 4
Texture: clay loam or clay
Clay content: 35 to 60 percent
Identifiable secondary calcium carbonate: amount—3 to 10 percent; kind—masses, threads, and nodules; location—throughout
Effervescence: slight or strong
Reaction: slightly alkaline or moderately alkaline

Bk or Bky horizon

Hue: 7.5YR or 10YR
Value: 5 to 7
Chroma: 2 to 6
Texture: silty clay or clay
Clay content: 40 to 60 percent

Identifiable secondary calcium carbonate: amount—0 to 10 percent; kind—masses and nodules; location—throughout
Gypsum content: amount—0 to 5 percent; kind—threads and films; location—throughout
Effervescence: slight to violent
Reaction: slightly alkaline or moderately alkaline

BC horizon

Hue: 7.5YR to 2.5Y
Value: 5 to 7
Chroma: 2 to 6
Texture: silty clay or clay
Clay content: 40 to 60 percent
Identifiable secondary calcium carbonate: amount—1 to 15 percent; kind—masses, films, and nodules; location—throughout
Gypsum content: amount—0 to 10 percent; kind—threads and films; location—throughout
Effervescence: slight to violent
Reaction: slightly alkaline or moderately alkaline

Dacosta Series

The Dacosta series consists of very deep, moderately well drained soils, that formed in clayey fluviomarine deposits derived from the Beaumont Formation of Pleistocene age. These nearly level to gently sloping soils are on flats on coastal plains. Slope is 0 to 1 percent, but is mainly less than 1 percent. Soils of the Dacosta series are fine, smectitic, hyperthermic Vertic Argiudolls.

Typical pedon of Dacosta sandy clay loam in an area of Dacosta sandy clay loam, 0 to 1 percent slopes; from the intersection of U.S. Highway 59 and Farm Road 2506 in Fannin, 4 miles south on Farm Road 2506, and 100 feet north in pasture. Fannin USGS topographic quadrangle; Latitude: 28 degrees 39 minutes 13.60 seconds North; Longitude: 97 degrees 13 minutes 42.00 seconds West; NAD 83.

A—0 to 20 centimeters (0 to 8 inches); very dark brown (10YR 2/2) sandy clay loam, very dark grayish brown (10YR 3/2), dry; weak fine subangular blocky structure; friable, hard; common very fine and fine roots; common very fine tubular pores; 2 percent fine black (10YR 2/1) insect casts; neutral; clear smooth boundary.

Bt1—20 to 49 centimeters (8 to 19 inches); black (10YR 2/1) clay, black (10YR 2/1), dry; moderate medium prismatic structure parting to moderate fine and medium angular blocky; very firm, very hard; common very fine and fine roots; common very fine tubular pores; 10 percent faint black (10YR 2/1) clay films; 40 percent prominent pressure faces; 1 percent fine black (10YR 2/1) insect casts; neutral; gradual wavy boundary.

Bt2—49 to 97 centimeters (19 to 38 inches); dark gray (10YR 4/1) clay loam, dark gray (10YR 4/1), dry; moderate medium prismatic structure parting to moderate medium angular blocky; firm, very hard; common very fine and fine roots; few very fine tubular pores; 10 percent distinct black (10YR 2/1) clay films; 25 percent distinct pressure faces; 1 percent fine pale brown (10YR 6/3) insect casts; slightly alkaline; clear wavy boundary.

Btk1—97 to 130 centimeters (38 to 51 inches); 60 percent gray (10YR 5/1) and 40 percent grayish brown (10YR 5/2) clay loam, 60 percent gray (10YR 5/1) and 40 percent grayish brown (10YR 5/2), dry; moderate medium and coarse prismatic structure parting to moderate medium angular blocky; firm, very hard; common very fine and fine roots; few very fine tubular pores; 2 percent distinct black (10YR 2/1) clay films on vertical faces of peds; 10 percent distinct grayish brown (10YR 5/2) clay films; 1 percent fine pale brown (10YR 6/3) insect casts; 3 percent fine carbonate nodules; 1 percent fine carbonate masses with hard pitted centers; very slightly effervescent; slightly alkaline; gradual wavy boundary.

Btk2—130 to 152 centimeters (51 to 60 inches); 45 percent pale brown (10YR 6/3) and 40 percent brown (10YR 5/3) and 15 percent light yellowish brown (2.5Y 6/4) clay loam, 45 percent pale brown (10YR 6/3) and 40 percent brown (10YR 5/3) and 15 percent light yellowish brown (2.5Y 6/4), dry; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm, very hard; few fine roots; 5 percent distinct dark gray (10YR 4/1) clay films on vertical faces of peds; 2 percent fine carbonate nodules; 2 percent fine and medium carbonate masses with hard pitted centers; very slightly effervescent; moderately alkaline; gradual wavy boundary.

Btk3—152 to 196 centimeters (60 to 77 inches); light yellowish brown (10YR 6/4) clay loam, very pale brown (10YR 7/4), dry; weak coarse subangular blocky structure; firm, very hard; 5 percent distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds and 10 percent distinct pressure faces; 1 percent fine distinct light gray (10YR 7/1) iron depletions with sharp boundaries on horizontal faces of peds; 2 percent fine and medium distinct yellow (10YR 7/8) masses of oxidized iron with sharp boundaries in matrix; 2 percent fine and medium carbonate masses; very slightly effervescent; moderately alkaline; gradual wavy boundary.

2C—196 to 203 centimeters (77 to 80 inches); brownish yellow (10YR 6/6) clay, brownish yellow (10YR 6/6), dry; weak very coarse subangular blocky structure; very firm, very hard; 15 percent distinct pressure faces; 1 percent fine prominent black (7.5YR 2.5/1) manganese coatings on faces of peds; 2 percent fine faint brownish yellow (10YR 6/8) masses of oxidized iron in matrix surrounding redox depletions; 2 percent fine and medium distinct light gray (2.5Y 7/2) iron depletions on vertical faces of peds; very slightly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 2 or 3
Chroma: 1 or 2
Texture: sandy clay loam
Clay content: 20 to 35 percent
Redox concentrations: amount—0 to 2 percent; shades—brown
Iron manganese concretions: amount—0 to 2 percent; size—4 to 10 millimeters; shades—black
EC: 0 to 1
SAR: 0 to 4
Reaction: slightly acid or neutral

Upper Bt horizon

Hue: 10YR
Value: 2 to 3
Chroma: 1
Texture: sandy clay loam, clay loam, or clay
Clay content: 30 to 45 percent
Redox concentrations: amount—0 to 2 percent; shades—brown
Iron manganese concretions: amount—0 to 2 percent; size—4 to 10 millimeters; shades—black
EC: 0.2 to 1
SAR: 2 to 6
Reaction: slightly acid to slightly alkaline

Lower Bt horizon

Hue: 10YR or 2.5Y
Value: 2 to 5
Chroma: 1 or 2
Texture: sandy clay, clay loam or clay
Clay content: 35 to 55 percent
Redox concentrations: amount—0 to 2 percent; shades—brown
Iron manganese concretions: amount—0 to 2 percent; size—4 to 10 millimeters; shades—black
Identifiable secondary calcium carbonate: amount—0 to 5 percent; kind—concretions, threads, or masses
EC: 2 to 6
SAR: 6 to 12
Reaction: slightly acid to slightly alkaline

Btk horizon (where present)

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 to 4
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 22 to 45 percent
Redox concentrations: amount—0 to 5 percent; shades—yellow, brown, or red
Iron depletions: amount—0 to 2 percent; shades—gray
Iron manganese concretions: amount—0 to 2 percent; size—4 to 10 millimeters; shades—black
Identifiable secondary calcium carbonate: amount—0 to 8 percent; kind—concretions, threads, or masses
EC: 2 to 6
SAR: 6 to 12
Effervescence: none to slight
Reaction: neutral to moderately alkaline

2C horizon (where present, typically below 152 centimeters [60 inches])

Hue: 2.5YR to 7.5YR
Value: 5 to 7
Chroma: 4 to 6
Texture: loam, sandy clay loam, clay loam, or clay
Other features: These layers contain few fine flakes of mica in some pedons.
Effervescence: none to slight
Reaction: neutral to moderately alkaline

Denhawken Series

The Denhawken series consists of very deep, well drained soils that formed in clayey material weathered from shale. These nearly level to gently sloping soils are on hillslopes on inland dissected coastal plains. Slope ranges from 1 to 3 percent. Soils of the Denhawken series are fine, smectitic, hyperthermic Vertic Haplustepts.

Typical pedon of Denhawken clay loam in an area of Elmendorf-Denhawken complex, 1 to 3 percent slopes; from the intersection of U.S. Highway 183 and Farm Road 1961, 1.1 miles north on U.S. Highway 183 to Duderstadt Road, 0.9 mile southeast on Duderstadt Road to private road, 0.3 mile east on private road, and 200 feet south in cropland. Ander USGS topographic quadrangle; Latitude: 28 degrees 52 minutes 19.76 seconds North; Longitude: 97 degrees 20 minutes 46.72 seconds West; NAD 83.

Ap—0 to 15 centimeters (0 to 6 inches); dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1), moist; moderate medium subangular blocky structure; hard, firm; few very fine roots; few very fine tubular pores; few fine carbonate nodules; strongly effervescent; slightly alkaline; clear smooth boundary.

Bk1—15 to 35 centimeters (6 to 14 inches); grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2), moist; moderate medium subangular blocky structure; hard, firm; few very fine roots; few very fine tubular pores; 5 percent faint pressure faces; 2 percent fine carbonate nodules; strongly effervescent; slightly alkaline; gradual wavy boundary.

Bk2—35 to 63 centimeters (14 to 25 inches); pale brown (10YR 6/3) clay loam, pale brown (10YR 6/3), moist; moderate medium subangular blocky structure; very hard, very firm; few distinct pressure faces; 15 percent medium carbonate masses; strongly effervescent; slightly alkaline; gradual wavy boundary.

Bk3—63 to 86 centimeters (25 to 34 inches); very pale brown (10YR 7/3) clay loam, pale brown (10YR 6/3), moist; 1 percent fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very hard, very firm; 10 percent medium carbonate masses; violently effervescent; slightly alkaline; gradual wavy boundary.

Bk4—86 to 104 centimeters (34 to 41 inches); very pale brown (10YR 7/3) clay loam, pale brown (10YR 6/3), moist; 2 percent fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very hard, very firm; 5 percent medium carbonate masses; violently effervescent; moderately alkaline; gradual wavy boundary.

BCky1—104 to 132 centimeters (41 to 52 inches); light gray (10YR 7/2) clay loam, light gray (10YR 7/2), moist; weak fine subangular blocky structure; very hard, very firm; 20 percent medium carbonate masses and 10 percent coarse carbonate masses; violently effervescent; moderately alkaline; gradual wavy boundary.

BCky2—132 to 203 centimeters (52 to 80 inches); yellowish brown (10YRYR 5/4) clay loam, light yellowish brown (10YR 6/4), moist; massive; 4 percent light gray (10YR 7/1) clay as layers 0.5 to 2 centimeters thick; 2 percent gypsum crystals; 10 percent medium carbonate masses and 5 percent coarse carbonate masses; strongly effervescent; moderately alkaline.

A horizon

Hue: 10YR or 2.5Y
Value: 2 to 4
Chroma: 1 or 2
Texture: clay loam
Effervescence: very slight to strong
Reaction: slightly alkaline or moderately alkaline

Bk horizon

Hue: 2.5Y to 10YR
Value: 5 to 7
Chroma: 2 to 6
Texture: clay loam or clay
Clay content: 35 to 55 percent
Calcium carbonate equivalent: 10 to 35 percent
Gypsum: 0 to 5 percent
Effervescence: slight to strong
Reaction: slightly alkaline or moderately alkaline

BCk or BCky horizon

Hue: 10YR or 2.5Y
Value: 4 to 7
Chroma: 2 to 4
Texture: clay loam or clay
Clay content: 35 to 50 percent
Calcium carbonate equivalent: 15 to 35 percent
Gypsum: 0 to 5 percent
Effervescence: very slight to strong
Reaction: slightly alkaline or moderately alkaline

Cky horizon (where present)

Variegated Matrix
Hue: 7.5YR to 2.5Y
Value: 3 to 8
Chroma: 1 to 6
Texture: clay loam or clay
Clay content: 35 to 50 percent
Selenite crystals: 1 to 15 percent
Effervescence: very slight to strong
Reaction: slightly alkaline or moderately alkaline

Devine Series

The Devine series consists of very deep, well drained soils that formed in loamy sediments mixed with thick beds of Uvalde Gravel of Quaternary age. These nearly level to strongly sloping soils are on high stream terraces. Slope ranges from 1 to 5 percent. Soils of the Devine series are clayey-skeletal, mixed, active, hyperthermic Typic Paleustalfs.

Typical pedon of Devine very gravelly fine sandy loam in an area of, Devine very gravelly fine sandy loam, 1 to 5 percent slopes; from the intersection of intersection Farm Road 1351 and U.S. Highway 59 southwest of Goliad, 0.7 mile northeast on U.S. Highway 59 to private road, 1 mile south on private road, and 50 feet west in rangeland. Melo USGS topographic quadrangle; Latitude: 28 degrees, 37 minutes, 14.70 seconds North; Longitude: 97 degrees, 26 minutes, 38.40 seconds West; NAD 83.

A—0 to 25 centimeters (0 to 10 inches); grayish brown (10YR 5/2) very gravelly fine sandy loam, dark grayish brown (10YR 4/2), moist; weak medium subangular blocky structure parting to weak fine granular; common fine roots and many very fine roots; 35 percent chert fragments; moderately acid; abrupt wavy boundary.

Bt1—25 to 38 centimeters (10 to 15 inches); brown (7.5YR 4/3) very gravelly sandy clay, brown (7.5YR 4/3), moist; weak medium angular blocky structure; common coarse roots and common very fine roots; 5 percent fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron with clear boundaries ion matrix; 13 percent fine prominent red (2.5YR 4/6) masses of oxidized iron with sharp boundaries; 2 percent fine salt crystals; 50 percent chert fragments; slightly acid; clear wavy boundary.

Bt2—38 to 66 centimeters (15 to 26 inches); brown (7.5YR 5/3) very gravelly clay, brown (7.5YR 4/3), moist; moderate medium angular blocky structure; common fine and very fine roots; 2 percent distinct dark grayish brown (10YR 4/2) organic stains lining pores; 3 percent fine prominent yellowish red (5YR 5/8) masses of oxidized iron with clear boundaries in matrix; 5 percent fine and medium distinct strong brown (7.5YR 5/8) masses of oxidized iron with clear boundaries; 2 percent fine distinct yellowish brown (10YR 5/8) masses of oxidized iron; 3 percent fine salt crystals; 45 percent chert fragments; slightly acid; clear wavy boundary.

Bt3—66 to 94 centimeters (26 to 37 inches); strong brown (7.5YR 5/6) very gravelly clay, strong brown (7.5YR 4/6), moist; moderate medium angular blocky structure; common very fine roots; 3 percent distinct dark gray (10YR 4/1) clay films; 5 percent distinct black (10YR 2/1) organic stains; 10 percent fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron with sharp boundaries in matrix; 3 percent fine and medium distinct brown (10YR 5/3) masses of oxidized iron with sharp boundaries in matrix; 3 percent fine carbonate masses; 40 percent chert fragments; neutral; clear smooth boundary.

Bt4—94 to 119 centimeters (37 to 47 inches); brown (7.5YR 5/4) gravelly clay, brown (7.5YR 4/4), moist; moderate medium angular blocky structure; common very fine roots; 5 percent distinct very dark gray (10YR 3/1) organic stains; 15 percent fine prominent red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; 5 percent fine carbonate masses; 15 percent chert fragments; slightly alkaline; clear smooth boundary.

Btk—119 to 135 centimeters (47 to 53 inches); strong brown (7.5YR 5/6) gravelly sandy clay, strong brown (7.5YR 4/6), moist; moderate medium subangular blocky structure; 2 percent distinct very dark grayish brown (10YR 3/2) organic stains and 10 percent distinct yellowish red (5YR 5/6), dry, clay films; 8 percent fine carbonate masses; 30 percent chert fragments; slightly alkaline; clear smooth boundary.

2C—135 to 203 centimeters (53 to 80 inches); white (10YR 8/1) loam, white (10YR 8/1), moist; massive; 5 percent fine and medium faint very pale brown (10YR 8/4) mottles; slightly alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 6; when moist chroma or value is 3 or less, thickness is less than 25 centimeters (10 inches)
Chroma: 2 to 4
Texture: very gravelly fine sandy loam
Coarse fragments: amount—35 to 80 percent by volume; kind—rounded chert or quartzite; size—pebbles and cobbles
Reaction: moderately acid to neutral

E horizon (where present)

Hue: 7.5YR to 10YR
Value: 4 to 6
Chroma: 3 or 4
Texture: very gravelly or extremely gravelly, sandy loam, fine sandy loam, or loam
Coarse fragments: amount—35 to 80 percent by volume; kind—rounded chert or quartzite; size—pebbles and cobbles
Reaction: moderately acid to neutral

Bt horizon

Hue: 5YR or 7.5YR
Value: 3 to 8
Chroma: 3 to 6
Texture: very gravelly clay loam, very gravelly clay, or very gravelly sandy clay
Clay content: 35 to 50 percent
Redox concentrations: amount—0 to 15 percent; shades—yellow, brown, or red
Redox depletions: amount—0 to 25 percent; shades—gray
Coarse fragments: amount—40 to 80 percent by volume; location—mainly in upper 50 centimeters (20 inches)
Reaction: moderately acid to slightly alkaline

Btk horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 4 to 8
Texture: very gravelly clay loam, very gravelly clay, or very gravelly sandy clay
Identifiable secondary calcium carbonate: amount—2 to 10 percent; kind—masses, threads, or concretions
Coarse fragments: 15 to 50 percent by volume
Partially weathered shale or sandstone: amount—0 to 20 percent
Reaction: neutral to slightly alkaline

2C horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 4 to 8
Texture: loam or sandy clay loam
Identifiable secondary calcium carbonate: amount—0 to 10 percent; kind—masses, threads, or concretions

Edna Series

The Edna series consists of very deep, somewhat poorly drained soils that formed in loamy fluviomarine deposits derived from the Beaumont Formation of Pleistocene age. These nearly level to gently sloping soils are on ancient meander ridges. Slope is 0 to 1 percent, but most less than 1 percent. Soils of the Edna series are fine, smectitic, hyperthermic Aquertic Chromic Hapludalfs.

Typical pedon of Edna fine sandy loam in an area of Edna fine sandy loam, 0 to 1 percent slopes; from the intersection of U.S. Highway 59 and Farm Road 2506, 1.5 miles east on U.S. Highway 59 to private road, 1.3 miles south across railroad tracks on private road to gate, 0.2 mile south on ranch road to gate, 0.75 mile south on ranch road to pipeline right-of-way, 0.15 mile east on right-of-way, and 30 feet south in rangeland. Fannin USGS topographic quadrangle; Latitude: 28 degrees 39 minutes 59.30 seconds North; Longitude: 97 degrees 13 minutes 14.00 seconds West; NAD 83.

A—0 to 23 centimeters (0 to 9 inches); dark grayish brown (10YR 4/2) fine sandy loam, grayish brown (10YR 5/2), dry; moderate medium subangular blocky structure; friable, hard; many fine roots and very fine roots; 10 percent distinct light brownish gray (10YR 6/2) sand coats on all faces of peds; 1 percent fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron with diffuse boundaries lining pores; 1 percent fine distinct black (10YR 2/1) wormcasts; neutral; abrupt wavy boundary.

Bt1—23 to 53 centimeters (9 to 21 inches); dark gray (10YR 4/1) clay, dark gray (10YR 4/1), dry; moderate medium and coarse prismatic structure parting to moderate fine and medium angular blocky; very firm, very hard; common fine roots and very fine roots; 3 percent distinct grayish brown (10YR 5/2) sand coats on all faces of peds; 10 percent faint clay films on all faces of peds; 2 percent fine prominent dark yellowish brown (10YR 4/6) masses of oxidized iron with clear boundaries lining pores; neutral; gradual smooth boundary.

Bt2—53 to 76 centimeters (21 to 30 inches); dark gray (10YR 4/1) clay, gray (10YR 5/1), dry; moderate medium prismatic structure parting to moderate medium angular blocky; very firm, very hard; common fine roots and very fine roots; 5 percent distinct grayish brown (10YR 5/2) sand coats on all faces of peds; 10 percent faint clay films on all faces of peds; 2 percent fine prominent dark yellowish brown (10YR 4/6) masses of oxidized iron with clear boundaries lining pores; neutral; clear wavy boundary.

Bt3—76 to 104 centimeters (30 to 41 inches); grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2), dry; moderate fine and medium subangular blocky structure; firm, slightly hard; few very fine roots; 2 percent distinct dark gray (10YR 4/1) organic stains on vertical faces of peds and 5 percent distinct grayish brown (10YR 5/2) sand coats on all faces of peds; 10 percent faint clay films on all faces of peds; 1 percent fine distinct dark yellowish brown (10YR 4/4) masses of oxidized iron with sharp boundaries lining pores; neutral; clear smooth boundary.

Bt4—104 to 127 centimeters (41 to 50 inches); light yellowish brown (2.5Y 6/3) clay loam, pale yellow (2.5Y 7/3), dry; moderate fine and medium subangular blocky structure; firm, slightly hard; 2 percent distinct dark gray (10YR 4/1) organic stains on vertical faces of peds; 5 percent faint clay films on all faces of peds; 1 percent fine prominent reddish yellow (7.5YR 6/8) masses of oxidized iron with sharp boundaries in matrix; 1 percent fine prominent yellowish red (5YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 2 percent fine distinct light yellowish brown (10YR 6/4) masses of oxidized iron with clear boundaries in matrix; 3 percent fine and medium prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 2 percent fine carbonate nodules in matrix; slightly alkaline; clear smooth boundary.

Btk1—127 to 160 centimeters (50 to 63 inches); grayish brown (2.5Y 5/2) sandy clay loam, light brownish gray (2.5Y6/2), dry; weak fine subangular blocky structure; firm, slightly hard; 1 percent distinct dark gray (10YR 4/1) organic stains on all faces of peds; 1 percent fine distinct yellowish brown (10YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 2 percent fine prominent red (2.5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; 2 percent fine and medium prominent strong brown (7.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; slightly alkaline; clear smooth boundary.

Btk2—160 to 203 centimeters (63 to 80 inches); light olive brown (2.5Y 5/3) sandy clay loam, light yellowish brown (2.5Y 6/3), dry; weak fine and medium subangular blocky structure; firm, slightly hard; 1 percent distinct dark gray (10YR 4/1) organic stains on all faces of peds; 1 percent fine prominent red (2.5YR 4/6)masses of oxidized iron with sharp boundaries in matrix; 1 percent fine prominent yellowish red (5YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 2 percent fine distinct yellowish brown (10YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 3 percent fine and medium distinct light yellowish brown (10YR 6/4) masses of oxidized iron with clear boundaries in matrix; moderately alkaline.

A horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: fine sandy loam
Redox concentrations: amount—0 to 2 percent; shades—brown or yellow
Reaction: strongly acid to neutral

Upper Bt horizon

Hue: 10YR to 5Y
Value: 4 to 7
Chroma: 1 or 2
Texture: clay loam or clay
Clay content: 35 to 55 percent

Redox concentrations: amount—2 to 15 percent; size—fine or medium; shades—red, brown, yellow, or olive
Reaction: moderately acid to neutral

Lower Bt horizon

Hue: 10YR to 5Y
Value: 4 to 7
Chroma: 1 to 3
Texture: sandy clay loam, clay loam, or clay
Clay content: 35 to 40 percent
Redox concentrations: amount—2 to 15 percent; size—fine or medium; shades—red, brown, yellow, or olive
Reaction: neutral to moderately alkaline

Btk horizon

Hue: 10YR to 5Y
Value: 4 to 7
Chroma: 1 to 3
Texture: sandy clay loam, clay loam, or clay
Clay content: 30 to 40 percent
Redox concentrations: amount—2 to 15 percent; size—fine or medium; shades—red, brown, yellow, or olive
Identifiable secondary calcium carbonate: amount—1 to 8 percent, nodules, concretions, or masses
Reaction: slightly alkaline or moderately alkaline

Edroy Series

The Edroy series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey over loamy fluviomarine deposits of Pleistocene age. These nearly level soils are in enclosed depressions. Slope is 0 to 1 percent. Soils of the Edroy series are fine, smectitic, hyperthermic Ustic Epiaquerts.

Typical pedon of Edroy clay in an area of Edroy clay, 0 to 1 percent slope; from the intersection of Texas Highway 70 and Texas Highway 892 east of Bishop in Nueces County, about 1.3 miles west on Texas Highway 70, 1 mile south on private farm road, and 30 feet south in depression in Kleberg County. Concordia USGS topographic quadrangle; Latitude: 27 degrees, 33 minutes, 32 seconds North; Longitude: 97 degrees, 41 minutes, 2.8 seconds West; NAD 83.

Ap—0 to 18 centimeters (0 to 7 inches); black (2.5Y 2.5/1) clay, very dark gray (10YR 3/1), dry; weak fine subangular blocky and moderate medium granular structure; very hard, firm; few very fine roots; common fine vesicular pores; neutral; clear smooth boundary.

Bw—18 to 46 centimeters (7 to 18 inches); black (2.5Y 2.5/1) clay, very dark gray (10YR 3/1), dry; moderate medium angular blocky structure; very hard, firm; few very fine tubular pores; 1 percent faint pressure faces; 1 percent faint sand coats on vertical faces of peds; 1 percent fine prominent spherical dark brown (7.5YR 3/2) iron-manganese nodules; 1 percent fine prominent strong brown (7.5YR 4/6) masses of iron-manganese with sharp boundaries lining pores; neutral; gradual smooth boundary.

Bss1—46 to 104 centimeters (18 to 41 inches); very dark gray (2.5Y 3/1) clay, dark gray (10YR 4/1), dry; moderate medium angular blocky structure; very hard, very firm; few very fine tubular pores; 5 percent faint pressure faces; 15 percent faint slickensides; 1 percent faint sand coats on vertical faces of peds; 1 percent fine prominent dark brown (7.5YR 3/3) masses of iron-manganese with sharp boundaries in matrix; neutral; gradual wavy boundary.

Bss2—104 to 145 centimeters (41 to 57 inches); 80 percent dark gray (10YR 4/1) and 20 percent very dark gray (10YR 3/1) clay, 80 percent gray (10YR 5/1) and 20 percent dark gray (10YR 4/1), dry; moderate coarse subangular blocky structure; very hard, very firm; 10 percent faint pressure faces; 10 percent distinct slickensides; 1 percent fine faint black (10YR 2/1) masses of iron-manganese with sharp boundaries in matrix; slightly alkaline; gradual wavy boundary.

Bkss—145 to 178 centimeters (57 to 70 inches); 90 percent light gray (2.5Y 7/2) and 10 percent dark gray (10YR 4/1) clay, 90 percent light gray (2.5Y 7/2) and 10 percent gray (10YR 5/1), dry; weak very coarse subangular blocky structure; very hard, very firm; 1 percent faint pressure faces; 5 percent distinct slickensides; 1 percent fine distinct black (10YR 2/1) masses of iron-manganese with sharp boundaries in matrix; 1 percent fine masses of calcium carbonate; 1 percent fine weakly cemented nodules of calcium carbonate; moderately alkaline; wavy boundary.

2Bk—178 to 203 centimeters (70 to 80 inches); pale yellow (2.5Y 7/3) sandy clay loam, pale yellow (2.5Y 7/3), dry; massive; hard, firm; 3 percent fine and medium masses of calcium carbonate; 1 percent fine and medium weakly cemented nodules of calcium carbonate; slightly effervescent; moderately alkaline.

A horizon

Hue: 10YR or 2.5Y
Value: 2 to 4
Chroma: 1
Texture: clay loam, sandy clay, or clay
Clay content: 35 to 45 percent
Redox concentrations: amount—0 to 2 percent; shades—brown
Iron-manganese concentrations: amount—0 to 1 percent; kind—nodules
EC (dS/m): 0 to 2
SAR: 0 to 2
Reaction: slightly acid or neutral

Bw horizon

Hue: 10YR or 2.5Y
Value: 2 to 4
Chroma: 1 or 2
Texture: clay loam, sandy clay, or clay
Clay content: 35 to 45 percent
Redox concentrations: amount—0 to 5 percent; shades—brown
Redox depletions: amount—0 to 2 percent; shades—gray
Iron-manganese concentrations: amount—0 to 2 percent; kind—nodules
EC (dS/m): 0 to 2
SAR: 0 to 4
Reaction: neutral or slightly alkaline

Bss horizon

Hue: 10YR or 2.5Y
Value: 2 to 5
Chroma: 1 or 2
Texture: clay
Clay content: 40 to 55 percent
Redox concentrations: amount—0 to 5 percent; shades—brown
Redox depletions: amount—0 to 2 percent; shades—gray

Iron-manganese concentrations: amount—0 to 2 percent; kind—nodules
EC (dS/m): 0 to 2
SAR: 0 to 8
Reaction: neutral to moderately alkaline

Bkss horizon

Hue: 10YR or 2.5Y
Value: 4 to 7
Chroma: 1 or 2
Texture: clay
Clay content: 40 to 55 percent
Redox concentrations: amount—0 to 5 percent; shades—brown
Redox depletions: amount—0 to 2 percent; shades—gray
Iron-manganese concentrations: amount—0 to 2 percent; kind—nodules
Identifiable secondary calcium carbonate: amount—0 to 5 percent; kind—masses or nodules
EC (dS/m): 0 to 4
SAR: 2 to 8
Effervescence: none to strong
Reaction: slightly alkaline or moderately alkaline

2Bk horizon (where present)

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 to 3
Texture: fine sandy loam or sandy clay loam
Clay content: 15 to 30 percent
Redox concentrations: amount—0 to 5 percent; shades—brown
Redox depletions: amount—0 to 2 percent; shades—gray
Iron-manganese concentrations: amount—0 to 2 percent; kind—nodules
Identifiable secondary calcium carbonate: amount—0 to 5 percent; kind—masses or nodules
EC (dS/m): 0 to 2
SAR: 2 to 14
Effervescence: none to strong
Reaction: slightly alkaline or moderately alkaline

Elmendorf Series

The Elmendorf series consists of very deep, well drained soils that formed in calcareous, clayey residuum weathered from shale. These soils are on nearly level to gently sloping uplands. Slope ranges from 1 to 3 percent. Soils of the Elmendorf series are fine, smectitic, hyperthermic Pachic Vertic Argiustolls.

Typical pedon of Elmendorf sandy clay loam in an area of Elmendorf-Denhawken complex, 1 to 3 percent slopes; from the intersection of U.S. Highway 183 and Farm Road 1961, 1.1 miles north on U.S. Highway 183 to Duderstadt Road, 0.9 mile southeast on Duderstadt Road to private road, 0.3 mile east on private road, and 200 feet south in cropland. Ander USGS topographic quadrangle; Latitude: 28 degrees, 52 minutes, 19.76 seconds North; Longitude: 97 degrees, 20 minutes, 45.83 seconds West; NAD 83.

Ap—0 to 15 centimeters (0 to 6 inches); very dark gray (10YR 3/1) sandy clay loam, very dark gray (10YR 3/1), moist; moderate medium subangular blocky structure; slightly hard; friable; few very fine roots; few fine interstitial pores; slightly alkaline; clear wavy boundary.

Bt1—15 to 41 centimeters (6 to 16 inches); very dark gray (10YR 3/1) clay loam, black (10YR 2/1), moist; moderate medium subangular blocky structure; few very fine roots; few very fine tubular pores; common black (10YR 2/1) clay films; few distinct pressure faces; slightly alkaline; gradual wavy boundary.

Bt2—41 to 66 centimeters (16 to 26 inches); very dark gray (10YR 3/1) sandy clay, black (10YR 2/1), moist; moderate medium subangular blocky structure; few very fine roots; few very fine tubular pores; common black (10YR 2/1) clay films; few distinct pressure faces; few very dark gray (10YR 3/1) infilled cracks 1 to 2 centimeters wide; slightly alkaline; gradual wavy boundary.

Btk1—66 to 81 centimeters (26 to 32 inches); grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2), moist; moderate medium subangular blocky structure; hard, firm; few very fine roots; few very fine tubular pores; common distinct black (10YR 2/1) clay films; few distinct pressure faces; few very dark gray (10YR 3/1) infilled cracks up to 1 centimeter wide; 3 percent fine carbonate concretions; strongly effervescent; slightly alkaline; gradual wavy boundary.

Btk2—81 to 114 centimeters (32 to 45 inches); pale brown (10YR 6/3) clay loam, brown (10YR 5/3, moist; moderate medium subangular blocky structure; hard, firm; few distinct dark grayish brown (10YR 4/2) clay films; few very dark gray (10YR 3/1) infilled cracks up to 1 centimeter wide; 5 percent fine carbonate concretions; strongly effervescent; moderately alkaline; gradual wavy boundary.

Btk3—114 to 140 centimeters (45 to 55 inches); light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4), moist; moderate medium subangular blocky structure; very hard, firm; few distinct grayish brown (10YR 5/2) clay films; 10 percent medium carbonate masses; strongly effervescent; moderately alkaline; gradual wavy boundary.

Ck—140 to 203 centimeters (55 to 80 inches); pink (7.5YR 7/3) clay, light brown (7.5YR 6/3), moist; 5 percent fine and medium distinct light gray (10YR 7/1) mottles; massive; very hard, very firm; 5 percent medium carbonate masses; strongly effervescent; moderately alkaline.

A horizon

Hue: 10YR or 2.5Y
Value: 2 to 4
Chroma: 1 or 2
Texture: sandy clay loam
Reaction: slightly acid to slightly alkaline

Bt horizon

Hue: 10YR or 2.5Y
Value: 2 to 4
Chroma: 1 or 2
Texture: clay loam or clay
Clay content: 35 to 50 percent *(upper 50 centimeters [20 in] of Bt)*
Reaction: slightly acid to slightly alkaline

Btk horizon

Hue: 10YR, 5Y, or 2.5Y
Value: 4 to 6
Chroma: 1 to 6
Texture: clay loam or clay
Clay content: 35 to 55 percent
Redox concentrations: amount—0 to 2 percent; shades—red, brown, yellow, or gray
Identifiable secondary calcium carbonate: amount—2 to 10 percent; kind—films and threads, masses, or cemented nodular concretions

Effervescence: very slight to strong
Reaction: neutral to moderately alkaline

C horizon (where present)

Color: shades of gray, pink, brown, and yellow
Texture: clayey marine shale or interbedded loamy material and shale containing 0 to 25 percent selenite crystals and other salts.

Faddin Series

The Faddin series consists of very deep, moderately well drained soils that formed in loamy fluviomarine deposits derived from the Beaumont Formation of Pleistocene age. These nearly level to gently sloping soils are on ancient meander ridges. Slope is 0 to 1 percent. Soils of the Faddin series are fine, smectitic, hyperthermic Oxyaquic Vertic Argiudolls.

Typical pedon of Faddin fine sandy loam in an area of Faddin fine sandy loam, 0 to 1 percent slopes; from the intersection of Loop 175 and U. S. Highway 77 southwest of Victoria, 11.3 miles south on U.S. Highway 77 to Farm Road 445, 1.9 miles east on Farm Road 445, 1.0 mile northeast and north, 0.45 mile east, and 50 feet north in rangeland. McFaddin USGS topographic quadrangle; Latitude: 28 degrees, 34 minutes, 1 second North; Longitude: 96 degrees, 59 minutes, 59 seconds West; NAD 83.

A—0 to 41 centimeters (0 to 16 inches); very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2), dry; moderate fine and very fine subangular blocky structure; slightly hard, very friable; many fine and very fine and few medium roots; common very fine pores; slightly acid; abrupt wavy boundary.

Bt1—41 to 61 centimeters (16 to 24 inches); very dark gray (10YR 3/1) clay, gray (10YR 5/1), dry; moderate fine angular blocky structure; extremely hard, very firm; common fine and very fine and few medium roots; few very fine pores; few faint slickensides and pressure faces; few faint clay films on faces of peds; common medium and coarse prominent red (2.5YR 4/6) and few fine and medium distinct strong brown (7.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; slightly acid; abrupt wavy boundary.

Bt2—61 to 89 centimeters (24 to 35 inches); gray (10YR 5l) clay, gray (10YR 6/1), dry; moderate fine angular blocky structure; extremely hard, very firm; common very fine and fine roots; few faint slickensides and pressure faces; common faint clay films on faces of peds; common medium and coarse distinct yellowish brown (10YR 5/6) masses of oxidized iron with sharp boundaries in matrix; neutral; clear wavy boundary.

Bt3—89 to 117 centimeters (35 to 46 inches); grayish brown (10YR 5/2) sandy clay, light brownish gray (10YR 6/2), dry; moderate medium prismatic structure parting to moderate medium and coarse angular blocky; extremely hard, very firm; few fine roots; common distinct clay films along faces of prisms and patchy clay films on faces of some peds; few pitted concretions of calcium carbonate 2 to 5 millimeters in diameter; few fine black (10YR 2/1) iron-manganese nodules; slightly effervescent; moderately alkaline; gradual wavy boundary.

Btk—117 to 203 centimeters (46 to 80 inches); light brownish gray (2.5Y 6/2) clay loam, light gray (2.5Y 7/2), dry; weak medium and coarse angular blocky structure parting to weak fine and very fine subangular blocky; extremely hard, firm; few fine roots; common faint clay films on faces of some peds; about 30 percent by volume soft powdery masses of calcium carbonate 0.4 to 1 centimeter across; few pitted concretions of calcium carbonate 0.5 to 8 centimeters in diameter; few fine black (10YR 2/1) iron-manganese nodules; slightly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 2 or 3
Chroma: 1 or 2
Texture: fine sandy loam
Other features: The contact between the A and Bt horizon is abrupt and wavy causing crests and troughs. Typically, the horizon is about 41 centimeters (16 inches) thick, and ranges from 20 to 36 centimeters (8 to 14 inches) thick on subsoil crests and 36 to 51 centimeters (14 to 20 inches) thick in subsoil troughs. There is a discontinuous E horizon, 1 to 3 inches thick in subsoil troughs in some pedons.
Reaction: slightly acid or neutral

Upper Bt horizon

Hue: 10YR
Value: 3 to 7
Chroma: 1 or 2
Texture: sandy clay, clay loam, or clay
Clay content: 35 to 57 percent
Redox concentrations: amount—2 to 20 percent; shades—red, brown, or yellow
Identifiable secondary calcium carbonate: amount—0 to 3 percent; kind—concretions, masses, or threads
Reaction: slightly acid to neutral

Lower Bt horizon

Hue: 10YR
Value: 3 to 5
Chroma: 1 or 2
Texture: sandy clay, clay loam, or clay
Clay content: 35 to 57 percent
Redox concentrations: amount—0 to 10 percent; shades—red, brown, or yellow
Identifiable secondary calcium carbonate: amount—0 to 3 percent; kind—concretions, masses, or threads
Effervescence: very slight or slight
Reaction: slightly alkaline or moderately alkaline

Btk horizon

Hue: 7.5YR to 2.5Y
Value: 4 to 7
Chroma: 1 or 2
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 30 to 40 percent
Redox concentrations: amount—0 to 10 percent; shades—red, brown, or yellow
Redox depletions: amount—0 to 2; shades—gray
Identifiable secondary calcium carbonate: amount—5 to 35 percent; kind—concretions, masses, or threads
Effervescence: very slight or slight
Reaction: slightly alkaline or moderately alkaline

Goliad Series

The Goliad series consists of moderately deep, well drained soils that formed in loamy residuum weathered from sandstone of the Goliad Formation. These nearly level to gently sloping soils are on shoulders of hills. Slope ranges from 1 to 3 percent. Soils of the Goliad series are fine, smectitic, hyperthermic Petrocalcic Paleustolls.

Typical pedon of Goliad sandy clay loam in an area of Goliad sandy clay loam, 1 to 3 percent slopes; from the intersection of Texas Highway 239 and U.S. Highway 59 west of Goliad, 3.5 miles west on Texas Highway 239 to Baker Lane, 1.2 miles north, and 1,700 feet east in rangeland. Goliad USGS topographic quadrangle; Latitude: 28 degrees, 41 minutes, 28.60 seconds North; Longitude: 97 degrees, 28 minutes, 13.40 seconds West; NAD 83.

A—0 to 33 centimeters (0 to 13 inches); very dark gray (10YR 3/1) sandy clay loam, black (10YR 2/1, moist; moderate medium subangular blocky structure; friable, slightly hard; common very fine and fine roots and few medium roots; common fine and very fine tubular pores; slightly alkaline; clear smooth boundary.

Bt—33 to 43 centimeters (13 to 17 inches); brown (7.5YR 4/4) sandy clay loam, dark brown (7.5YR 3/4), moist; moderate coarse subangular blocky structure; friable, slightly hard; common fine roots and common very fine roots; common fine tubular and common very fine tubular pores; 5 percent distinct dark brown (7.5YR 3/2) clay films on all faces of peds; 1 percent fine carbonate nodules; moderately alkaline; clear smooth boundary.

Btk1—43 to 64 centimeters (17 to 25 inches); yellowish red (5YR 5/6) sandy clay, yellowish red (5YR 4/6), moist; strong coarse subangular blocky structure; firm, hard; 5 percent distinct reddish brown (5YR 5/4) clay films on all faces of peds; 2 percent fine carbonate nodules; 2 percent fine and medium carbonate masses; strongly effervescent; moderately alkaline; gradual smooth boundary.

Btk2—64 to 94 centimeters (25 to 37 inches); light brown (7.5YR 6/4) clay loam, light brown (7.5YR 6/4), moist; moderate medium subangular blocky structure; very firm, very hard; 5 percent distinct reddish brown (5YR 5/4) clay films on all faces of peds; 5 percent fine carbonate nodules; 25 percent fine and medium carbonate masses; strongly effervescent; moderately alkaline; abrupt smooth boundary.

Bkkm1—94 to 124 centimeters (37 to 49 inches); white (10YR 8/1) cemented material, white (10YR 8/1), moist; massive; very rigid, very rigid; violently effervescent; moderately alkaline; clear smooth boundary.

Bkkm2—124 to 203 centimeters (49 to 80 inches); light brown (7.5YR 6/4) loam, brown (7.5YR 5/4), moist; massive; firm, hard; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 1 to 4
Texture: fine sandy loam or sandy clay loam
Reaction: neutral to moderately alkaline

Bt1 horizon

Hue: 5YR or 7.5YR
Value: 3 to 5
Chroma: 2 to 4
Texture: sandy clay loam, sandy clay, or clay loam
Clay content: 33 to 40 percent
Reaction: neutral to moderately alkaline

Bt2 horizon (where present)

Hue: 2.5YR or 5YR
Value: 4 to 6
Chroma: 3 to 6

Texture: clay loam, sandy clay, or clay
Clay content: 37 to 50 percent
Effervescence: none to slight
Reaction: slightly alkaline or moderately alkaline

Btk or Bk horizon (where present and is 3 to 10 centimeters [1 to 4 inches] thick)

Hue: 2.5YR or 5YR
Value: 4 to 6
Chroma: 3 to 6
Texture: clay loam, sandy clay, or clay
Clay content: 37 to 50 percent
Identifiable secondary calcium carbonate: amount—1 to 15 percent; kind—masses and nodules
Effervescence: slight to violent
Reaction: slightly alkaline or moderately alkaline

Bkkm horizon
Hue: 10YR
Value: 7 or 8
Chroma: 1 or 2
Texture: weakly to strongly cemented calcium carbonate with decreasing cementation with depth
Effervescence: strong or violent

Greta Series

The Greta series consists of very deep, somewhat poorly drained soils that formed in loamy fluviomarine deposits of the Lissie Formation of early Pleistocene age. These nearly level soils are flats on the coastal plain. Slope is 0 to 1 percent. Soils of the Greta series are fine-loamy, mixed, superactive, hyperthermic Aquic Natrustalfs.

Typical pedon of Greta fine sandy loam in an area of Greta fine sandy loam, 0 to 1 percent slopes; from the intersection of U.S. Highway 183 and Texas Highway 239 south of Goliad, 8.2 miles southeast on Texas Highway 239 to gate on south side of road, 3.5 miles south on private ranch road, and 50 feet east of fence in rangeland. Live Oak Lake USGS topographic quadrangle; Latitude: 28 degrees, 33 minutes, 5.00 seconds North; Longitude: 97 degrees, 16 minutes, 58.30 seconds West; NAD 83.

A—0 to 13 centimeters (0 to 5 inches); grayish brown (10YR 5/2), fine sandy loam, brown (10YR 4/2), moist; friable, extremely hard, massive; common very fine roots; common fine, medium, and very fine vesicular pores; 5 percent fine prominent brown (7.5YR 4/3) masses of iron-manganese with diffuse boundaries lining pores at contact with the Bt horizon; 2 percent fine faint gray (10YR 6/1) iron depletions with clear boundaries in matrix adjacent to masses of iron-manganese; neutral; abrupt smooth boundary.

Btn1—13 to 33 centimeters (5 to 13 inches); dark gray (10YR 4/1), sandy clay loam, very dark gray (10YR 3/1), moist; moderate medium and coarse columnar structure parting to moderate medium and coarse angular blocky; very firm, extremely hard; common very fine roots; common very fine tubular pores; 5 percent prominent light brownish gray (10YR 6/2) sand coats on vertical faces of peds; 10 percent prominent very dark gray (10YR 3/1) clay films on faces of peds; 5 percent fine prominent brown (7.5YR 4/4) masses of iron-manganese with clear boundaries lining pores; 2 percent fine faint gray (10YR 6/1) iron depletions with clear boundaries in matrix adjacent to masses of iron-manganese; neutral; clear wavy boundary.

Btn2—33 to 63 centimeters (13 to 25 inches); dark gray (10YR 4/1), sandy clay loam, dark gray (10YR 4/1), moist; moderate extremely coarse prismatic structure parting to moderate medium and coarse angular blocky; very firm, extremely hard; few very fine roots; few very fine tubular pores; 5 percent distinct light brownish gray (10YR 6/2) sand coats on vertical faces of peds; 10 percent distinct very dark gray (10YR 3/1) clay films on faces of peds; 5 percent fine prominent black (7.5YR 2.5/1) masses of iron-manganese with clear boundaries lining pores; slightly alkaline; clear wavy boundary.

Btn3—63 to 86 centimeters (25 to 34 inches); grayish brown (10YR 5/2), sandy clay loam, dark grayish brown (10YR 4/2), moist; moderate very coarse prismatic structure parting to moderate medium and coarse angular blocky; very firm, extremely hard; few very fine roots; few very fine tubular pores; 10 percent distinct light brownish gray (10YR 6/2) sand coats on vertical faces of peds; 20 percent distinct dark gray (10YR 4/1) clay films on faces of peds; less than 1 percent fine white (5Y 8/1) masses of calcium carbonate; 5 percent fine prominent black (7.5YR 2.5/1) masses of iron-manganese with clear boundaries lining pores; 1 percent fine very dark gray (10YR 3/1) insect casts; moderately alkaline; clear wavy boundary.

Btkn1—86 to 124 centimeters (34 to 49 inches); light brownish gray (2.5Y 6/2), sandy clay loam, grayish brown (2.5Y 5/2), moist; moderate very coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm, very hard; few very fine tubular pores; 10 percent faint grayish brown (2.5Y 5/2) clay films on faces of peds; 3 percent fine and medium distinct white (5Y 8/1) nodules of calcium carbonate; 25 percent fine to coarse distinct white (5Y 8/1) masses of calcium carbonate; 5 percent fine prominent black (7.5YR 2.5/1) masses of iron-manganese with clear boundaries lining pores; 1 percent fine prominent very dark gray (10YR 3/1) insect casts; matrix is noneffervescent; moderately alkaline; gradual smooth boundary.

Btkn2—124 to 168 centimeters (49 to 66 inches); light gray (2.5Y 7/2), sandy clay loam, light brownish gray (2.5Y 6/2), moist; moderate very coarse prismatic structure parting to moderate coarse subangular blocky; firm, very hard; 20 percent distinct grayish brown (2.5Y 5/2) clay films on vertical faces of peds; 3 percent fine and medium distinct white (5Y 8/1) nodules of calcium carbonate; 30 percent fine to coarse distinct white (5Y 8/1) masses of calcium carbonate; 5 percent fine prominent black (7.5YR 2.5/1) masses of iron-manganese with sharp boundaries lining pores; 1 percent fine prominent very dark gray (10YR 3/1) insect casts; matrix is noneffervescent; moderately alkaline; gradual smooth boundary.

Btkn3—168 to 203 centimeters (66 to 80 inches); light gray (2.5Y 7/2), sandy clay loam, light brownish gray (2.5Y 6/2), moist; weak very coarse subangular blocky structure; firm, very hard; 15 percent faint grayish brown (10YR 5/2) clay films on vertical faces of peds; 4 percent fine and medium distinct white (5Y 8/1) nodules of calcium carbonate located inside carbonate masses; 30 percent medium and coarse distinct white (5Y 8/1) masses of calcium carbonate; 1 percent fine prominent yellowish brown (10YR 5/4) masses of iron with clear boundaries in matrix; 1 percent fine prominent black (7.5YR 2.5/1) concretions of iron-manganese in matrix; 3 percent fine prominent very dark brown (7.5YR 2/2) masses of iron-manganese with sharp boundaries in matrix; 1 percent fine prominent very dark gray (10YR 3/1) insect casts; matrix is noneffervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 1 to 3

Texture: fine sandy loam
Clay content: 8 to 18 percent
Redox concentrations: amount—0 to 4 percent; size—fine; shades—brown or yellow
Iron depletions: amount—2 to 4 percent; size—fine; shades—gray
EC (dS/m): 0.3 to 2
SAR: 2 to 4
Reaction: slightly acid or neutral

Upper Btn horizon

Hue: 7.5YR or 10YR
Value: 3 or 4
Chroma: 1 to 3
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 22 to 40 percent
Redox concentrations: amount—0 to 4; size—fine; shades—brown or yellow
Iron depletions: amount—2 to 4 percent; size—fine; shades—gray
EC (dS/m): 0.5 to 4
SAR: 6 to 20
Reaction: neutral or slightly alkaline

Lower Btn horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 1 to 3
Texture: sandy clay loam or clay loam
Clay content: 22 to 35 percent
Redox concentrations: amount—0 to 4; size—fine; shades—brown or yellow
Iron depletions: amount—2 to 4 percent; size—fine; shades—gray
EC (dS/m): 0.5 to 4
SAR: 6 to 20
Reaction: neutral or slightly alkaline

Btkn horizon (some pedons have a Bk horizon with similar colors and textures)

Hue: 10YR or 2.5Y
Value: 4 to 7
Chroma: 2 or 3
Texture: sandy clay loam or clay loam
Clay content: 22 to 35 percent
Redox concentrations: amount—0 to 4 percent; size—fine; shades—brown or yellow
Calcium carbonate equivalent: 5 to 25 percent
Identifiable secondary calcium carbonate: amount—10 to 35 percent; size—fine to coarse
EC (dS/m): 2 to 6
SAR: 13 to 20
Effervesence: none to very slight
Reaction: slightly alkaline or moderately alkaline

Imogene Series

The Imogene series consists of very deep, moderately well drained soils that formed in saline, calcareous, loamy sediments of Pleistocene or Recent age. These nearly level or very gently sloping soils are on low stream terraces. Slope is 0 to 1 percent. Soils of the Imogene series are fine-loamy, mixed, superactive, hyperthermic Mollic Natrustalfs.

Typical pedon of Imogene fine sandy loam in an area of Imogene fine sandy loam, 0 to 1 percent slopes; from the intersection of Farm Road 884 and Texas Highway 119 in

Weesatche, 0.25 mile north to Dornburg Road, 1.1 miles north on Dornburg Road to private road, 0.2 mile east on private road in rangeland. Weesatche USGS topographic quadrangle; Latitude: 28 degrees, 52 minutes, 1.99 seconds North; Longitude: 97 degrees, 26 minutes, 37.94 seconds West; NAD 83.

A—0 to 16 centimeters (0 to 6 inches); gray (10YR 5/1) fine sandy loam, very dark grayish brown (10YR 3/2), moist; moderate medium subangular blocky structure; hard, firm; common very fine roots; common very fine interstitial pores; neutral; clear smooth boundary.

Btn1—16 to 63 centimeters (6 to 25 inches); very dark gray (10YR 3/1) clay loam, very dark gray (10YR 3/1), moist; weak medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm; common very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

Btn2—63 to 112 centimeters (25 to 44 inches); grayish brown (2.5Y 5/2) sandy clay loam, dark grayish brown (2.5Y 4/2), moist; weak medium prismatic structure parting to moderate medium subangular blocky; very hard, firm; common very fine tubular pores; 2 percent black (10YR 2/1), moist, organic stains on all faces of peds; 1 percent fine masses of oxidized iron and 2 percent fine black (10YR 2/1), moist, iron-manganese masses with sharp boundaries in matrix; 1 percent fine carbonate masses and 1 percent fine salt masses; neutral; clear smooth boundary.

Btn3—112 to 165 centimeters (44 to 65 inches); grayish brown (2.5Y 5/2) sandy clay loam, grayish brown (2.5Y 5/2), moist; weak medium subangular blocky structure; hard, firm; common very fine tubular pores; slightly alkaline; clear smooth boundary.

Btkn—165 to 203 centimeters (65 to 80 inches); pale yellow (2.5Y 8/3) loam, pale yellow (2.5Y 7/3), moist; weak medium subangular blocky structure; hard, firm; 5 percent carbonate nodules and 15 percent carbonate masses; moderately alkaline.

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 1 to 4
Texture: fine sandy loam
Clay content: 8 to 18 percent
EC (dS/m): 0 to 2
SAR: 2 to 6
Reaction: slightly acid to slightly alkaline

Btn horizon

Hue: 7.5YR to 2.5Y
Value: 3 to 5
Chroma: 1 to 4
Texture: sandy clay loam or clay loam
Clay content: 20 to 35 percent
EC (dS/m): 2 to 6
SAR: 13 to 40
Reaction: neutral to moderately alkaline

Btkn horizon

Hue: 10YR or 2.5Y
Value: 5 to 8
Chroma: 2 to 4
Texture: loam, sandy clay loam, or clay loam
Clay content: 20 to 40 percent
Calcium carbonate equivalent: 0 to 30 percent

*Identifiable secondary calcium carbonate: amount—*few *to many; kind—masses, threads, or nodules*
EC (dS/m): 2 to 20
SAR: 25 to more than 40
Effervescence: very slight to strong
Reaction: neutral to strongly alkaline

Bnz or Btnz horizon (where present)

Hue: 10YR or 2.5Y
Value: 4 to 7
Chroma: 1 to 3
Texture: sandy clay loam or clay loam
Clay content: 20 to 35 percent
Calcium carbonate equivalent: 0 to 5 percent
Identifiable secondary calcium carbonate: amount—none to few; kind—masses, threads, or nodules
EC (dS/m): 2 to 8
SAR: 20 to 40
Effervescence: none to slight
Reaction: neutral to strongly alkaline

Inari Series

The Inari series consists of very deep, moderately well drained soils that formed in loamy fluviomarine deposits of Early Pleistocene age. These nearly level or very gently sloping soils are on rises on flat coastal plains. Slope ranges from 0 to 3 percent. Soils of the Inari series are fine-loamy, mixed, superactive, hyperthermic Oxyaquic Argiustolls.

Typical pedon of Inari fine sandy loam (fig. 32) in an area of Inari fine sandy loam, 0 to 1 percent slopes; from the Refugio and Goliad County line marker on Texas Highway 239, 1.0 mile west on Texas Highway 239 to gate on south side of road, 7.0 miles south and southwest on ranch road to double windmills, 0.9 mile northwest and west on ranch road, 0.2 mile northwest in rangeland. Lott Lake USGS topographic quadrangle; Latitude: 28 degrees, 30 minutes, 18.10 seconds North; Longitude: 97 degrees, 13 minutes, 25.20 seconds West; NAD 83.

A—0 to 28 centimeters (0 to 11 inches); dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2), moist; moderate medium and coarse granular structure; very friable, soft, slightly sticky, slightly plastic; many very fine roots; slightly acid; abrupt wavy boundary.

Bt1—28 to 46 centimeters (11 to 18 inches); dark grayish brown (10YR 4/2) sandy clay, dark grayish brown (10YR 4/2), moist; moderate medium prismatic structure parting to moderate medium angular blocky structure; firm, very hard, very sticky, very plastic; common very fine roots; common fine tubular pores; 1 percent faint dark grayish brown (10YR 4/2) organic stains on vertical faces of peds; 10 percent faint pressure faces on vertical faces of peds; 20 percent faint distinct grayish brown (10YR 5/2) clay films on faces of peds; 3 percent fine prominent red (2.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 5 percent fine and medium prominent yellowish red (5YR 4/6) masses of oxidized iron with sharp boundaries in matrix, 5 percent fine and medium distinct yellow (10YR 7/8) masses of oxidized iron with clear boundaries in matrix; slightly acid; clear wavy boundary.

Bt2—46 to 66 centimeters (18 to 26 inches); gray (10YR 6/1) sandy clay loam, gray (10YR 5/1), moist; strong medium prismatic structure parting to strong medium angular blocky structure; firm, very hard, very sticky, very plastic; common very fine roots; common very fine tubular pores; 3 percent distinct dark gray (10YR 4/1)

Figure 32.—Profile of Inari fine sandy loam, 1 to 3 percent slopes. Inari soils have dark surfaces or mollic epipedons, and occur as ridges in the Gulf Coast Prairies. (Scale in inches.)

organic stains on vertical faces of peds; 15 percent distinct pressure faces on vertical faces of peds; 20 percent faint gray (10YR 5/1) clay films on all faces of peds; 1 percent fine and medium prominent red (2.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 4 percent medium prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 8 percent fine and medium distinct brownish yellow (10YR 6/8) masses of oxidized iron with clear boundaries in matrix; neutral; clear wavy boundary.

Bt3—66 to 91 centimeters (26 to 36 inches); gray (10YR 6/1) sandy clay loam, gray (10YR 5/1), moist; moderate medium and coarse prismatic structure parting to moderate medium angular blocky structure; firm, very hard, moderately sticky, moderately plastic; common very fine roots; common very fine tubular pores; 10 percent distinct dark gray (10YR 4/1) organic stains on vertical faces of peds; 15 percent prominent pressure faces on vertical faces of peds; 15 percent faint gray (10YR 6/1) clay films on all faces of peds; 1 percent fine distinct black (10YR 2/1) manganese masses with sharp boundaries in matrix; 2 percent medium prominent red (2.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 3 percent medium and coarse prominent brown (7.5YR 4/4) masses of oxidized iron with sharp boundaries in matrix; 5 percent fine and medium prominent yellow (10YR 7/8) masses of oxidized iron with clear boundaries in matrix; neutral; clear wavy boundary.

Btk1—91 to 132 centimeters (36 to 52 inches); light brownish gray (10YR 6/2) sandy clay loam, light brownish gray (10YR 6/2), moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse angular blocky; firm, hard, moderately sticky, moderately plastic; common very fine roots; common very fine tubular pores; 1 percent distinct dark grayish brown (10YR 4/2) organic stains on vertical faces of peds; 5 percent distinct pressure faces on vertical faces of peds; 10 percent distinct sand coats on all faces of peds; 20 percent faint gray (10YR 6/1) clay films on vertical faces of peds; 3 percent by volume coarse masses of calcium carbonate; 1 percent by volume fine and medium nodules of calcium carbonate embedded in masses of calcium carbonate; 1 percent fine distinct black (10YR 2/1) masses of manganese with sharp boundaries in matrix; 1 percent fine faint light yellowish brown (10YR 6/4) masses of oxidized iron with clear boundaries in matrix; 3 percent fine distinct dark yellowish brown (10YR 4/4) masses of oxidized iron with clear boundaries on vertical faces of peds; moderately alkaline; clear wavy boundary.

Btk2—132 to 183 centimeters (52 to 72 inches); pale yellow (2.5Y 7/3) sandy clay loam, pale yellow (2.5Y 7/3), moist; moderate coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm, hard, moderately sticky, slightly plastic; common very fine roots; common very fine tubular pores; 1 percent distinct pressure faces on vertical faces of peds; 3 percent faint sand coats on vertical faces of peds; 10 percent faint distinct light gray (2.5Y 7/2) clay films on all faces of peds; 5 percent by volume medium and coarse masses of calcium carbonate; 1 percent by volume medium nodules of calcium carbonate embedded in carbonate masses; 1 percent fine prominent black (10YR 2/1) manganese masses with sharp boundaries in matrix; moderately alkaline; gradual wavy boundary.

Btk3—183 to 203 (72 to 80 inches); light gray (2.5Y 7/2) sandy clay loam, light gray (2.5Y 7/2), moist; weak coarse prismatic structure parting to moderate coarse subangular blocky; firm, hard, moderately sticky, moderately plastic; common very fine roots; 1 percent distinct sand coats on vertical faces of peds; 5 percent faint pressure faces on vertical faces of peds; 20 percent faint distinct light brownish gray (2.5Y 6/2) clay films on all faces of peds; 6 percent by volume coarse carbonate masses; 1 percent by volume medium carbonate nodules embedded in carbonate masses; 1 percent fine distinct black (10YR 2/1) masses of manganese with sharp boundaries in matrix; 1 percent fine prominent yellowish brown (10YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 1 percent fine distinct yellow (2.5Y 7/6) masses of oxidized iron with clear boundaries in matrix; moderately alkaline.

A horizon

Hue: 10YR
Value: 2 to 4
Chroma: 1 or 2
Texture: fine sandy loam
Clay content: 5 to 15 percent
Redox concentrations: amount—0 to 2 percent; size—fine or medium; contrast—faint or distinct; boundary—clear; location—lining pores; shades—brown
Reaction: moderately acid or slightly acid

Upper Bt horizon

Hue: 7.5YR or 10YR
Value: 2.5 to 6
Chroma: 1 or 2
Texture: sandy clay loam, sandy clay, or clay

Clay content: 30 to 45 percent
Clay films: location—on vertical faces of peds; contrast—faint or distinct
Redox concentrations: amount—0 to 10 percent; size—fine or medium; contrast—distinct or prominent; boundary—clear or sharp; location—in matrix; shades—red, brown, or yellow
Iron-manganese masses: amount—1 to 4 percent; size—fine or medium; shades—black
Reaction: moderately acid or slightly acid

Lower Bt horizon

Hue: 7.5YR or 10YR
Value: 4 to 7
Chroma: 1 to 4
Texture: sandy clay loam or clay loam
Clay content: 25 to 35 percent
Clay films: location—on vertical faces of peds; contrast—faint or distinct
Redox concentrations: amount—1 to 20 percent; size—fine to coarse; contrast—faint to prominent; boundary—clear or sharp; location—in matrix; shades—red, brown, or yellow
Iron-manganese masses: amount—1 to 10 percent; size—fine; shades—black
Reaction: neutral or slightly alkaline

Btk horizon

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 to 4
Texture: sandy clay loam or clay loam
Clay content: 20 to 30 percent
Clay films: location—on vertical faces of peds; contrast—faint or distinct
Redox concentrations: amount—1 to 5 percent; size—fine or medium; contrast—distinct or prominent; boundary—clear or sharp; location—in matrix; shades—red, brown, or yellow
Calcium carbonate equivalent: 1 to 5 percent
Visible calcium carbonate: amount—1 to 10 percent; size—fine or medium; location—in matrix; kind—masses, concretions, or nodules
Iron-manganese masses: amount—1 to 2 percent; size—fine; shades—black
Effervescence: none to slight
Reaction: slightly alkaline or moderately alkaline

Kuy Series

The Kuy series consists of very deep, moderately well drained soils that formed in sandy and loamy alluvial sediments of Pleistocene age. These nearly level to gently sloping soils are on stream terraces. Slope ranges from 1 to 3 percent. Soils of the Kuy series are loamy, siliceous, active, hyperthermic Grossarenic Paleudalfs.

Typical pedon of Kuy fine sand in an area of Kuy fine sand, 1 to 3 percent slopes; from the intersection of U.S. Highway 59 and Farm Road 2506 in Fannin, 2.8 miles south on Farm Road 2506 to Swickheimer Road, 1.1 miles south on Swickheimer Road to homestead, 1.5 miles south on ranch road, and 50 feet south in rangeland. Lott Lake USGS topographic quadrangle; Latitude: 28 degrees, 37 minutes, 11.90 seconds North; Longitude: 97 degrees, 14 minutes, 8.50 seconds West; NAD 83.

A—0 to 30 centimeters (0 to 12 inches); brown (10YR 4/3) fine sand, brown (10YR 5/3), dry; single grain; loose, loose, nonsticky, nonplastic; common fine roots throughout and common very fine roots; moderately acid; clear smooth boundary.

E1—30 to 76 centimeters (12 to 30 inches); yellowish brown (10YR 5/4) fine sand, light yellowish brown (10YR 6/4), dry; weak fine granular structure; loose, loose, nonsticky, nonplastic; common very fine roots; neutral; gradual smooth boundary.

E2—76 to 122 centimeters (30 to 48 inches); brown (10YR 5/3) fine sand, pale brown (10YR 6/3), dry; single grain; loose, loose, nonsticky, nonplastic; common very fine roots; neutral, gradual smooth boundary.

E3—122 to 167 centimeters (48 to 66 inches); yellowish brown (10YR 5/4) fine sand, light yellowish brown (10YR 6/4), dry; single grain; loose, loose, nonsticky, nonplastic; common very fine roots; neutral; clear smooth boundary.

Bt1—167 to 193 centimeters (66 to 76 inches); light brownish gray (10YR 6/2), sandy clay loam, percent light (10YR 7/2), dry; moderate medium and coarse subangular blocky structure; firm, slightly hard, moderately sticky, moderately plastic; 15 percent faint clay films on vertical faces of peds; 30 percent coarse prominent red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; 20 percent medium distinct yellowish brown (10YR 5/6) masses of oxidized iron with sharp boundaries in matrix; slightly acid; gradual smooth boundary.

Bt2—193 to 203 centimeters (76 to 80 inches); light brownish gray (10YR 6/2) fine sandy loam, light gray (10YR 7/2), dry; weak fine and medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; 5 percent faint clay films on vertical faces of peds; 30 percent coarse prominent reddish yellow (5YR 6/6) masses of oxidized iron with sharp boundaries in matrix; 20 percent medium and coarse prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix; moderately acid.

A horizon

Hue: 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: fine sand
Reaction: moderately acid to neutral

E horizon

Hue: 10YR
Value: 5 to 8
Chroma: 2 to 4
Texture: fine sand
Redox concentrations: amount—0 to 2 percent; shades—brown or yellow
Reaction: moderately acid to neutral

Bt horizon

Hue: 7.5YR or 10YR
Value: 5 to 7
Chroma: 1 to 8
Texture: sandy loam, sandy clay loam, or clay loam
Clay content: 18 to 35 percent
Redox concentrations: amount—10 to 50 percent; shades—red, brown, or yellow
Redox depletions: amount—0 to 10 percent; shades—gray
Reaction: strongly acid to slightly acid

Laewest Series

The Laewest series consists of very deep, moderately well drained soils that formed in clayey flood basin deposits on alluvial plains or deltas of the Beaumont Formation of Pleistocene Age. These nearly level to gently sloping soils are on broad flat coastal plains. Slope ranges from 0 to 8 percent. Soils of the Laewest series are fine, smectitic, hyperthermic Typic Hapluderts.

Typical pedon of Laewest clay (fig. 33) in a microlow in an area of Laewest clay, 0 to 1 percent slopes; from the intersection of U.S. Highway 59 and Farm Road 2506 in Fannin, 1.5 miles east on U.S. Highway 59 to private road, 1.3 miles south on private road across railroad tracks to gate, 1.1 miles east on ranch road to gate, 0.85 mile south on ranch road to gate, 0.4 mile east on ranch road to pipeline right-of-way, 100 feet north on right-of-way, and 40 feet west in rangeland. Fannin USGS topographic quadrangle; Latitude: 28 degrees, 40 minutes, 5.00 seconds North; Longitude: 97 degrees, 11 minutes, 56.00 seconds West; NAD 83.

A—0 to 15 centimeters (0 to 6 inches); black (2.5Y 2.5/1) clay, very dark gray (2.5Y 3/1), dry; moderate medium and coarse angular blocky structure; extremely firm, extremely hard; common fine roots and many very fine roots; common fine and very fine tubular; 1 percent distinct grayish brown (10YR 5/2) sand coats on vertical faces of peds; neutral; gradual wavy boundary.

Bss1—15 to 46 centimeters (6 to 18 inches); black (2.5Y 2.5/1) clay, very dark gray (2.5Y 3/1), dry; strong medium and coarse wedge-shaped structure parting to strong medium and coarse angular blocky; extremely firm, extremely hard; common fine roots and many very fine roots; 1 percent distinct grayish brown (10YR 5/2) sand coats on vertical faces of peds; 5 percent distinct slickensides (pedogenic); 15 percent distinct pressure faces; neutral; diffuse wavy boundary.

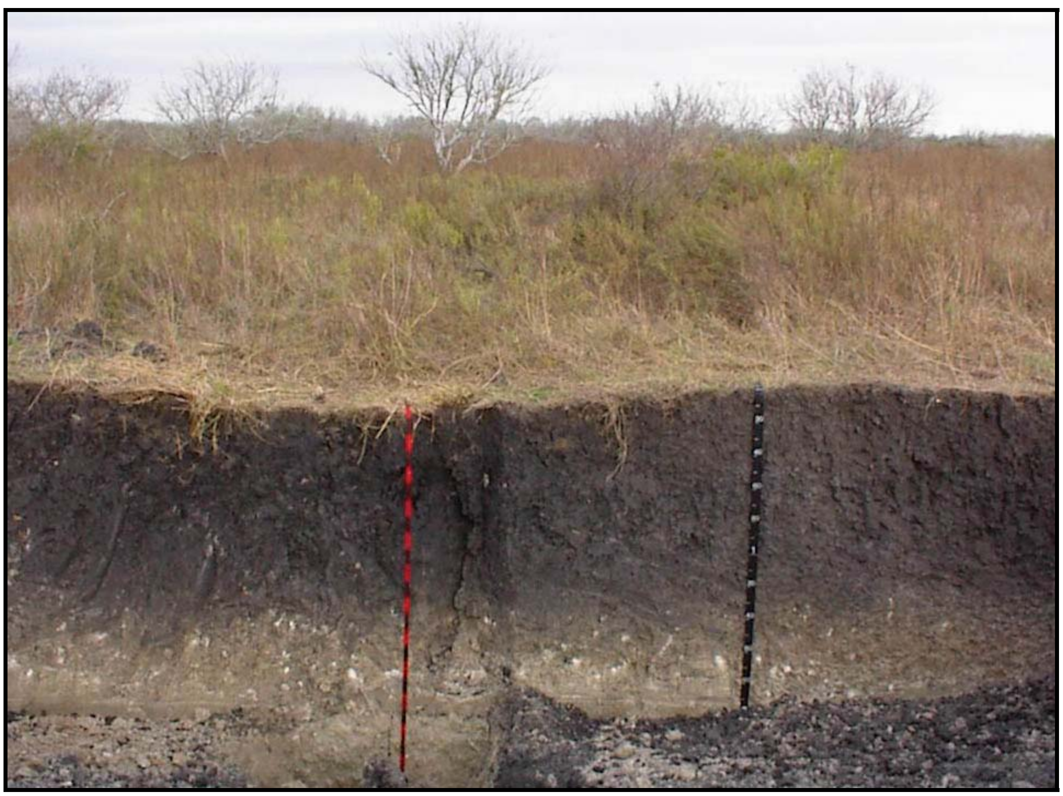

Figure 33.—Profile of the Laewest clay, 0 to 1 percent slopes. These clayey soils have a cyclic pattern of microhighs as depicted next to the black tape and microlows as depicted with the red and black tape.

Bss2—46 to 74 centimeters (18 to 29 inches); black (2.5Y 2.5/1) clay, very dark gray (2.5Y 3/1), dry; moderate medium and coarse wedge-shaped structure parting to strong medium and coarse angular blocky; extremely firm, extremely hard; common fine roots and very fine roots; 1 percent distinct grayish brown (10YR 5/2) sand coats on vertical faces of peds; 7 percent prominent slickensides (pedogenic); 10 percent distinct pressure faces; 1 percent fine spherical carbonate concretions; neutral; diffuse wavy boundary.

Bss3—74 to 101 centimeters (29 to 40 inches); black (10YR 2/1) clay, very dark gray (10YR 3/1), dry; moderate medium and coarse wedge-shaped structure parting to strong medium and coarse angular blocky; extremely firm, extremely hard; common very fine roots; 1 percent distinct grayish brown (10YR 5/2) sand coats on vertical faces of peds; 25 percent prominent slickensides (pedogenic); 10 percent distinct pressure faces; 1 percent fine carbonate masses; 2 percent fine and medium irregular carbonate concretions; noneffervescent; clear wavy boundary.

Bkss1—101 to 132 centimeters (40 to 52 inches); dark gray (10YR 4/1) clay, gray (10YR 5/1), dry; moderate medium wedge-shaped structure parting to moderate medium angular blocky; very firm, very hard; common very fine roots; 25 percent prominent slickensides (pedogenic; 5 percent distinct pressure faces; 5 percent distinct very dark gray (10YR 3/1) organic stains on vertical faces of peds; 1 percent fine spherical carbonate concretions; 3 percent fine and medium carbonate masses; very slightly effervescent; slightly alkaline; clear smooth boundary.

Bkss2—132 to 157 centimeters (52 to 62 inches); light brownish gray (2.5Y 6/2) clay, light gray (2.5Y 7/2), dry; moderate medium wedge-shaped structure parting to moderate medium angular blocky structure; very firm, very hard; 15 percent prominent slickensides (pedogenic; 5 percent pressure faces; 2 percent distinct dark gray (10YR 4/1) organic stains on vertical faces of peds; 1 percent fine distinct yellowish brown (10YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 5 percent fine distinct brownish yellow (10YR 6/6) masses of oxidized iron with clear boundaries in matrix; 30 percent medium distinct light olive brown (2.5Y 5/4) masses of oxidized iron with clear boundaries on faces of slickensides; 1 percent fine prominent very dark brown (10YR 2/2) manganese masses with sharp boundaries in matrix; 1 percent fine spherical carbonate concretions; 2 percent fine gypsum crystals; slightly effervescent; moderately alkaline; clear smooth boundary.

BCk—157 to 203 centimeters (62 to 80 inches); yellowish brown (10YR 5/4) clay loam, light yellowish brown (10YR 6/4),dry; moderate fine and medium angular blocky structure; very firm, very hard; 1 percent distinct grayish brown (10YR 5/2) sand coats on vertical faces of peds; 1 percent fine distinct very dark brown (10YR 2/2) manganese nodules with sharp boundaries in matrix; 1 percent fine distinct masses of oxidized iron with sharp boundaries in matrix; 5 percent fine and medium distinct light gray (2.5Y 7/1) iron depletions with clear boundaries in matrix; 1 percent fine spherical carbonate concretions; 1 percent fine carbonate masses; slightly effervescent; moderately alkaline

A horizon (microlow)

Hue: 10YR, 2.5Y or 5Y
Value: 2 to 3
Chroma: 1
Texture: clay
Redox concentrations: amount—0 to 5 percent; shades—brown or yellow
Iron-manganese concentrations: amount—0 to 1 percent; size—up to 3 millimeters; kind—concretions
Reaction: slightly acid or neutral

A horizon (microhigh)

Hue: 10YR, 2.5Y or 5Y
Value: 3 to 5
Chroma: 1 to 3
Texture: clay but silty clay is allowed for moderately alkaline overwash phases.
Identifiable secondary calcium carbonate: amount—0 to 2; size—2 millimeters to 1 centimeters; kind—nodules or masses
Effervescence: none to slight
Reaction: slightly acid to slightly alkaline

Bss horizon (microlow)

Hue: 10YR to 5Y
Value: 2 to 3
Chroma: 1
Identifiable secondary calcium carbonate: amount—0 to 2; size—2 millimeters to 1 centimeters; kind—nodules or masses
Redox concentrations: amount—0 to 5 percent; shades—brown or yellow
Iron-manganese concentrations: amount—0 to 1 percent; size—up to 3 millimeters; kind—concretions
Reaction: slightly acid to slightly alkaline

Bss horizon (microhigh)

Hue: 10YR, 2.5Y or 5Y
Value: 4 to 6
Chroma: 1 to 4
Identifiable secondary calcium carbonate: amount—0 to 5; size—2 millimeters to 1 centimeters; kind—nodules or masses
Reaction: slightly acid to slightly alkaline

Bkss horizon microlow and microhigh

Hue: 10YR to 5Y
Value: 4 to 6
Chroma: 1 or 2
Other features: Spots of very dark gray or black soil materials from horizons above range from none to few.
Redox concentrations: amount—1 to 5 percent; shades—brown or yellow
Redox depletions: amount—0 to 2 percent; shades—gray
Iron-manganese concentrations: amount—0 to 1 percent; size—up to 3 millimeters; kind—concretions
Identifiable secondary calcium carbonate: amount—2 to 10 percent; size—2 millimeters to 3 centimeters; kind—concretions, threads, or masses
Effervescence: very slight to strong
Reaction: slightly alkaline or moderately alkaline

BCk horizon microlow and microhigh (where present)

Hue: 10YR, 2.5Y, or 5Y
Value: 4 to 7
Chroma: 2 to 6
Texture: clay loam
Redox concentrations: amount—2 to 20 percent; shades—brown or yellow
Redox depletions: amount—0 to 2 percent; shades—gray
Iron-manganese concentrations: amount—0 to 1 percent; size—up to 3 millimeters; kind—concretions

Identifiable secondary calcium carbonate: amount—2 to 10 percent; size—2 millimeters to 3 centimeters; kind—concretions, threads, or masses
Effervescence: very slight to strong

Leming Series

The Leming series consists of very deep, moderately well drained soils that formed in loamy alluvium of Pleistocene age. These nearly level to gently sloping soils are on high stream terraces. Slope ranges from 0 to 5 percent. Soils of the Leming series are clayey, mixed, active, hyperthermic Arenic Paleustalfs.

Typical pedon of Leming loamy fine sand in an area of Leming loamy fine sand, 0 to 3 percent slopes; from the intersection of Farm Road 884 and Farm Road 81 in the western part of the county, 0.8 mile east on Farm Road 884 to private road, 0.4 mile south on private road, and 100 feet east in pastureland. Runge SE USGS topographic quadrangle; Latitude: 28 degrees, 46 minutes, 5.10 seconds North; Longitude: 97 degrees, 36 minutes, 23.20 seconds West; NAD 83.

A—0 to 20 centimeters (0 to 8 inches); brown (10YR 5/3) loamy fine sand, brown (10YR 4/3), moist; single grain; loose, loose; common very fine and fine roots; slightly acid; gradual smooth boundary.

E—20 to 71 centimeters (8 to 28 inches); pale brown (10YR 6/3) loamy fine sand, brown (10YR 5/3), moist; single grain; loose, loose; common very fine roots; slightly acid; abrupt smooth boundary.

Bt1—71 to 86 centimeters (28 to 34 inches); light brownish gray (10YR 6/2) clay, grayish brown (10YR 5/2), moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, firm; common very fine pores; 10 percent distinct very dark grayish brown (10YR 3/2) clay films on all faces of peds; 12 percent fine and medium prominent strong brown (7.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 8 percent medium and coarse prominent yellowish red (5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; slightly acid; clear smooth boundary.

Bt2—86 to 104 centimeters (34 to 41 inches); light gray (10YR 7/2) clay, light brownish gray (10YR 6/2), moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, firm; common very fine pores; 8 percent distinct very dark grayish brown (10YR 3/2) clay films on all faces of peds; 15 percent medium and coarse prominent strong brown (7.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 20 percent coarse prominent yellowish red (5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; slightly acid; clear smooth boundary.

Bt3—104 to 122 centimeters (41 to 48 inches); very pale brown (10YR 7/3) clay loam, brown (10YR 5/3), moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine pores; 8 percent distinct dark grayish brown (10YR 4/2) clay films on all faces of peds; 20 percent coarse red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; 10 percent medium and coarse brown (7.5YR 5/3) masses of oxidized iron with clear boundaries in matrix; neutral; clear smooth boundary.

Bt4—122 to 137 centimeters (48 to 54 inches); very pale brown (10YR 7/3) sandy clay loam, brown (10YR 5/3), moist; weak medium subangular blocky structure; hard, firm; common very fine pores; 8 percent distinct dark grayish brown (10YR 4/2) clay films on all faces of peds; 30 percent coarse red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; slightly alkaline; clear smooth boundary.

Bt5—137 to 203 centimeters; very pale brown (10YR 7/3) sandy clay loam, pale brown (10YR 6/3), moist; weak medium subangular blocky structure; slightly hard, friable; common very fine pores; 10 percent distinct grayish brown (10YR 5/2) clay films on all faces of peds; 30 percent coarse prominent yellowish red (5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; slightly alkaline.

A horizon

Hue: 10YR
Value: 4 to 6
Chroma: 2 or 3
Texture: loamy fine sand
Reaction: slightly acid or neutral

E horizon

Hue: 10YR
Value: 6 to 8
Chroma: 2 to 4
Texture: fine sand or loamy fine sand
Reaction: slightly acid or neutral

Upper Bt horizon

Hue: 10YR
Value: 5 to 8
Chroma: 2 to 4
Texture: sandy clay or clay
Redox concentrations: amount—5 to 30 percent; shades—red, brown, or yellow
Redox depletions: amount—0 to 5 percent; shades—gray
Reaction: slightly acid to neutral

Lower Bt horizon

Hue: 10YR
Value: 5 to 8
Chroma: 2 to 4
Texture: clay loam or sandy clay loam
Redox concentrations: amount—15 to 50 percent; shades—red, brown, or yellow
Redox depletions: amount—0 to 10 percent; shades—gray
Identifiable secondary calcium carbonate: amount—none to common; kind—masses and concretions
Reaction: slightly acid to moderately alkaline

Meguin Series

The Meguin series consists of deep, well drained soils that formed in calcareous loamy alluvium of Quaternary age. These soils are in flood plains of large streams in South Texas. Slope is 0 to 1 percent. Soils of the Meguin series are fine-silty, mixed, superactive, hyperthermic Fluventic Haplustolls.

Typical pedon of Meguin silty clay loam (fig. 34) in an area of Meguin silty clay loam, 0 to 1 percent slopes, occasionally flooded; from the intersection of Farm Road 1351 and Riverdale Road, 0.7 mile west on Farm Road 1351 to private ranch road, 0.8 mile north on private ranch road, and 200 feet east in range. Charco USGS topographic quadrangle; Latitude: 28 degrees, 39 minutes, 45.50 seconds North; Longitude: 97 degrees, 33 minutes, 8.00 seconds West; NAD 83.

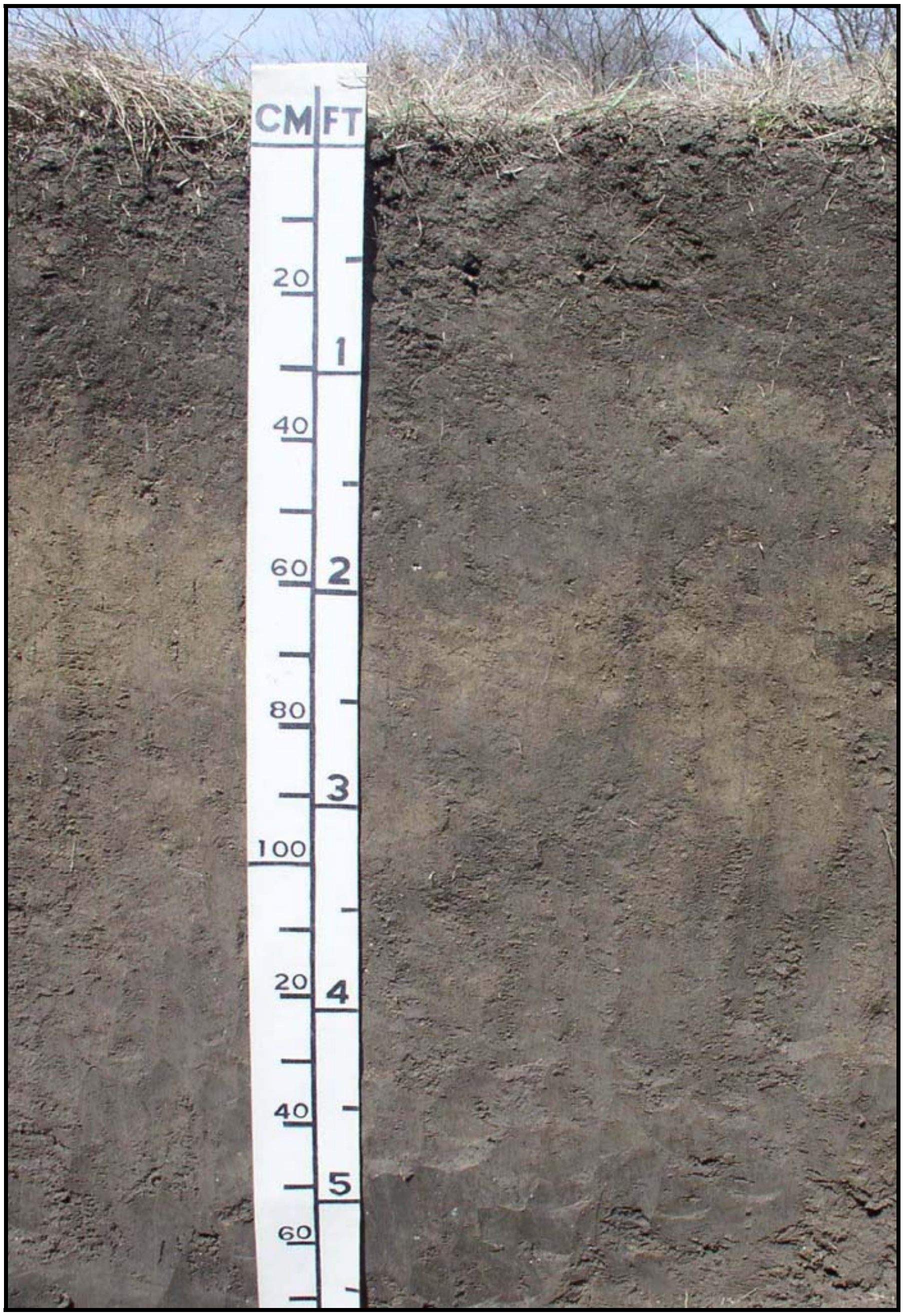

Figure 34.—Profile of Meguin silty clay loam, 0 to 1 percent slopes, occasionally flooded. A buried A horizon occurs at a depth 147 centimeters (58 inches). Meguin soils formed from previous flooding events. (Scale in centimeters and feet.)

A1—0 to 14 centimeters (0 to 6 inches); dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1), moist; weak fine and medium subangular blocky structure and weak medium granular structure; slightly hard, friable; common fine roots and many very fine roots; common fine tubular and many fine and medium interstitial pores; strongly effervescent; neutral; clear smooth boundary.

A2—14 to 45 centimeters (6 to 18 inches); dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1), moist; moderate medium subangular blocky structure; slightly hard, friable; many very fine roots; common fine tubular and many very fine tubular pores; 1 percent shell fragments; strongly effervescent; neutral; gradual smooth boundary.Bw1—45 to 74 centimeters (18 to 29 inches) light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4), moist; weak medium and coarse subangular blocky structure; slightly hard, very friable; common fine roots and many very fine roots; many very fine tubular pores; 1 percent fine distinct yellowish brown (10YR 5/6) masses of oxidized iron with sharp boundaries lining pores; 1 percent shell fragments; violently effervescent; moderately alkaline; clear smooth boundary.Bw2—74 to 104 centimeters (29 to 41 inches); pale brown (10YR 6/3) loam, brown (10YR 5/3), moist; moderate medium and coarse subangular blocky structure; slightly hard, friable; many very fine roots; common fine tubular and many very fine tubular pores; 1 percent fine faint dark yellowish brown (10YR 4/4) masses of oxidized iron with clear boundaries in matrix; 1 percent shell fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

Bw3—104 to 126 centimeters (41 to 50 inches); light brownish gray (10YR 6/2) clay loam, grayish brown (10YR 5/2), moist; weak medium subangular blocky structure; slightly hard, friable; common very fine roots; common very fine tubular pores; 2 percent fine and medium distinct dark yellowish brown (10YR 4/6) masses of oxidized iron with clear boundaries in matrix; 1 percent shell fragments; violently effervescent; moderately alkaline; gradual wavy boundary.

Bw4—126 to 155 centimeters (50 to 61 inches); light gray (10YR 7/2) clay loam, grayish brown (10YR 5/2), moist; moderate medium and coarse subangular blocky structure; hard, firm; common very fine roots; common very fine tubular pores; 1 percent fine distinct dark yellowish brown (10YR 3/4) masses of oxidized iron with sharp boundaries lining pores and 1 percent fine black (10YR 2/1) iron-manganese masses with sharp boundaries in matrix surrounding redox concentrations; strongly effervescent; slightly alkaline; clear wavy boundary. Bssb—155 to 203 centimeters (61 to 80 inches); gray (10YR 5/1) clay, dark gray (10YR 4/1), moist; weak medium wedge structure parting to moderate medium subangular blocky; very hard, very firm; common very fine roots; common very fine tubular pores; 15 percent prominent slickensides (pedogenic) on all faces of peds; 1 percent fine distinct dark yellowish brown (10YR 3/4) iron-manganese masses with sharp boundaries on faces of peds; 1 percent fine carbonate nodules; strongly effervescent; slightly alkaline.

A horizon

Hue: 10YR
Value: 3 or 4
Chroma: 1 to 3
Texture: silty clay loam
Clay content: 21 to 35 percent
Calcium carbonate equivalent: 5 to 30 percent
Effervescence: slight or strong
Reaction: slightly alkaline or moderately alkaline

Bw horizon

Hue: 10YR
Value: 4 to 7
Chroma: 2 to 4
Texture: loam, sandy clay loam, clay loam, or silty clay loam
Clay content: 27 to 35 percent
Calcium carbonate equivalent: 15 to 30 percent
Effervescence: slight to violent
Reaction: slightly alkaline or moderately alkaline

Bssb horizon (where present)

Hue: 10YR
Value: 4 or 5
Chroma: 1 to 4
Texture: clay loam, silty clay loam, clay, or silty clay
Clay content: 30 to 55 percent
Calcium carbonate equivalent: 15 to 30 percent
Identifiable secondary calcium carbonate: 0 to 2 percent
Effervescence: slight or strong
Reaction: slightly alkaline or moderately alkaline

Milby Series

The Milby series consists of very deep, moderately well drained soils that formed in sandy and loamy alluvial sediments of Pleistocene age. These gently sloping soils are on stream terraces. Slope ranges from 0 to 2 percent. Soils of the Milby series are loamy, siliceous, active, hyperthermic Arenic Paleudalfs.

Typical pedon of Milby fine sand in an area of Milby fine sand, 0 to 2 percent slopes; from the intersection of Farm Road 622 and Farm Road 2987 in Schroeder, 1.5 miles east on Farm Road 622 to private road, 0.8 mile on private road, and 25 feet west in rangeland. Schroeder USGS topographic quadrangle; Latitude: 28 degrees, 50 minutes, 12.97 seconds North; Longitude: 97 degrees, 12 minutes, 15.14 seconds West; NAD 83.

A—0 to 28 centimeters (0 to 11 inches); pale brown (10YR 6/3) fine sand, very pale brown (10YR 7/3), dry; single grain; loose, loose; common fine roots and very fine roots; moderately acid; clear smooth boundary.

E—28 to 72 centimeters (11 to 28 inches); very pale brown (10YR 7/3) fine sand, very pale brown (10YR 8/3), dry; single grain; loose, loose; common fine roots and common very fine roots; moderately acid; abrupt wavy boundary.

Bt/E—72 to 93 centimeters (28 to 37 inches); pale brown (10YR 6/3) sandy clay loam, very pale brown (10YR 7/3), dry; weak medium subangular blocky structure; friable, hard; common very fine roots; common very fine tubular pores; 4 percent distinct dark gray (10YR 4/1) organic stains on vertical faces of peds; 10 percent distinct very pale brown (10YR 7/3) interfingering of albic material (E) of sand texture on vertical faces of peds; 15 percent distinct grayish brown (10YR 5/2) clay films on all faces of peds; 2 percent medium prominent red (2.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 10 percent coarse prominent reddish yellow (7.5YR 6/8) masses of oxidized iron with sharp boundaries in matrix; moderately acid; gradual wavy boundary.

Bt1—93 to 130 centimeters (37 to 51 inches); light brownish gray (2.5Y 6/2) sandy clay loam, light gray (2.5Y 7/2), dry; moderate medium angular blocky structure; friable, hard; few very fine roots; common very fine tubular pores; 2 percent distinct very pale brown (10YR 7/3) interfingering of albic material of sand texture on vertical faces of peds; 3 percent distinct dark grayish brown (10YR 4/2) organic stains on vertical faces of peds; 20 percent distinct light brownish gray (2.5Y 6/2) clay films on all faces of peds; 2 percent fine prominent red (2.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 5 percent medium prominent brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix; slightly acid; gradual wavy boundary.

Bt2—130 to 155 centimeters (51 to 61 inches); light brownish gray (2.5Y 6/2) sandy clay loam, light gray (2.5Y 7/2), dry; moderate coarse angular blocky structure; friable, hard; few very fine roots; few very fine tubular pores; 15 percent prominent light brownish gray (2.5Y 6/2) clay films on all faces of peds; 3 percent fine prominent yellow (2.5Y 7/6) masses of oxidized iron with sharp boundaries in matrix; slightly acid; gradual wavy boundary.

Bt3—155 to 203 centimeters (61 to 80 inches); light gray (2.5Y 7/2) sandy clay loam, pale yellow (2.5Y 8/2), dry; weak coarse subangular blocky structure; friable, hard; 10 percent distinct light brownish gray (2.5Y 6/2) clay films on all faces of peds; 5 percent medium prominent brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix; slightly acid.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: fine sand
Reaction: strongly acid to neutral

E horizon

Hue: 7.5YR or 10YR
Value: 6 to 8
Chroma: 2 to 4
Texture: sand or fine sand
Reaction: strongly acid to neutral

Bt/E horizon

Hue: Bt part—10YR; E part—7.5YR or 10YR
Value: Bt part—4 to 7; E part—6 to 8
Chroma: Bt part—3 to 6; E part—2 to 4
Texture: sandy clay or clay loam
Redox concentrations: amount—1 to 8 percent; shades—red, brown, or yellow
Reaction: strongly acid or moderately acid

Bt horizon

Hue: 10YR or 2.5Y
Value: 4 to 7
Chroma: 2 to 6
Texture: clay loam or sandy clay loam
Redox concentrations: amount—2 to 25 percent; shades—red, brown, or yellow
Reaction: very strongly acid to slightly acid

Monteola Series

The Monteola series consists of very deep, well drained, very slowly permeable soils. These soils formed in clays and clays interbedded with sandstone and shale of the Oakville and Fleming Formation. These gently to moderately sloping soils occur on hills on inland dissected coastal plains. Slope ranges from 0 to 5 percent. Soils of the Monteola series are fine, smectitic, hyperthermic Typic Haplusterts.

Typical pedon of Monteola clay, in an area of Monteola clay, 1 to 3 percent slopes; in Kenedy in Karnes County, from the intersection of U.S. Highway 181 and Texas Highway 72, 9.6 miles west on Texas Highway 72, 0.8 mile north on county road, and 100 feet east in cropland. Kenedy USGS topographic quadrangle; Latitude: 28 degrees, 44 minutes, 35 seconds North; Longitude: 97 degrees, 58 minutes, 28 seconds West; NAD 83.

Ap—0 to 13 centimeters (0 to 5 inches); very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; moderate fine and very fine subangular blocky structure; surface has a mulch of very hard discrete fine granules; very hard, very firm, very plastic and very sticky; many fine roots; few snail shell fragments; few very fine strongly cemented calcium carbonate concretions; strongly effervescent; moderately alkaline; abrupt smooth boundary.

A—13 to 31 centimeters (5 to 12 inches); very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; moderate fine and very fine subangular blocky structure; very hard, very firm, very sticky and very plastic; many fine roots; few snail shell fragments; few very fine strongly cemented calcium carbonate concretions; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bss—31 to 66 centimeters (12 to 26 inches); very dark gray (10YR 3/1) clay, black (10YR 2/1) moist; common wedge shaped peds tilted about 10 degrees to 30 degrees parting to moderate fine and very fine angular blocky structure; extremely hard, very firm, very sticky and very plastic; many fine roots; few prominent slickensides up to about 15 centimeters (6 inches) across the long axes; few snail shell fragments; few fine strongly cemented calcium carbonate concretions; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bkssy1—66 to 94 centimeters (26 to 37 inches); grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; many distinct wedge shaped peds tilted about 30 degrees parting to moderate fine angular blocky structure; extremely hard, very firm, very sticky, very plastic; common fine roots; few prominent slickensides up to about 15 centimeters (6 inches) across the long axes; few fine shell fragments; few fine weakly cemented calcium carbonate concretions; few seams and pockets of gypsum and other salts in lower part; cracks partially filled with very dark gray (10YR 3/1); strongly effervescent; moderately alkaline; gradual wavy boundary.

Bkssy2—94 to 127 centimeters (37 to 50 inches); very pale brown (10YR 7/3) clay, pale brown (10YR 6/3) moist, common distinct wedge shaped peds tilted about 30 degrees parting to moderate fine angular blocky structure; extremely hard, very firm, very sticky, very plastic; few fine roots; few prominent slickensides up to about 10 centimeters (4 inches) across the long axes; few vertical streaks of very dark gray (10YR 3/1) along apparently filled cracks; few seams of gypsum crystals, few weakly cemented calcium carbonate concretions; very slightly saline; strongly effervescent; moderately alkaline; clear wavy boundary.

BCkyz—127 to 203 centimeters (50 to 80 inches); light gray (5Y 7/1) clay, gray (5Y 6/1) moist; structureless, but has vertical and horizontal fractures in the clay, especially along apparent bedding planes; extremely hard, extremely firm, very sticky and very plastic; the soil is coated with powdery calcium carbonate along fracture planes; contains about 2 percent of calcium carbonate coated siliceous pebbles up to about 3 centimeters (1.5 inches) in diameter; few fine weakly cemented calcium carbonate concretions; few fine soft barite masses; few seams of gypsum crystals; slightly saline; strongly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 2 to 4
Chroma: 1
Texture: clay
Other features: Thickness of the A horizon in individual pedons varies from the microhighs to the microlows, being thinnest in the microhighs and thickest in the microlows. The amplitude of the boundary between the A and B horizons ranges from 13 to 35 centimeters (5 to 14 inches). The soil cracks 1 to 5 centimeters (0.4 to 2 inches) wide at the surface when dry, and the cracks extend to a depth of 50 centimeters (20 inches) or more.
Effervescence: slight to strong
Reaction: slightly alkaline to strongly alkaline

Bss horizon

Hue: 10YR or 2.5Y
Value: 3 to 7
Chroma: 1 to 4
Texture: clay
Redox concentrations: amount—0 to 2; shades—brown and yellow
Rock fragments: amount—0 to 3 percent; kind—siliceous; size—pebbles
Identifiable secondary calcium carbonate: amount—0 to 5 percent; kind—crystals, nodules, and powdery masses
Gypsum: amount—1 to 8 percent; kind—crystals
Effervescence: slight to strong
Reaction: slightly alkaline to strongly alkaline

Bkssy or Bkss horizon (where present)

Hue: 10YR or 2.5Y
Value: 4 to 7
Chroma: 2 to 6
Texture: clay
Redox concentrations: amount—0 to 2; shades—brown and yellow
Rock fragments: amount—0 to 3 percent; kind—siliceous; size—pebbles
Identifiable secondary calcium carbonate: amount—0 to 5 percent; kind—crystals, nodules, and powdery masses
Gypsum: amount—1 to 8 percent; kind—crystals
Effervescence: slight to strong
Reaction: slightly alkaline to strongly alkaline

BCkyz or BCky horizon (where present)

Hue: 10YR to 5Y
Value: 6 to 8
Chroma: 1 to 8
Texture: clay
Redox concentrations: amount—0 to 2; shades—brown and yellow
Rock fragments: amount—0 to 3 percent; kind—siliceous; size—pebbles
Identifiable secondary calcium carbonate: amount—0 to 5 percent; kind—crystals, nodules, and powdery masses
Gypsum: amount—1 to 8 percent; kind—crystals
Other salt crystals: amount—1 to 5 percent; kind—crystals
Effervescence: slight to strong
Reaction: slightly alkaline to strongly alkaline

Nusil Series

The Nusil series consists of very deep, well drained, slowly permeable soils. These nearly level to moderately sloping soils formed in loamy alluvium of Quaternary age overlain by eolian sands of Holocene age. Slope ranges from 1 to 5 percent. Soils of the Nusil series are loamy, siliceous, active, hyperthermic Arenic Paleustalfs.

Typical pedon of Nusil fine sand in an area of Nusil fine sand, 1 to 5 percent slopes; from the intersection of U.S. Highway 59 and Texas Highway 239 west of Goliad, 9 miles southwest on U.S. Highway 59 to Riverdale Road, 1.8 miles north on Riverdale Road to ranch road, 1 mile southwest on ranch road, 0.7 mile west-southwest, 0.5 mile south, and 0.1 mile north in rangeland. Berclair USGS topographic quadrangle; Latitude: 28 degrees, 34 minutes, 36.11 seconds North; Longitude: 97 degrees, 33 minutes, 13.60 seconds West; NAD 83.

A—0 to 13 centimeters (0 to 5 inches); pale brown (10YR 6/3) fine sand, brown (10YR 5/3), moist; single grain; loose; common very fine and fine roots; common very fine pores; slightly acid; clear smooth boundary.

E—13 to 58 centimeters (5 to 23 inches); very pale brown (10YR 7/3) fine sand, pale brown (10YR 6/3), moist; single grain; loose; common very fine and fine roots; common very fine pores; slightly acid; abrupt smooth boundary.

Bt1—58 to 79 centimeters (23 to 31 inches); light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2), moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, friable; common very fine roots; common very fine tubular pores; 10 percent distinct gray (10YR 5/1) clay films; 2 percent fine prominent reddish yellow (5YR 6/8) masses of oxidized iron with sharp boundaries in matrix; 8 percent fine and medium prominent reddish yellow (7.5YR 6/8) masses of oxidized iron with sharp boundaries in matrix; slightly acid; clear smooth boundary.

Bt2—79 to 99 centimeters (31 to 39 inches); pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3), moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, firm; few very fine roots; few very fine tubular pores; 20 percent prominent gray (10YR 5/1) clay films; 2 percent fine distinct gray (10YR 6/1) iron depletions with sharp boundaries in matrix; 2 percent fine prominent reddish yellow (5YR 6/8) masses of oxidized iron with sharp boundaries in matrix; 3 percent fine prominent reddish yellow (7.5YR 6/8) masses of oxidized iron with sharp boundaries in matrix; slightly acid; clear smooth boundary.

Bt3—99 to 119 centimeters (39 to 47 inches); light gray (10YR 7/2) sandy clay loam, light brownish gray (10YR 6/2), moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse angular blocky; hard, firm; few very fine roots; 20 percent prominent brown (10YR 5/3) clay films; 2 percent fine and medium prominent brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix; 2 percent fine and medium prominent red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; neutral; clear smooth boundary.

Bt4—119 to 135 centimeters (47 to 53 inches); light gray (10YR 7/2) sandy clay loam, light brownish gray (10YR 6/2), moist; weak coarse prismatic structure parting to weak coarse subangular blocky; hard, firm; 20 percent prominent gray (10YR 6/1) clay films; 2 percent fine and medium prominent brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix; 1 percent fine carbonate masses; neutral; clear smooth boundary.

Bt5—135 to 198 centimeters (53 to 78 inches); light gray (10YR 7/2) fine sandy loam, light brownish gray (10YR 6/2), moist; weak coarse subangular blocky structure; slightly hard, friable; 15 percent prominent light gray (10YR 7/2) clay films; 1 percent fine prominent yellow (10YR 7/8) masses of oxidized iron with sharp boundaries in matrix; 3 percent fine and medium prominent black (10YR 2/1) iron-manganese masses; slightly alkaline; clear smooth boundary.

Bt6—198 to 203 centimeters (78 to 80 inches); very pale brown (10YR 7/3) fine sandy loam, pale brown (10YR 6/3), moist; weak coarse subangular blocky structure; soft, friable; 10 percent prominent light gray (10YR 7/2) clay films; slightly alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: fine sand
Clay content: 3 to 10 percent
Reaction: slightly acid to slightly alkaline

E horizon

Hue: 7.5YR or 10YR
Value: 6 or 7
Chroma: 2 to 4
Texture: fine sand or loamy fine sand
Clay content: 3 to 10 percent
Redox concentrations: amount—0 to 10 percent; size—fine and medium; contrast—faint or distinct; boundaries—sharp; location—throughout; shades—brown and yellow
Reaction: slightly acid to slightly alkaline

Bt horizon and Btk horizon (where present)

Hue: 7.5YR or 10YR
Value: 4 to 7
Chroma: 2 to 6
Texture: fine sandy loamy or sandy clay loam
Clay content: 18 to 35 percent
Redox concentrations (relict): amount—2 to 25 percent; size—fine to coarse; contrast—distinct; boundaries—sharp; location—throughout; shades—red, brown, and yellow
Redox depletions (relict): amount—0 to 2 percent; size—fine; boundaries—sharp; location—throughout; shades—gray
Iron-manganese concentrations: amount—0 to 5 percent; size—fine; kind—masses
Identifiable secondary calcium carbonate: amount—0 to 5 percent; size—fine; kind—masses; location—throughout
Effervescence: none to strong
Reaction: slightly acid to moderately alkaline

Odem Series

The Odem series consists of very deep, well drained soils that formed in loamy alluvial sediments of Holocene age. These nearly level to gently sloping soils are on natural levees along streams and rivers. Slope ranges from 0 to 1 percent. Soils of the Odem series are coarse-loamy, mixed, superactive, hyperthermic Cumulic Haplustolls.

Typical pedon of Odem fine sandy loam in an area of Odem-Riverwash, 0 to 1 percent slopes, frequently flooded; from the intersection of U.S. Highway 59 and Bowers Street in Berclair, about 0.25 mile south on Bowers Street to Lucas Road, 3.2 miles east on Lucas Road to Power Road, 3.4 miles south on Power Road to private road, about 1.5 miles south on private road to pipeline right-of-way, about 0.9 mile northeast on right-of-way to bank of creek, and 20 feet north on natural levee of creek. Skidmore NE USGS topographic quadrangle; Latitude: 28 degrees, 27 minutes, 54.60 seconds North; Longitude: 97 degrees, 30 minutes, 36.60 seconds West; NAD 83.

A1—0 to 33 centimeters (0 to 13 inches); dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2), moist; weak fine granular structure; very friable, soft; common fine to coarse roots and many very fine roots; many fine and medium interstitial and tubular pores; neutral; gradual smooth boundary.

A2—33 to 71 centimeters (13 to 28 inches); very dark grayish brown (10YR 3/2) fine sandy loam, dark grayish brown (10YR 4/2), moist; weak fine granular structure; very friable, soft; common very fine to medium roots; common very fine to medium interstitial and tubular pores; neutral; gradual smooth boundary.

Bw1—71 to 99 centimeters (28 to 39 inches); grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2), moist; weak coarse subangular blocky structure; very friable, soft; common fine roots and common medium roots and many very fine roots; common fine tubular and common very fine tubular pores; neutral; gradual smooth boundary.

Bw2—99 to 150 centimeters (39 to 59 inches); brown (10YR 5/3) loamy fine sand, brown (10YR 4/3), moist; weak coarse subangular blocky structure; very friable, soft; common very fine and fine roots; common very fine tubular pores; neutral; gradual smooth boundary.

C1—150 to 173 centimeters (59 to 68 inches); pale brown (10YR 6/3) loamy fine sand, brown (10YR 5/3), moist; massive; loose, loose; common very fine roots; common very fine tubular pores; neutral; gradual smooth boundary.

C2—173 to 203 centimeters (68 to 80 inches); very pale brown (10YR 7/3) fine sandy loam, very pale brown (10YR 7/3), moist; massive; loose, loose; common very fine roots; common very fine tubular pores; neutral.

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 1 to 3
Texture: fine sandy loam
Effervescence: none or very slight
Reaction: slightly acid to moderately alkaline

Bw1 horizon

Hue: 10YR
Value: 3 to 5
Chroma: 1 to 3
Texture: loamy fine sand, fine sandy loam, or loam
Effervescence: none or very slight
Reaction: neutral to moderately alkaline

Bw2 horizon

Hue: 10YR
Value: 4 to 7
Chroma: 1 to 3
Texture: loamy fine sand, fine sandy loam, or loam
Other features: Some pedons have thin strata of various textures ranging from sandy clay loam to sand.
Effervescence: none or very slight
Reaction: neutral to moderately alkaline

C horizon

Hue: 10YR
Value: 5 to 7
Chroma: 1 to 3
Texture: loamy fine sandy, fine sandy loam, or loam
Other features: Some pedons have thin strata of various textures ranging from sandy clay loam to sand.
Effervescence: none or very slight
Reaction: neutral to moderately alkaline

Olmedo Series

The Olmedo series consists of soils that are very shallow and shallow over a petrocalcic horizon. These well drained, moderately permeable soils formed in calcareous, loamy residuum of the Goliad Formation of Miocene-Pliocene age. These nearly level to undulating soils are on summits on interfluves or ridges. Slope ranges from

1 to 8 percent. Soils of the Olmedo series are loamy-skeletal, carbonatic, hyperthermic, shallow Petrocalcic Calciustolls.

Typical pedon of Olmedo very gravelly loam (fig. 35) in an area of Olmedo very gravelly loam, 1 to 8 percent slopes; from the intersection of Farm Road 2442 and Farm Road 883 in the western part of the county, 3.0 miles northeast on Farm Road 2442 to ranch road, 1 mile southeast along ranch road to pipeline right-of-way, 0.5 mile southwest on right-of-way to northwest running road, 0.1 mile northwest on road, and 25 feet north in rangeland. Berclair NW USGS topographic quadrangle; Latitude: 28 degrees, 39 minutes, 36.10 seconds North; Longitude: 97 degrees, 41 minutes, 6.80 seconds West; NAD 83.

Figure 35.—Profile of the Olmedo very gravelly loam, 1 to 8 percent slopes. A petrocalcic horizon starts at about 45 centimeters (18 inches) from the surface. (Scale in centimeters.)

A1—0 to 15 centimeters (0 to 6 inches); dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2), moist; weak very fine and fine subangular blocky structure; soft, friable; 5 percent flat angular indurated 30 to 50 millimeters (1 to 2 inches) petrocalcic fragments and 30 percent nonflat subangular strongly cemented 3 to 30 millimeters (1/4 to 1 inches) petrocalcic fragments; strongly effervescent; moderately alkaline; gradual smooth boundary.

A2—15 to 36 centimeters (6 to 14 inches); dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2), moist; weak very fine and fine subangular blocky structure; soft, friable; 1 percent nonflat rounded noncemented 3 to 11 millimeters charcoal fragments; 10 percent flat angular indurated 8 to 50 millimeters (1/3 to 2 inches) petrocalcic fragments and 32 percent nonflat subangular indurated 3 to 50 millimeters (1/4 to 2 inches) petrocalcic fragments; strongly effervescent; moderately alkaline; abrupt smooth boundary.

Bkm—36 to 58 centimeters (14 to 23 inches); very pale brown (10YR 8/2), light gray (10YR 7/2), moist; massive; rigid, rigid, strongly cemented laminar cap in upper 5 centimeters (2 inches); violently effervescent; moderately alkaline; gradual wavy boundary.

BCk—58 to 203 centimeters (23 to 80 inches); very pale brown (10YR 8/2) caliche of silt loam texture; moderately cemented at the top of the horizon and decreases with depth; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 1 to 3
Texture: very gravelly loam
Clay content: 12 to 22 percent
Rock fragments: 35 to 85 percent
Calcium carbonate equivalent: 10 to 70 percent
EC (dS/m): 0 to 1
SAR: 0 to 1
Effervescence: strong to violent
Reaction: slightly alkaline or moderately alkaline

Bkm horizon

Hue: 10YR
Value: 8
Chroma: 1 or 2
Texture: indurated calcium carbonate (petrocalcic)
Calcium carbonate equivalent: 40 to 80 percent
EC (dS/m): 0 to 1
SAR: 0 to 1
Reaction: slightly alkaline or moderately alkaline

BCk horizon

Hue: 7.5 YR or 10YR
Value: 7 or 8
Chroma: 1 to 3
Texture: sandy loam or silt loam and gravelly, very gravelly or extremely gravelly counterparts
Clay content: 4 to 12 percent
Rock fragments: 2 to 40 percent
Calcium carbonate equivalent: 40 to 75 percent

Identifiable secondary calcium carbonate: amount—10 to 40 percent; size—fine and medium; kind—masses; location—throughout
EC (dS/m): 1 to 5
SAR: 0 to 14
Effervescence: strong or violent
Reaction: slightly alkaline or moderately alkaline

Orelia Series

The Orelia series consists of very deep, well drained, slowly permeable soils that formed in loamy fluviomarine deposits of Pleistocene age. These nearly level soils are on flats on coast plains. Slope is 0 to 1 percent. Soils of the Orelia series are fine-loamy, mixed, superactive, hyperthermic Typic Argiustolls.

Typical pedon of Orelia fine sandy loam (fig. 36) in an area of Orelia fine sandy loam, 0 to 1 percent slopes; from the intersection of Farm Road 3410 and Farm Road 2441 in the southern part of the county, 2.9 miles north on Farm Road 2441 to private road, 1.0 mile southwest on private road, about 0.8 mile north, 1 mile southwest on road, and 25 feet south in pastureland. Berclair NW USGS topographic quadrangle; Latitude: 28 degrees, 26 minutes, 27.60 seconds North; Longitude: 97 degrees, 26 minutes, 26.20 seconds West; NAD 83.

A—0 to 12 centimeters (0 to 5 inches); dark gray (10YR 4/1) fine sandy loam, very dark gray (10YR 3/1), moist; weak fine subangular blocky structure; friable, slightly hard; common very fine and fine roots; many fine vesicular and common very fine and fine tubular pores; 1 percent fine faint brown (10YR 4/3) masses of oxidized iron with sharp boundaries lining pores; neutral; abrupt smooth boundary.

Bt1—12 to 36 centimeters (5 to 14 inches); very dark gray (10YR 3/1) clay loam, very dark gray (10YR 3/1), moist; moderate medium subangular blocky structure; firm, hard; common very fine roots; common very fine tubular pores; 10 percent distinct very dark gray (10YR 3/1) clay films; 1 percent fine faint brown (10YR 4/3) masses of oxidized iron with sharp boundaries lining pores; neutral; clear smooth boundary.

Bt2—36 to 53 centimeters (14 to 21 inches); dark gray (10YR 4/1) sandy clay loam, dark gray (10YR 4/1), moist; moderate medium and coarse subangular blocky structure; firm, hard; common very fine roots; common very fine tubular pores; 15 percent distinct very dark gray (10YR 3/1) clay films; neutral; clear wavy boundary.

Bt3—53 to 80 centimeters (21 to 32 inches); grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2), moist; moderate coarse subangular blocky structure; friable, moderately hard; few very fine roots; common very fine tubular pores; 5 percent distinct dark grayish brown (10YR 4/2) organic stains on vertical faces of peds and 20 percent distinct dark grayish brown (10YR 4/2) clay films; slightly alkaline; gradual wavy boundary.

Bt4—80 to 98 centimeters (32 to 39 inches); light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2), moist; weak coarse subangular blocky structure; firm, moderately hard; few very fine roots; common very fine tubular pores; 5 percent distinct dark gray (10YR 4/1) organic stains on vertical faces of peds and 10 percent distinct dark grayish brown (10YR 4/2) clay films; slightly alkaline; clear wavy boundary.

Btk1—98 to 151 centimeters (39 to 59 inches); light gray (10YR 7/2) sandy clay loam, light gray (10YR 7/2), moist; weak coarse subangular blocky structure; firm, hard; 5 percent distinct dark gray (10YR 4/1) organic stains on vertical faces of peds

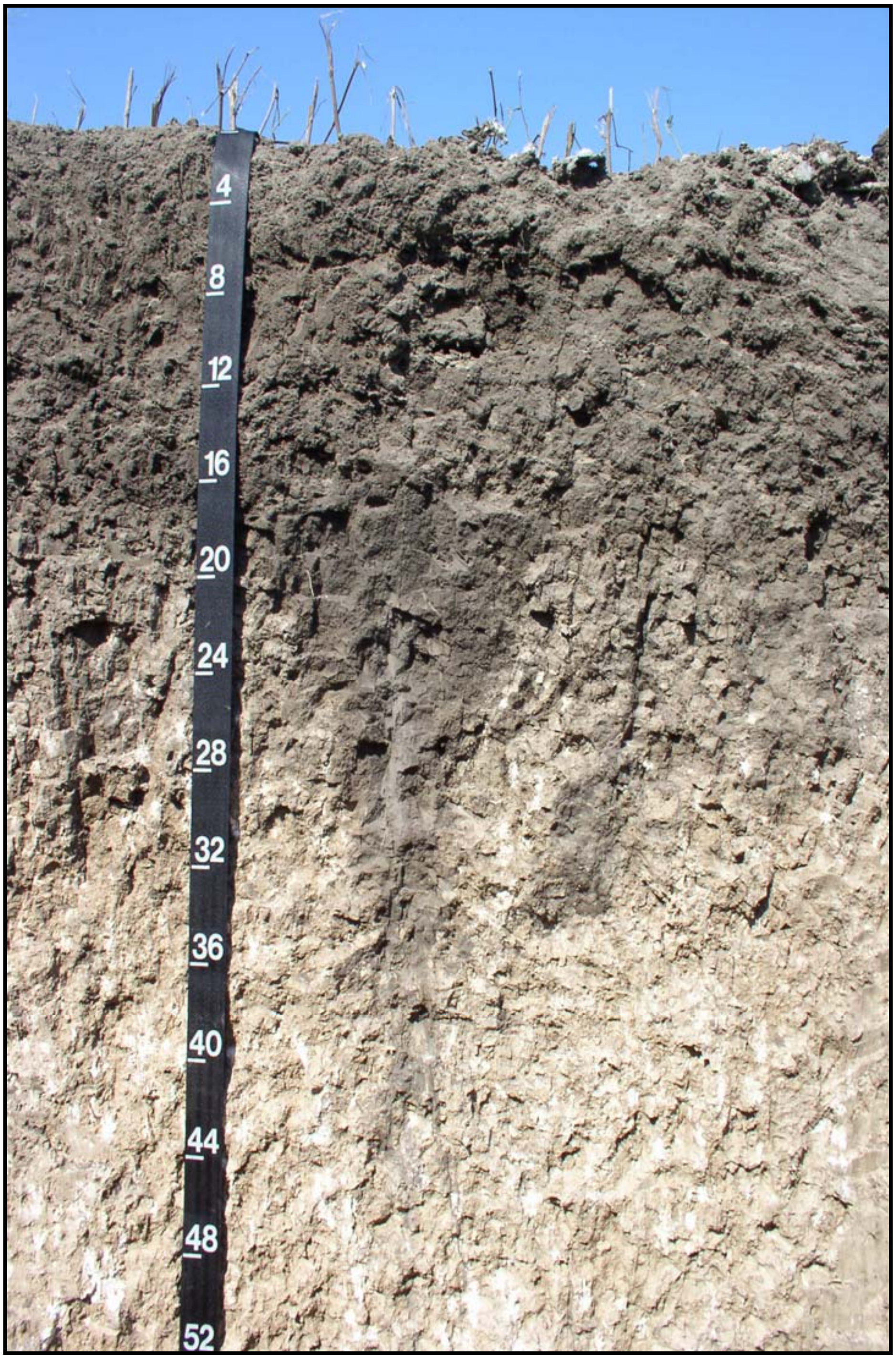

Figure 36.—Profile of Orelia fine sandy loam, 0 to 1 percent slopes. The lighter colors below a depth of 32 inches are influenced by lime or calcium carbonate. (Scale in inches.)

and 10 percent distinct grayish brown (10YR 5/2) clay films; 1 percent fine carbonate masses; moderately alkaline; gradual wavy boundary.

Btk2—151 to 203 centimeters (59 to 80 inches); light gray (2.5Y 7/2) sandy clay loam, light gray (2.5Y 7/2), moist; weak coarse subangular blocky structure; firm, hard; 5 percent distinct dark grayish brown (10YR 4/2) organic stains on vertical faces of peds and 10 percent distinct grayish brown (10YR 5/2) clay films; 2 percent fine carbonate masses; moderately alkaline.

A horizon

Hue: 10YR
Value: 2 to 4
Chroma: 1 or 2
Texture: fine sandy loam
Clay content: 10 to 23 percent
EC (dS/m): 0 to 0.5
SAR: 0 to 4
Reaction: slightly acid or neutral

Upper Bt horizon

Hue: 10YR
Value: 2 to 4
Chroma: 1 or 2
Texture: sandy clay loam or clay loam
Clay content: 25 to 37 percent
Redox concentrations: amount—0 to 2 percent; shades—brown
EC (dS/m): 0.2 to 0.7
SAR: 0 to 6
Reaction: slightly acid or neutral

Lower Bt horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: sandy clay loam or clay loam
Clay content: 25 to 33 percent
Redox concentrations: amount—0 to 2 percent; shades—brown
EC (dS/m): 0.2 to 2
SAR: 2 to 12
Reaction: neutral or slightly alkaline

Btk horizon

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 2 or 3
Texture: sandy clay loam or clay loam
Clay content: 23 to 33 percent
Redox concentrations: amount—0 to 2 percent; shades—brown
Calcium carbonate equivalent: 5 to 15 percent
Identifiable secondary calcium carbonate: amount—2 to 8 percent; kind—nodules or masses
EC (dS/m): 1 to 4
SAR: 6 to 14
Effervescence: very slight to strong
Reaction: moderately alkaline or strongly alkaline

Papalote Series

The Papalote series consists of very deep, moderately well drained soils that formed in loamy and clayey sediments of Pleistocene and Pliocene age. These nearly level to gently sloping soils are on ancient broad stream terraces of inland dissected coastal plains. Slope ranges from 0 to 3 percent. Soils of the Papalote series are fine, smectitic, hyperthermic Typic Paleustalfs.

Typical pedon of Papalote loamy sand in an area of Papalote loamy sand, 0 to 3 percent slopes; from the intersection of Farm Road 622 and the Farm Road 2987 in Schroeder, 2 miles south on Farm Road 2987 to private road, 0.2 mile east on private road to a south running road, 0.3 mile south on road, and 50 feet west in rangeland. Schroeder USGS topographic quadrangle; Latitude 28 degrees, 47 minutes, 8.62 seconds North; Longitude: 97 degrees, 13 minutes, 0.24 seconds West; NAD 83.

A—0 to 22 centimeters (0 to 9 inches); grayish brown (10YR 5/2) loamy sand, dark grayish brown (10YR 4/2), moist; single grain; very friable, soft; common very fine roots; common very fine tubular pores; 1 percent fine faint brown (10YR 4/3) masses of oxidized iron with sharp boundaries lining pores; neutral; abrupt smooth boundary.

Bt1—22 to 53 centimeters (9 to 21 inches); grayish brown (10YR 5/2) sandy clay, dark grayish brown (10YR 4/2), moist; moderate medium prismatic structure parting to moderate medium angular blocky; very firm, very hard; common very fine roots; common very fine tubular pores; 20 percent distinct dark grayish brown (10YR 4/2) clay films on all faces of peds; 3 percent fine strong brown (7.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 1 percent fine and medium brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix; moderately acid; clear wavy boundary.

Bt2—53 to 71 centimeters (21 to 28 inches); gray (10YR 5/1) sandy clay, gray (10YR 6/1), moist; moderate medium prismatic structure parting to moderate medium angular blocky; very firm, very hard; common very fine roots; common very fine tubular pores; 20 percent distinct grayish brown (10YR 5/2) clay films on all faces of peds; 2 percent fine and medium fine reddish yellow (7.5YR 6/8) masses of oxidized iron with sharp boundaries in matrix; 8 percent fine and medium brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix; moderately acid; gradual wavy boundary.

Bt3—71 to 91 centimeters (28 to 36 inches); pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3), moist; weak coarse prismatic structure parting to moderate coarse angular blocky; firm, hard; few very fine roots; few very fine tubular pores; 30 percent prominent grayish brown (10YR 5/2) clay films on all faces of peds; 3 percent medium red (2.5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; 5 percent fine and medium brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix; slightly acid; clear wavy boundary.

Btk1—91 to 118 centimeters (36 to 47 inches); reddish brown (5YR 5/4) sandy clay loam, yellowish reddish brown (5YR 5/4), moist; moderate coarse subangular or angular blocky; firm, hard; 25 percent prominent red (2.5YR 4/8) clay films on all faces of peds; 1 percent fine medium carbonate nodules; moderately alkaline; gradual wavy boundary.

Btk2—118 to 154 centimeters (47 to 61 inches); brown (7.5YR 5/4) loam, light brown (7.5YR 6/4), moist; weak coarse subangular or angular blocky friable, moderately hard; 15 percent distinct brown (7.5YR 5/4) clay films on all faces of peds; 5 percent medium carbonate masses; 2 percent fine and medium carbonate nodules; moderately alkaline; gradual wavy boundary.

Bk—154 to 203 centimeters (61 to 80 inches); very pale brown (10YR 8/3) sandy clay loam, very pale brown (10YR 7/3), moist; weak coarse subangular or angular blocky friable, moderately hard; 2 percent fine and medium carbonate nodules; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 1 to 4
Texture: loamy sand or fine sandy loam
Reaction: moderately acid to slightly alkaline

E horizon (where present)

Hue: 10YR
Value: 4 to 8
Chroma: 1 to 4
Texture: loamy coarse sand, loamy fine sand, or fine sandy loam
Thickness: 3 to 15 centimeters (1 to 6 inches)
Reaction: moderately acid to slightly alkaline

Upper Bt horizon

Hue: 7.5YR or 10YR
Value: 3 to 7
Chroma: 1 to 3
Texture: sandy clay or clay
Clay content: 35 to 55 percent
Redox concentrations: amount—few to many; shades—red, brown, or yellow
Redox depletions: amount—few or common; shades—gray
Reaction: moderately acid to slightly alkaline

Lower Bt horizon

Hue: 5YR to 10YR
Value: 4 to 7
Chroma: 2 to 4
Texture: sandy clay loam or sandy clay
Clay content: 22 to 38 percent
Redox concentrations: amount—few to many; shades—red, brown, or yellow
Redox depletions: amount—none or common; shades—gray
Reaction: slightly acid to moderately alkaline

Btk horizon (where present)

Hue: 5YR to 10YR
Value: 4 to 7
Chroma: 2 to 4
Texture: loam, sandy clay loam, clay loam, or sandy clay
Clay content: 25 to 40 percent
Redox concentrations: amount—few to common; shades—red, brown, or yellow
Identifiable secondary calcium carbonate: amount—1 to 5 percent; kind—threads, films, and masses
Effervescence: very slight to strong
Reaction: neutral to moderately alkaline

Bk horizon (where present)

Hue: 5YR to 10YR
Value: 5 to 8
Chroma: 2 to 8
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 25 to 40 percent
Identifiable secondary calcium carbonate: amount—2 to 30 percent; kind—concretions and masses
Effervescence: slight to violent
Reaction: slightly alkaline or moderately alkaline

Parrita Series

The Parrita series consists of shallow, well drained soils that formed in loamy sediments derived from calcareous sandstone of the Goliad Formation of Pliocene age. These nearly level to gently sloping soils are on shoulders of hills on the coastal plain. Slope ranges from 0 to 5 percent. Soils of the Parrita series are loamy, mixed, superactive, hyperthermic, shallow Petrocalcic Paleustolls.

Typical pedon of Parrita sandy clay loam in an area of Parrita sandy clay loam, 0 to 3 percent slopes; from the intersection of Farm Road 239 and U.S. Highway 59 west of Goliad, 1.9 miles west on Farm Road 239 to private ranch road, about 2.2 miles north on ranch road, and 100 feet east in rangeland. Goliad USGS topographic quadrangle; Latitude: 28 degrees, 41 minutes, 34.00 seconds North; Longitude: 97 degrees, 26 minutes, 59.00 seconds West; NAD 83.

A—0 to 15 centimeters (0 to 6 inches); very dark grayish brown (10YR 3/2) sandy clay loam, very dark brown (10YR 2/2), moist; weak fine and medium granular structure; soft, very friable; common very fine roots; common very fine tubular pores; slightly alkaline; abrupt smooth boundary.

Bt—15 to 25 centimeters (6 to 10 inches); dark brown (7.5YR 3/2), sandy clay loam, dark brown (7.5YR 3/2), moist; weak medium subangular blocky structure; slightly hard, friable; common very fine roots; common very fine tubular pores; 10 percent distinct very dark brown (10YR 2/2) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Btk—25 to 46 centimeters (10 to 18 inches); yellowish red (7.5YR 5/6), sandy clay loam, yellowish red (5YR 4/6), moist; moderate medium subangular blocky structure; hard, firm; common very fine roots between peds; common very fine tubular pores; 20 percent distinct clay films on faces of peds; 1 percent silica concretions; 2 percent carbonate nodules; matrix is noneffervescent; moderately alkaline; abrupt smooth boundary.

Bkkm—46 to 84 centimeters (18 to 33 inches); pink (7.5YR 8/4), pink (7.5YR 7/4), moist; massive; extremely hard, slightly rigid, strongly cemented; common very fine roots on top of horizon; violently effervescent; moderately alkaline; gradual smooth boundary.

BCk—84 to 203 centimeters (33 to 80 inches); reddish yellow (7.5YR 8/6), loam, reddish yellow (7.5YR 7/6), moist; massive; hard, firm; 10 percent coarse carbonate masses; violently effervescent, moderately alkaline.

A horizon

Hue: 5YR to 10YR
Value: 2 to 4
Chroma: 1 to 3
Texture: sandy clay loam

Clay content: 15 to 25 percent
Reaction: neutral to moderately alkaline

Bt Horizon

Hue: 2.5YR to 7.5YR
Value: 3 or 4
Chroma: 2 to 6
Texture: sandy clay loam or sandy clay
Clay content: 27 to 35 percent
Reaction: neutral to moderately alkaline

Btk horizon

Hue: 2.5YR to 7.5YR
Value: 2 to 5
Chroma: 3 to 6
Texture: sandy clay loam (some pedons contain a thin gravelly or very gravelly zone that is transitional to the petrocalcic)
Clay content: 25 to 33 percent
Calcium carbonate equivalent: 0 to 15 percent
Identifiable secondary calcium carbonate: amount—1 to 10 percent; size—5 to 15 millimeters; kind—petrocalcic fragments
Effervescence: none to strong
Reaction: slightly alkaline or moderately alkaline

Bkkm horizon

Hue: 7.5YR or 10YR
Value: 7 or 8
Chroma: 1 to 4
Texture: cemented or indurated caliche with a laminar cap that breaks to plate-like fragments. In some pedons it becomes less cemented with depth.

BCk horizon

Hue: 2.5YR to 7.5YR
Value: 7 or 8
Chroma: 3 to 6
Texture: loam
Clay content: 20 to 30 percent
Calcium carbonate equivalent: 25 to 60 percent
Identifiable secondary calcium carbonate: amount—5 to 15 percent; size—5 to 50 millimeters; kind—petrocalcic fragments, masses, or nodules

Pernitas Series

The Pernitas series consists of very deep, well drained, moderately permeable soils that formed in calcareous loamy alluvium of Pleistocene and Pliocene ages. These nearly level to moderately sloping soils are on summits, backslopes, and footslopes of paleoterraces. Slope ranges from 2 to 5 percent. Soils of the Pernitas series are fine-loamy, mixed, superactive, hyperthermic Typic Argiustolls.

Typical pedon of Pernitas sandy clay loam in an area of Pernitas sandy clay loam, 1 to 5 percent slopes; from the intersection of Farm Road 1351 and Newton-Powell Road southwest of Goliad, 2.8 miles west on Newton-Powell Road to private road, 1.6 miles south on ranch road, 0.3 mile west on ranch road, and 100 feet in rangeland. Berclair NW USGS topographic quadrangle; Latitude: 28 degrees, 39 minutes, 34.40 seconds North; Longitude: 97 degrees, 38 minutes, 5.60 seconds West; NAD 83.

A—0 to 28 centimeters (0 to 11 inches); very dark grayish brown (10YR 3/2) sandy clay loam, very dark brown (10YR 2/2), moist; moderate medium subangular blocky structure; firm, hard, moderately sticky, moderately plastic; common fine and medium roots; slightly effervescent; slightly alkaline; clear smooth boundary.

Bt1—28 to 51 centimeters (11 to 20 inches); brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4), moist; 41 percent sand; weak coarse prismatic structure parting to moderate coarse angular blocky; firm, hard, moderately sticky, moderately plastic; common medium roots; 10 percent discontinuous distinct clay films on all faces of peds; strongly effervescent; moderately alkaline; clear smooth boundary.

Bt2—51 to 74 centimeters (20 to 29 inches); light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4), moist; weak coarse prismatic structure parting to weak coarse subangular blocky; firm, hard, moderately sticky, moderately plastic; common fine roots; 10 percent discontinuous distinct clay films on all faces of peds; 4 percent fine carbonate masses in matrix; strongly effervescent; moderately alkaline; clear smooth boundary.

Btk1—74 to 107 centimeters (29 to 42 inches); light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4), moist; weak coarse subangular structure; firm, hard, moderately sticky, moderately plastic; common fine roots; 15 percent fine and medium carbonate masses in matrix; strongly effervescent; moderately alkaline; gradual smooth boundary

Btk2—107 to 203 centimeters (42 to 80 inches); pink (7.5YR 7/4) clay loam, brown (7.5YR 5/4), moist; few light gray (10YR 5/2) mottles in lower 2 inches of horizon; weak coarse subangular blocky structure; firm, hard, moderately sticky, moderately plastic; common fine roots; 15 percent fine and medium carbonate masses in matrix; strongly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 3 or 4
Chroma: 1 to 3
Texture: sandy clay loam
Calcium carbonate equivalent: 5 to 10 percent
Effervescence: very slight or slight
Reaction: slightly alkaline or moderately alkaline

Bt horizon

Hue: 7.5YR or 10YR
Value: 4 to 7
Chroma: 2 to 4
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 21 to 40 percent
Calcium carbonate equivalent: 8 to 20 percent
Effervescence: slight to violent
Reaction: slightly alkaline or moderately alkaline

Bk or Btk horizon (where present)

Hue: 7.5YR or 10YR
Value: 6 to 8
Chroma: 2 to 4
Texture: clay loam or sandy clay loam
Identifiable secondary calcium carbonate: amount—10 to 40 percent; size—medium; kind—masses and nodules; location—throughout
Calcium carbonate equivalent: 15 to 50 percent and decreases with depth
Effervescence: strong or violent

Pettus Series

The Pettus series consists of very deep, well drained soils that formed in calcareous loamy sediments of Pleistocene and Pliocene ages. These nearly level to moderately sloping soils are on shoulders on hillslopes. Slope ranges from 0 to 8 percent. Soils of the Pettus series are loamy-skeletal, carbonatic, hyperthermic Typic Calciustolls.

Typical pedon of Pettus loam in an area of Pettus loam, 2 to 5 percent slopes; from the intersection of Farm Road 884 and Farm Road 1726, 5 miles south on Farm Road 1726 to private road, 0.3 mile northeast and 0.1 mile southeast on private road, north in rangeland. Weesatche USGS topographic quadrangle; Latitude: 28 degrees, 45 minutes, 16.0 seconds North; Longitude: 97 degrees, 27 minutes, 51.9 seconds West; NAD 83.

A—0 to 27 centimeters (0 to 11 inches); dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky; slightly hard, very friable; common fine and medium roots; common fine tubular pores; about 5 percent by volume hard carbonate nodules from 2 to 80 millimeters (1/4 to 3 inches) in diameter; few snail shells; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk1—27 to 63 centimeters (11 to 25 inches); grayish brown (10YR 5/2) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky; hard, friable; common fine roots; few fine tubular pores; about 55 percent by volume hard carbonate nodules that are 2 to 80 millimeters (1/4 to 3 inches) across; 20 percent fine carbonate masses of films on peds; few snail shells; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk2—63 to 90 centimeters (25 to 35 inches); grayish brown (2.5Y 5/2) very gravelly loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky; hard, friable; few fine roots; few fine tubular pores; about 55 percent by volume hard carbonate nodules that are 2 to 8 millimeters (1/4 to 3 inches) across; 30 percent fine carbonate masses as films on peds; few snail shells; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk3—90 to 130 centimeters (35 to 51 inches); light gray (2.5Y 7/2) very gravelly loam, grayish brown (2.5Y 5/2) moist; weak medium subangular blocky; hard, friable; about 35 percent by volume hard carbonate nodules that are 2 to 80 millimeters (1/4 to 3 inches) across; 30 percent fine carbonate masses; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk4—130 to 203 centimeters (51 to 80 inches); light gray (2.5Y 7/2) very gravelly loam, light brownish gray (2.5Y 6/2) moist; weak medium subangular blocky; hard, friable; about 45 percent by volume hard carbonate nodules and angular fragments that are 2 to 80 millimeters (1/4 to 3 inches) across; 20 percent fine carbonate masses; strongly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 4 or 5
Chroma: 1 to 3
Texture: loam
Coarse fragments: 0 to 10 percent
Calcium carbonate equivalent: 30 to 55 percent
Effervescence: slight to violent

Bk horizon

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 2 or 3

Texture: gravelly loam, gravelly sandy clay loam, or very gravelly loam
Clay content: 22 to 38 percent
Silicate clay: 20 to 34 percent
Coarse fragments: amount—25 to 55 percent; kind—hard caliche
Calcium carbonate equivalent: amount—40 to 55 percent; size—2 to 20 millimeters
Identifiable secondary calcium carbonate: amount—5 to 20 percent; size—0.5 to 10 millimeters; kind—concretions
Effervescence: strong or violent

BCk horizon (where present)

Hue: 10YR or 2.5Y
Value: 6 to 8
Chroma: 1 to 4
Texture: loam or sandy clay or the gravelly, very gravelly, extremely gravelly, or cobbly counterparts
Coarse fragments: amount—15 to 80 percent; kind—strongly cemented fragments of caliche
Calcium carbonate equivalent: amount—40 to 70 percent; size—finer than 20 millimeters
Identifiable secondary calcium carbonate: amount—10 to 70 percent; size—0.5 to 10 millimeters; kind—weakly cemented or nodular concretions
Effervescence: strong or violent

Raisin Series

The Raisin series consists of very deep, well drained soils that formed in loamy alluvium of Quaternary age. These nearly level to gently sloping soils are on high stream terraces. Slope ranges from 1 to 5 percent. Soils of the Raisin series are fine-loamy, mixed, superactive, hyperthermic Typic Haplustalfs.

Typical pedon of Raisin loamy fine sand (fig. 37) in an area of Raisin loamy fine sand, 0 to 3 percent slopes; from the intersection of U.S. Highway 59 and FM 883 in Berclair, 1.57 miles northeast on U.S. Highway 59 to ranch road, 0.4 mile north and 0.4 mile west on ranch road, and 350 feet north in rangeland. Berclair USGS topographic quadrangle; Latitude: 28 degrees, 32 minutes, 43.80 seconds North; Longitude: 97 degrees, 34 minutes, 47.90 seconds West; NAD 83.

A—0 to 12 centimeters (0 to 5 inches); grayish brown (10YR 5/2) loamy fine sand, dark grayish brown (10YR 4/2), moist; single grain; loose, loose; common fine roots and many very fine roots; common fine interstitial and common medium interstitial pores; slightly acid; clear smooth boundary.

E—12 to 48 centimeters (5 to 19 inches); light brownish gray (10YR 6/2) loamy fine sand, dark grayish brown (10YR 4/2), moist; single grain; very friable, soft; many very fine roots; common fine tubular and common very fine tubular pores; 1 percent fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron with sharp boundaries lining pores; slightly acid; abrupt smooth boundary.

Bt1—48 to 64 centimeters (19 to 25 inches); dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2), moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; firm, hard; many very fine roots; common fine tubular and common very fine tubular pores; 5 percent prominent pale brown (10YR 6/3) sand coats on vertical faces of peds; 10 percent prominent black (10YR 2/1) organic stains on all faces of peds; 20 percent prominent very dark gray (10YR 3/1) clay films on all faces of peds; 2 percent fine distinct light brownish gray (10YR 6/2) iron depletions with sharp boundaries in matrix surrounding redox concentrations; 2 percent fine and medium prominent yellowish red (5YR 5/8) masses of oxidized iron with sharp boundaries in matrix;

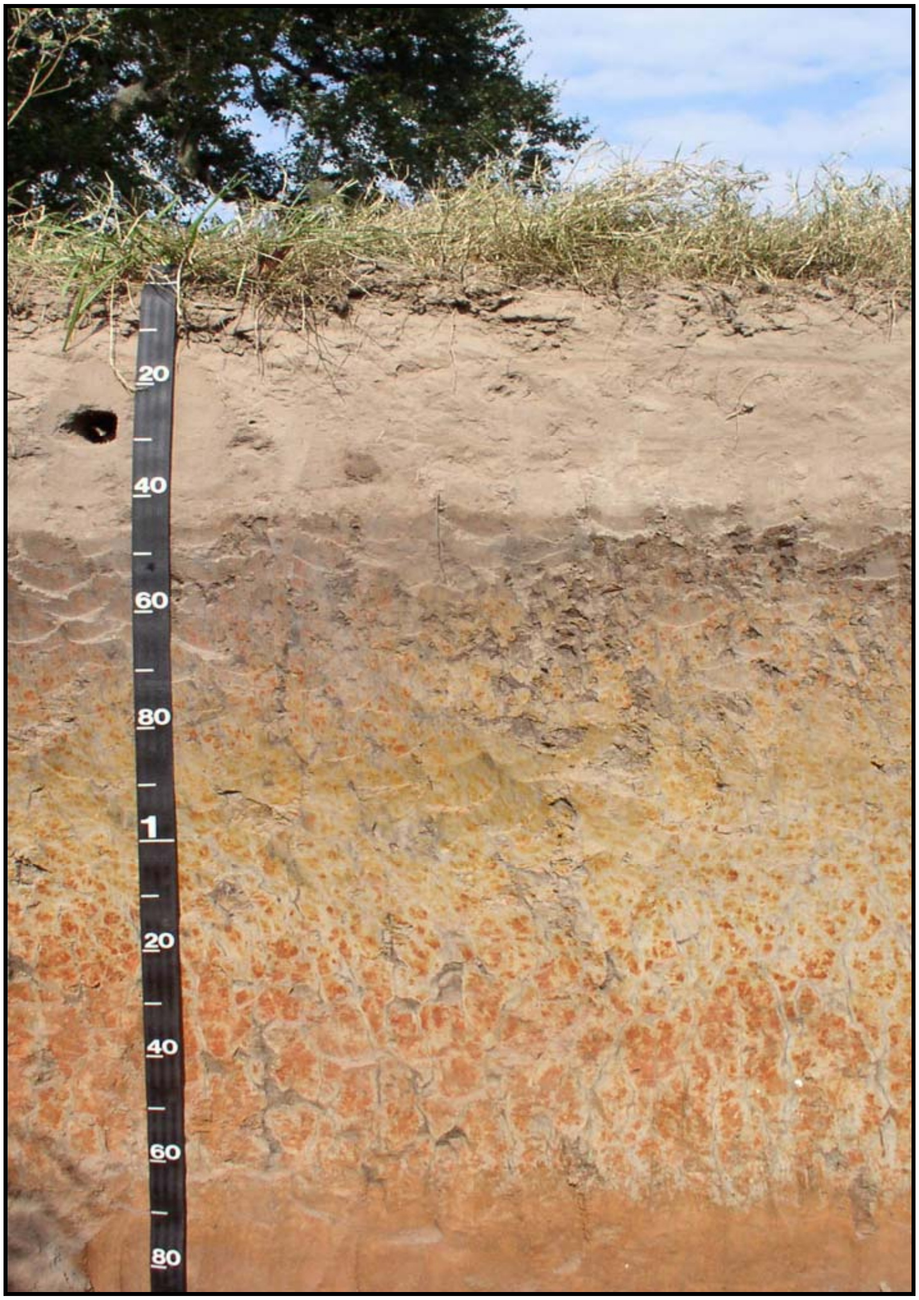

Figure 37.—Profile of Raisin loamy fine sand, 0 to 3 percent slopes. The mottled appearance from 50 centimeters to 170 centimeters (20 to 67 inches) is because of the reduction and oxidation of iron within the soil during extremely wet conditions. (Scale in centimeters and meters.)

4 percent fine and medium prominent brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; slightly acid; gradual wavy boundary.

Bt2—64 to 89 centimeters (25 to 35 inches); light gray (10YR 7/2) sandy clay loam, light brownish gray (10YR 6/2), moist; strong medium prismatic structure parting to strong medium angular blocky; firm, hard; common very fine roots; common very fine tubular pores; 5 percent prominent pale brown (10YR 6/3) sand coats on vertical faces of peds; 7 percent prominent very dark grayish brown (10YR 3/2) organic stains on all faces of peds; 25 percent prominent grayish brown (10YR 5/2) clay films on all faces of peds; 3 percent medium prominent yellowish red (5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 4 percent medium prominent strong brown (7.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; 5 percent medium and coarse prominent brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; slightly acid; gradual wavy boundary.

Bt3—89 to 117 centimeters (35 to 46 inches); light gray (10YR 7/2) sandy clay loam, light brownish gray (10YR 6/2), moist; strong medium prismatic structure parting to strong medium angular blocky; firm, hard; common very fine roots between peds; common very fine tubular pores; 3 percent prominent pale brown (10YR 6/3) sand coats on vertical faces of peds; 10 percent prominent very dark grayish brown (10YR 3/2) organic stains on all faces of peds; 30 percent prominent light brownish gray (10YR 6/2) clay films on all faces of peds; 5 percent medium prominent red (2.5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; 8 percent medium and coarse prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; slightly acid; gradual wavy boundary.

Bt4—117 to 138 centimeters (46 to 54 inches); 50 percent pale brown (10YR 6/3) and 40 percent yellowish red (5YR 5/6) sandy clay loam, 50 percent light brownish gray (10YR 6/2) and 40 percent yellowish red (5YR 5/6), moist; strong medium prismatic structure parting to moderate medium and coarse angular blocky; firm, hard; common very fine roots between peds; common very fine tubular pores; 3 percent prominent dark grayish brown (10YR 4/2) organic stains on all faces of peds and 5 percent prominent pale brown (10YR 6/3) sand coats on vertical faces of peds; 25 percent prominent light brownish gray (10YR 6/2) clay films on all faces of peds; 3 percent fine and medium prominent red (2.5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; neutral; gradual wavy boundary.

Bt5—138 to 171 centimeters (54 to 67 inches); yellowish red (5YR 5/6) sandy clay loam, strong brown (7.5YR 5/6), moist; moderate coarse prismatic structure parting to moderate coarse angular blocky; firm, slightly hard; common very fine roots between peds; common very fine tubular pores; 3 percent prominent dark grayish brown (10YR 4/2) organic stains on all faces of peds; 5 percent prominent pale brown (10YR 6/3) sand coats on vertical faces of peds; 20 percent prominent brown (7.5YR 5/3) clay films on all faces of peds; neutral; clear smooth boundary.

Btk—171 to 203 centimeters (67 to 80 inches); brown (7.5YR 5/4) loam, brown (7.5YR 4/4), moist; weak coarse subangular blocky structure; friable, slightly hard; common very fine roots between peds; few very fine tubular pores; 2 percent distinct dark grayish brown (10YR 4/2) organic stains on vertical faces of peds; 10 percent distinct brown (7.5YR 4/4) clay films on vertical faces of peds; 8 percent fine and medium carbonate nodules; 12 percent medium and coarse carbonate masses; moderately alkaline.

A horizon

Hue: 10YR
Value: 4 or 5
Chroma: 2 or 3
Texture: fine sandy loam or loamy fine sand
Clay content: 3 to 12 percent
Reaction: moderately acid to neutral

E horizon (where present)

Hue: 10YR
Value: 5 to 7

Chroma: 2 or 3
Texture: loamy fine sand or loamy sand
Clay content: 3 to 12 percent
Reaction: moderately acid to neutral

Upper Bt horizon

Hue: 10YR
Value: 4 to 7
Chroma: 2
Texture: sandy clay loam or sandy clay
Clay content: 30 to 38 percent
Iron concentrations: amount—2 to 5 percent; size—fine; shades—brown or red
Iron depletions: amount—0 to 2 percent; size—fine or medium; shades—gray
Reaction: moderately acid to neutral

Lower Bt horizon

Hue: 5YR to 10YR
Value: 4 to 6
Chroma: 4 to 6
Texture: sandy clay loam
Clay content: 22 to 30 percent
Iron concentrations: amount—2 to 15 percent; size—fine; shades—yellow, brown, or red
Iron depletions: amount—0 to 2 percent; size—fine or medium; shades—gray
Reaction: slightly acid to slightly alkaline

Btk horizon (where present)

Hue: 5YR to 10YR
Value: 4 to 6
Chroma: 4 to 6
Texture: fine sandy loam, loam, or sandy clay loam
Clay content: 18 to 28 percent
Iron concentrations: amount—2 to 15 percent; size—fine; shades—yellow, brown, or red
Iron depletions: amount—0 to 2 percent; size—fine or medium; shades—gray
Calcium carbonate equivalent: 5 to 45 percent
Identifiable secondary calcium carbonate: amount—0 to 15 percent; kind—masses or nodules
Effervescence: none to slight
Reaction: slightly alkaline or moderately alkaline

Realitos Series

The Realitos series consists of very deep, somewhat poorly drained, very slowly permeable soils. These nearly level soils are in upland depressions and formed in clayey over loamy alluvium derived from the Goliad Formation. Slope is 0 to 1 percent. Soils of the Realitos series are fine, smectitic, hyperthermic Typic Haplusterts.

Typical pedon of Realitos clay in an area of Realitos clay, 0 to 1 percent slopes; from the intersection of U.S. Highway 59 and Bowers Street in Berclair, about 0.25 mile south on Bowers Street to Lucas Road, 3.2 miles east on Lucas Road to Power Road, 2.8 miles south on Power Road to private road, 1.2 miles west on private road, 1.4 miles south on private road, 0.2 mile southwest on road, and 50 feet south in depression. Skidmore NE USGS topographic quadrangle; Latitude: 28 degrees, 24 minutes, 50.00 seconds North; Longitude: 97 degrees, 32 minutes, 25.50 seconds West; NAD 83.

A—0 to 15 centimeters (0 to 6 inches); dark gray (2.5Y 4/1) clay, very dark gray (2.5Y 3/1), moist; moderate fine and medium granular structure; very hard, very firm; 1 percent fine prominent yellowish brown (10YR 5/6) masses of oxidized iron with clear boundaries lining pores; 1 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries lining pores; neutral; clear wavy boundary.

Bss1—15 to 58 centimeters (6 to 23 inches); dark gray (2.5Y 4/1) clay, very dark gray (2.5Y 3/1), moist; strong medium and coarse angular blocky structure; very hard, very firm; 1 percent faint slickensides (pedogenic); 3 percent fine prominent dark yellowish brown (10YR 4/6) masses of oxidized iron with sharp boundaries; neutral; clear wavy boundary.

Bss2—58 to 76 centimeters (23 to 30 inches); dark gray (10YR 4/1) clay, very dark gray (10YR 3/1), moist; moderate medium angular blocky structure; very hard, firm; 3 percent faint slickensides (pedogenic); 2 percent fine prominent dark yellowish brown (10YR 4/6) masses of oxidized iron with sharp boundaries lining pores; 1 percent fine distinct dark yellowish brown (10YR 4/4) masses of oxidized iron with sharp boundaries lining pores; slightly alkaline; clear wavy boundary.

Bkss—76 to 112 centimeters (30 to 44 inches); gray (10YR 5/1) clay loam, dark gray (10YR 4/1), moist; moderate medium subangular blocky structure; very hard, firm; 3 percent faint slickensides (pedogenic); 3 percent fine distinct dark yellowish brown (10YR 4/4) masses of oxidized iron with sharp boundaries lining pores; 1 percent fine and medium carbonate concretions; moderately alkaline; clear wavy boundary.

BCk—112 to 203 centimeters (44 to 80 inches); light brownish gray (10YR 6/2) clay loam, light brownish gray (2.5Y 6/2), moist; 34 percent clay; moderate fine and medium subangular blocky structure; hard, firm; 5 percent medium prominent olive yellow (2.5Y 6/6), moist, masses of oxidized iron; 1 percent fine and medium carbonate concretions; moderately alkaline.

A horizon

Hue: 10YR or 2.5Y
Value: 2 to 4
Chroma: 1
Texture: clay
Clay content: 40 to 45 percent
Redox concentrations: amount—0 to 5 percent; shades—brown
Coarse fragments: amount—0 to 2 percent; size—gravel
Base saturation: 90 to 100 percent
EC (dS/m): 0 to 2
Gypsum: 0 to 2 percent
SAR: 0 to 4
Effervescence: none or slight
Reaction: slightly acid to slightly alkaline

Bss or Bw horizon (where present)

Hue: 10YR or 2.5Y
Value: 3 to 6
Chroma: 1 to 3
Texture: clay
Redox concentrations: amount—0 to 5 percent; shades—brown or yellow
Clay content: 40 to 60 percent
Coarse fragments: amount—0 to 5 percent; size—gravel
Base saturation: 95 to 100 percent
Calcium carbonate equivalent: 2 to 10 percent
EC (dS/m): 0 to 2

Gypsum: 0 to 6 percent
SAR: 0 to 6
Effervescence: none or slight
Reaction: neutral to moderately alkaline

Bkss horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 to 3
Texture: clay loam or clay
Redox concentrations: amount—0 to 5 percent; shades—brown or yellow
Clay content: 35 to 60 percent
Coarse fragments: amount—0 to 5 percent; size—gravel
Base saturation: 100 percent
Calcium carbonate equivalent: 15 to 35 percent
Visible calcium carbonate: amount—5 to 10 percent; size—fine; kind—thread-shaped masses; location—throughout
EC (dS/m): 2 to 8
Gypsum: 2 to 6 percent
SAR: 2 to 10
Effervescence: none or slight
Reaction: slightly alkaline or moderately alkaline

BCk horizon (where present)

Hue: 10YR
Value: 4 to 6
Chroma: 1 to 3
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 30 to 38 percent
Redox concentrations: amount—0 to 5 percent; shades—brown or yellow
Coarse fragments: amount—0 to 5 percent; size—gravel
Base saturation: 100 percent
Calcium carbonate equivalent: 0 to 18 percent
Visible calcium carbonate: amount—0 to 10 percent; size—fine; kind—thread-shaped masses; location—throughout
EC (dS/m): 2 to 8
Gypsum: 2 to 6 percent
SAR: 2 to 10
Effervescence: none or slight
Reaction: slightly alkaline or moderately alkaline

Rhymes Series

The Rhymes series consists of very deep, excessively drained, sandy soils that formed in loamy sediments overlain by recent windblown sands. These nearly level to gently sloping soils are on stream terraces. Slope ranges from 0 to 5 percent. Soils of the Rhymes series are loamy, siliceous, active, hyperthermic Grossarenic Paleustalfs.

Typical pedon of Rhymes fine sand in an area of Rhymes fine sand, 1 to 5 percent; from the intersection of Farm Road 2043 and Texas Highway 239, 2.1 miles south on Farm Road 2043 to private road, 0.3 mile north on private road, 0.5 mile east along fenceline, and 500 feet northeast in rangeland. Charco USGS topographic quadrangle; Latitude: 28 degrees, 41 minutes, 39.4 seconds North; Longitude: 97 degrees, 31 minutes, 31.2 seconds West; NAD 83.

A—0 to 12 centimeters (0 to 5 inches); pale brown (10YR 6/3) dry, fine sand, brown (10YR 5/3) moist; single grain structure; loose, loose; many fine roots; many medium interstitial pores; slightly acid; clear smooth boundary.

E1—12 to 66 centimeters (5 to 26 inches); very pale brown (10YR 7/3) dry, fine sand, pale brown (10YR 6/3) moist; single grain structure; loose, loose; common very fine roots; common fine roots; many medium interstitial pores; slightly acid; clear smooth boundary.

E2—66 to 132 centimeters (26 to 52 inches); very pale brown (10YR 8/3) dry, fine sand, pale brown (10YR 6/3) moist; single grain structure; loose, loose; common very fine roots; common fine roots; common fine interstitial pores; slightly acid; abrupt smooth boundary.

Bt1—132 to 168 centimeters (52 to 66 inches); light brownish gray (10YR 6/2) dry, fine sandy loam, grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; slightly hard, friable; common very fine roots; common very fine tubular pores; 10 percent distinct grayish brown (10YR 5/2) clay films on all faces of peds; 8 percent medium prominent reddish yellow (7.5YR 6/8) masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; 5 percent coarse prominent red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; slightly acid; clear smooth boundary.

Bt2—168 to 203 centimeters (66 to 80 inches); very pale brown (10YR 7/3) dry, sandy clay loam, pale brown (10YR 6/3) moist; weak coarse subangular blocky structure; hard, firm; 15 percent distinct pale brown (10YR 6/3) clay films on all faces of peds; 10 percent coarse prominent brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix; 20 percent coarse prominent red (2.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; slightly acid.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: fine sand
Reaction: moderately acid to neutral

E horizon

Hue: 7.5YR or 10YR
Value: 6 to 8
Chroma: 2 to 6
Texture: fine sand, loamy sand, or loamy fine sand
Redox concentrations: amount—none to common; size—fine or medium; contrast—faint or distinct; shades—brown or yellow
Reaction: moderately acid to neutral

Bt horizon

Hue: 7.5YR or 10YR
Value: 5 to 7
Chroma: 2 to 6
Texture: fine sandy loam or sandy clay loam
Clay content: 18 to 35 percent
Redox concentrations: amount—few to common; size—fine or medium; contrast—faint to prominent; shades—red, brown, or yellow
Redox depletions: amount—few; size—fine; contrast—prominent or distinct; shades—gray; location—in soil matrix
Reaction: moderately acid to slightly alkaline

BC or BCk horizon (where present)

Hue: 7.5YR or 10YR
Value: 5 to 8
Chroma: 2 to 6
Texture: fine sandy loam or sandy clay loam
Clay content: 15 to 30 percent
Identifiable secondary calcium carbonate: amount—0 to 4 percent; size—fine or medium; kind—concretions and masses
Reaction: moderately acid to moderately alkaline

Runge Series

The Runge series consists of very deep, well drained soils that formed in loamy materials derived from sandstone of Pliocene to Pleistocene age. These nearly level to gently sloping soils are on hillslopes. Slope ranges from 1 to 3 percent. Soils of the Runge series are fine-loamy, mixed, superactive, hyperthermic Typic Argiustolls.

Typical pedon of Runge fine sandy loam (fig. 38) in an area of Runge fine sandy loam, 1 to 3 percent slopes; from the intersection of Farm Road 1726 and Farm Road 884, 2 miles southwest on Farm Road 1726 to road, 0.3 mile northwest on road, and 600 feet west in pastureland. Runge SE USGS topographic quadrangle; Latitude: 28 degrees, 47 minutes, 51.20 seconds North; Longitude: 97 degrees, 33 minutes, 21.10 seconds West; NAD 83.

A—0 to 36 centimeters (0 to 14 inches); very dark grayish brown (10YR 3/2) fine sandy loam, very dark brown (10YR 2/2), moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky structure; friable; soft; neutral; clear smooth boundary.

Bt1—36 to 66 centimeters (14 to 26 inches); brown (7.5YR 5/3) sandy clay loam, brown (7.5YR 4/3), moist; moderate medium subangular blocky structure; hard, firm; 10 percent discontinuous distinct clay films on vertical faces of peds; neutral; clear smooth boundary.

Bt2—66 to 130 centimeters (26 to 51 inches); yellowish red (5YR 4/6) sandy clay loam, yellowish red (5YR 4/6), moist; 57 percent sand; moderate medium prismatic structure parting to moderate medium angular blocky; hard, very firm; 30 percent discontinuous prominent clay films on vertical faces of peds; 1 percent very fine threadlike carbonate masses; slightly alkaline; smooth boundary.

Bk1—130 to 165 centimeters (51 to 65 inches); yellowish red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6), moist; weak medium subangular blocky structure parting to weak fine subangular blocky; hard, firm; 3 percent distinct organic stains; 1 percent fine threadlike carbonate masses; 5 percent fine and medium carbonate nodules; very slightly effervescent; moderately alkaline; abrupt smooth boundary.

Bk2—165 to 203 centimeters (65 to 80 inches); reddish yellow (7.5YR 7/6) loam, reddish yellow (7.5YR 6/6), moist; weak fine subangular blocky structure; hard, friable; 5 percent fine and medium carbonate concretions; 10 percent fine and medium carbonate masses; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5
Chroma: 2 or 3
Texture: fine sandy loam
Reaction: moderately acid to neutral

Figure 38.—Profile of Runge fine sandy loam, 1 to 3 percent slopes. White masses are secondary carbonates that typically occur below a depth of 100 centimeters (40 inches). (Scale in centimeters and feet.)

Bt horizon

Hue: 5YR to 10YR
Value: 4 to 7
Chroma: 3 to 6
Texture: sandy clay loam or clay loam
Reaction: slightly acid or neutral

Btk horizon (where present)

Hue: 5YR to 10YR
Value: 4 to 8
Chroma: 3 to 6
Texture: very fine sandy loam, loam, or sandy clay loam
Identifiable secondary calcium carbonate: amount—1 to 10 percent; kind—threads, films, masses, and nodules
Effervescence: slight or strong
Reaction: slightly alkaline or moderately alkaline

Bk horizon

Hue: 5YR to 10YR
Value: 5 to 8
Chroma: 3 to 6
Texture: fine sandy loam, loam, or sandy clay loam
Identifiable secondary calcium carbonate: amount—5 to 15 percent; kind—threads, films, masses, and nodules
Effervescence: slight to violent

Rydolph Series

The Rydolph series consists of deep, somewhat poorly drained soils that formed in clayey and loamy alluvium of Holocene age. These nearly level soils are on flood plains of major streams in the Coast Prairie. Slope is 0 to 1 percent. Soils of the Rydolph series are fine-silty, mixed, active, calcareous, hyperthermic Aeric Fluvaquents.

Typical pedon of Rydolph silty clay in an area of Rydolph silty clay, 0 to 1 percent slopes, frequently flooded; from the intersection of Loop 175 and U.S. Highway 77 southwest of Victoria, 11.3 miles south on U.S. Highway 77 to Farm Road 445, 2.5 miles east on Farm Road 445, 1.2 miles south, 1.3 miles east, and 50 feet north in rangeland. Bloomington SW USGS topographic quadrangle; Latitude: 28 degrees, 31 minutes, 31.25 seconds North; Longitude: 96 degrees, 58 minutes, 57.7 seconds West; NAD 83.

A—0 to 23 centimeters (0 to 9 inches); dark grayish brown (10YR 4/2) silty clay, light brownish gray (10YR 6/2) dry; moderate medium and fine subangular blocky structure; very hard, very firm, sticky and plastic; many fine and medium roots in upper part, and common very fine and fine roots in lower part; few fine pores; few shell fragments less than 10 millimeters across; slightly effervescent; moderately alkaline; gradual smooth boundary.

C1—23 to 81 centimeters (9 to 32 inches); grayish brown (10YR 5/2) loam, light gray (10YR 7/2) dry; massive; hard, friable, slightly sticky and slightly plastic; many discontinuous strata 2 to 5 millimeters thick of gray very fine sand and silt; common very fine and fine roots; few shell fragments less than 10 millimeters across; common fine distinct yellowish brown (10YR 5/6) masses of oxidized iron; slightly effervescent; moderately alkaline; clear smooth boundary.

C2—81 to 122 centimeters (32 to 48 inches); grayish brown (10YR 5/2) silty clay loam, light gray (10YR 7/2) dry; massive; very hard, firm, sticky and plastic; few discontinuous strata 2 to 10 millimeters thick of brown very fine sand and silt;

common very fine and fine roots; few shell fragments less than 10 millimeters across; slightly effervescent; moderately alkaline; clear smooth boundary.

C3—122 to 150 centimeters (48 to 59 inches); brown (10YR 5/3) silt loam, very pale brown (10YR 7/3) dry; massive; hard, friable, slightly sticky and slightly plastic; few discontinuous strata 2 to 10 millimeters thick of gray very fine sand and silt; few fine roots; few fine pores; few shell fragments less than 10 millimeters across; common fine distinct yellowish brown (10YR 5/6) and few fine prominent dark reddish brown masses of oxidized iron; slightly effervescent; moderately alkaline; clear smooth boundary.

C4—122 to 180 centimeters (59 to 71 inches); grayish brown (10YR 5/2) silty clay loam, light gray (10YR 7/2) dry; massive; very hard, firm, sticky and plastic; few discontinuous strata 2 to 10 millimeters thick of gray silty clay loam; few fine roots; common medium pores; common shell fragments less than 10 millimeters across; many fine distinct yellowish brown (10YR 5/6) masses of oxidized iron; slightly effervescent; moderately alkaline; clear smooth boundary.

C5—180 to 203 centimeters (71 to 80 inches); gray (10YR 5/1) loam, light gray (10YR 7/1) dry; massive; hard, friable, slightly sticky and plastic; few fine pores; few shell fragments less than 10 millimeters across; slightly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 to 3
Texture: silty clay
Clay content: 40 to 50 percent
Redox concentrations: amount—0 to 2 percent; shades—brown or yellow
Redox depletions: amount—0 to 2 percent; shades—gray

Upper C horizon (60 percent or more of upper C horizons)

Hue: 10YR
Value: 4 or 5
Chroma: 2
Texture: silty clay loam, silt loam, or loam
Clay content: 20 to 40 percent
Redox concentrations: amount—1 to 20 percent; shades—brown or yellow
Redox depletions: amount—1 to 10 percent; shades—gray

Lower C horizon

Hue: 10YR
Value: 4 to 7
Chroma: 1 to 3
Texture: silty clay loam, silt loam, or loam
Clay content: 20 to 40 percent
Redox concentrations: amount—0 to 20 percent; shades—brown or yellow
Redox depletions: amount—0 to 10 percent; shades—gray

Sarco Series

The Sarco series consists of very deep, moderately well drained, slowly permeable soils that formed in loamy sediments derived from alluvium of late-Pleistocene age. These nearly level or very gently sloping soils are on high terraces of streams on the coastal plain. Slope ranges from 0 to 2 percent. Soils of the Sarco series are fine-loamy, mixed, active, hyperthermic Oxyaquic Haplustalfs.

Typical pedon of Sarco coarse sand (fig. 39) in an area of Sarco coarse sand, 0 to 2 percent slopes; from the intersection of Farm Road 2441 and U.S. Highway 183 south of Goliad, 8.2 miles west and south on Farm Road 2441 to Prescott Road, 3.5 miles southwest on Prescott Road, 0.6 mile southeast on right-of-way, 1.4 miles southwest on ranch road along fence, 0.5 mile southeast on ranch road to fence, 0.7 mile southwest along fence to cross fence, 0.2 mile northwest along cross fence, and 120 feet east in rangeland. Blanconia USGS topographic quadrangle; Latitude: 28 degrees, 27 minutes, 40.29 seconds North; Longitude: 97 degrees, 27 minutes, 51.58 seconds West; NAD 83.

A—0 to 12 centimeters (0 to 5 inches); grayish brown (10YR 5/2) coarse sand, dark grayish brown (10YR 4/2), moist; weak fine granular structure; loose, soft; common fine roots and common medium roots and many very fine roots; many medium interstitial pores; slightly acid; clear smooth boundary.

E—12 to 30 centimeters (5 to 12 inches); very pale brown (10YR 7/3) coarse sand, yellowish brown (10YR 5/4), moist; single grain; loose, soft; many very fine roots; common fine tubular and common very fine tubular pores; 8 percent fine prominent reddish yellow (7.5YR 6/8) masses of oxidized iron with clear boundaries in matrix; slightly acid; abrupt smooth boundary.

Bt1—30 to 50 centimeters (12 to 20 inches); light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2), moist; moderate medium prismatic parting to medium subangular blocky structure; firm, hard; common very fine roots; common fine tubular and common very fine tubular pores; 5 percent distinct yellowish brown (10YR 5/4) sand coats on vertical faces of peds; 15 percent distinct grayish brown (10YR 5/2) clay films on all faces of peds; 8 percent coarse prominent brownish yellow (10YR 6/8) masses of oxidized iron with clear boundaries in matrix surrounding redox concentrations; 10 percent medium prominent red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; 14 percent medium prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; strongly acid; gradual wavy boundary.

Bt2—50 to 65 centimeters (20 to 26 inches); light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2), moist; very firm, very hard; common fine roots and common very fine roots; common very fine tubular pores; 5 percent yellowish brown (10YR 5/4) sand coats on vertical faces of peds; 30 percent distinct grayish brown (10YR 5/2) clay films on all faces of peds; 6 percent medium prominent red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; 8 percent coarse prominent brownish yellow (10YR 6/8) masses of oxidized iron with clear boundaries in matrix surrounding redox concentrations; 16 percent medium prominent strong brown (7.5YR 5/6), moist, masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; strongly acid; gradual wavy boundary.

Bt3—65 to 82 centimeters (26 to 32 inches); light brownish gray (2.5Y 6/2) sandy clay loam, grayish brown (2.5Y 5/2), moist; very firm, very hard; common very fine roots; common very fine tubular pores; 30 percent prominent yellowish brown (10YR 5/4) clay films on all faces of peds; 2 percent medium prominent red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; 4 percent coarse prominent brownish yellow (10YR 6/8) masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; 10 percent coarse prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; slightly acid; gradual wavy boundary.

Btk1—82 to 110 centimeters (32 to 43 inches); light gray (2.5Y 7/2) sandy clay loam, light brownish gray (2.5Y 6/2), moist; very firm, hard; common very fine roots; few very fine tubular pores; 20 percent prominent yellowish brown (10YR 5/4) clay films on all faces of peds; 2 percent medium prominent red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; 2 percent coarse prominent masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; 6 percent coarse prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; 6 percent fine white (10YR 8/1) carbonate masses; 1 percent fine very pale brown (10YR 8/2) carbonate nodules; moderately alkaline; gradual wavy boundary.

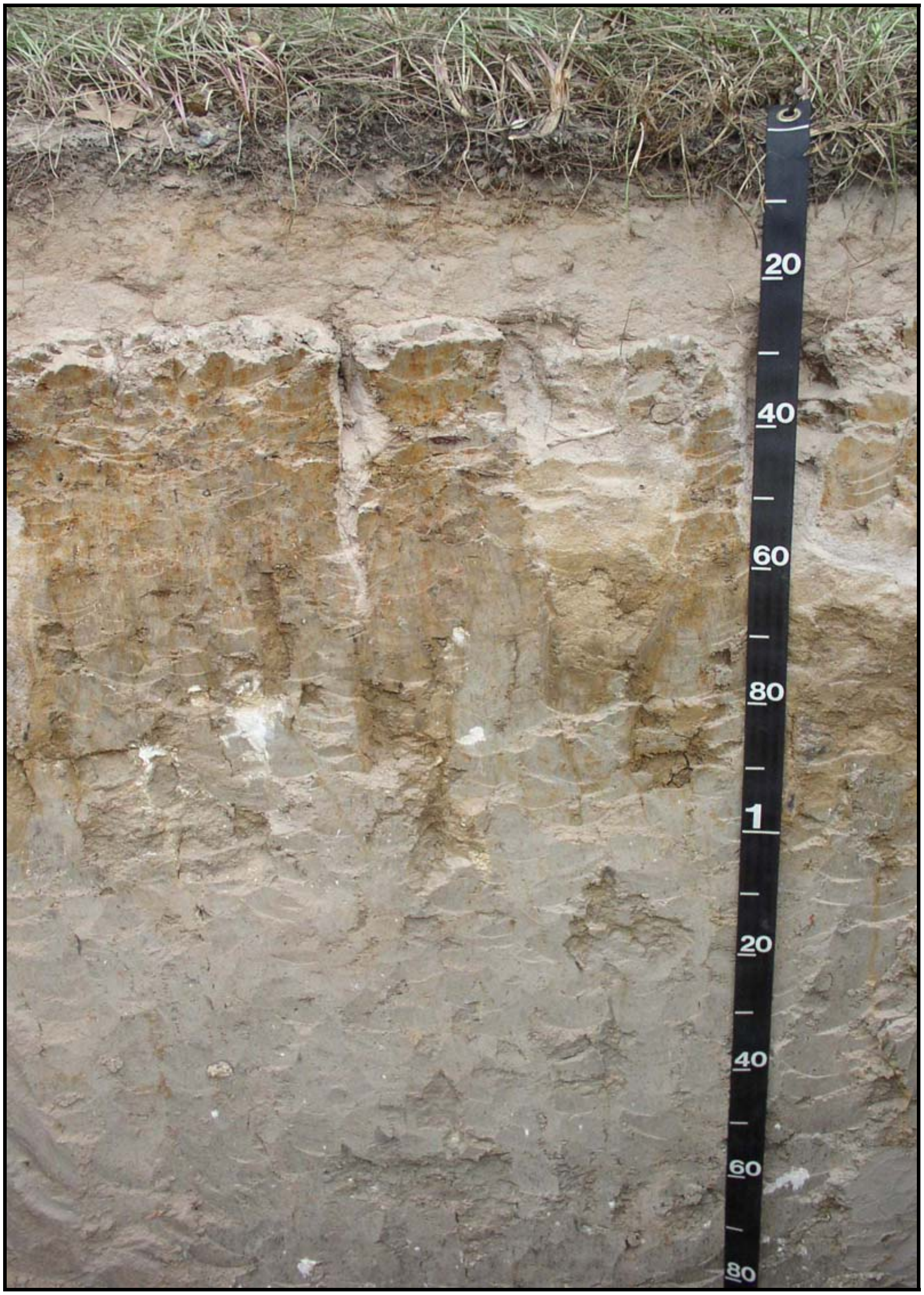

Figure 39.—Profile of Sarco coarse sand, 0 to 2 percent slopes. The sandy surface is typically less than 50 centimeters (20 inches) thick and rests abruptly over sandy clay loam subsoil. (Scale in centimeters and meters.)

Btk2—110 to 137 centimeters (43 to 54 inches); light gray (2.5Y 7/1) sandy clay loam, gray (2.5Y 6/1), moist; firm, hard; common fine roots and common very fine roots; few very fine tubular pores; 10 percent distinct light olive (10Y 5/4) clay films on all faces of peds; 10 percent distinct gray (2.5Y 6/1) clay films on all faces of peds; 2 percent coarse prominent red (2.5YR 4/8) masses of oxidized iron with sharp boundaries in matrix; 2 percent very coarse prominent brownish yellow (10YR 6/8) masses of oxidized iron with clear boundaries in matrix and 6 percent coarse prominent masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; 2 percent medium carbonate masses; moderately alkaline; gradual wavy boundary.

Btk3—137 to 166 centimeters (54 to 65 inches); white (2.5Y 8/1) sandy clay loam, light gray (2.5Y 7/1), moist; firm, hard; common very fine roots; 25 percent distinct gray (2.5Y 6/1) clay films on all faces of peds; 2 percent medium prominent red (2.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 6 percent fine prominent black (10YR 2/1) iron-manganese masses with sharp boundaries in matrix; 6 percent coarse prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix surrounding redox concentrations; 2 percent fine white (10YR 8/1) carbonate masses; moderately alkaline; gradual wavy boundary.

Btk4—166 to 203 centimeters (65 to 80 inches); white (2.5Y 8/1) sandy clay loam, light gray (2.5Y 7/1), moist; firm, hard; common fine roots and common very fine roots; 25 percent distinct gray (2.5Y 6/1) clay films on all faces of peds; 2 percent medium prominent strong brown (7.5YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 10 percent fine prominent black (10YR 2/1) iron-manganese masses with sharp boundaries in matrix; 4 percent coarse white (10YR 8/1) carbonate masses; moderately alkaline.

A horizon

Hue: 10YR
Value: 5 to 7
Chroma: 2 to 4
Texture: coarse sand or sand
Clay content: 2 to 10 percent
Redox concentrations: where present; amount—1 percent; shades—brown
Reaction: moderately acid to neutral

E horizon (where present)

Hue: 10YR
Value: 5 to 7
Chroma: 3 or 4
Texture: coarse sand or sand
Clay content: 1 to 10 percent
Redox concentrations: amount—1 to 5 percent; shades—brown
Reaction: moderately acid to neutral

Upper Bt horizon

Hue: 10YR
Value: 4 to 7
Chroma: 1 to 2
Texture: sandy clay loam or sandy clay
Clay content: 30 to 45 percent
Redox concentrations: amount—1 to 30 percent; shades—red, brown, or yellow
Reaction: strongly acid to neutral

Lower Bt horizon

Hue: 10YR or 2.5Y
Value: 4 to 8
Chroma: 1 to 4
Texture: sandy loam or sandy clay loam
Clay content: 15 to 30 percent
Redox concentrations: amount—0 to 20 percent; shades—red, brown, yellow, gray, and black
Reaction: strongly acid to neutral

Btk horizon (where present)

Hue: 10YR or 2.5Y
Value: 6 to 8
Chroma: 1 to 4
Texture: sandy loam or sandy clay loam
Clay content: 15 to 30 percent
Redox concentrations: amount—0 to 25 percent; shades—red, brown, yellow, and black
Effervescence: none to strong
Reaction: neutral to moderately alkaline

Sarnosa Series

The Sarnosa series consists of very deep, well drained, soils that formed in calcareous sandstone and loamy soil materials mainly of the Oakville sandstone and sandstone members of the Goliad Formation. These nearly level to moderately sloping soils are on hillslopes. Slope ranges from 1 to 8 percent. Soils of the Sarnosa series are coarse-loamy, mixed, superactive, hyperthermic Typic Calciustolls.

Typical pedon of Sarnosa fine sandy loam in an area of Sarnosa fine sandy loam, 1 to 5 percent slopes; from the intersection of Texas Highway 239 and Farm Road 2043 west of Goliad, 0.3 mile south on Farm Road 2043 to private road, 0.6 mile east and west on private road, 0.2 mile south along fenceline, and 100 feet west in pastureland. Goliad USGS topographic quadrangle; Latitude: 28 degrees, 39 minutes, 29.00 seconds North; Longitude: 97 degrees, 27 minutes, 51.00 seconds West; NAD 83.

A—0 to 28 centimeters (0 to 11 inches); dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2), moist; moderate fine and medium granular structure; soft, friable; many very fine and fine roots; many fine interstitial pores; 3 percent shell fragments; 15 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; clear smooth boundary.

Bw1—28 to 69 centimeters (11 to 27 inches); grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2), moist; weak fine and medium subangular blocky structure; soft, very friable; common very fine and fine roots; common very fine and fine tubular pores; 1 percent fine threadlike carbonate masses; 3 percent shell fragments; 16 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear smooth boundary.

Bw2—69 to 94 centimeters (27 to 37 inches); brown (10YR 5/3) fine sandy loam, brown (10YR 4/3), moist; weak medium subangular blocky structure; soft, very friable; common very fine roots; common very fine tubular pores; 2 percent fine threadlike carbonate masses; 5 percent shell fragments; 17 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bk1—94 to 150 centimeters (37 to 59 inches); pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3), moist; weak coarse subangular blocky structure; friable;

common very fine roots; common very fine tubular pores; 2 percent fine spherical carbonate masses and 1 percent fine threadlike carbonate masses; 1 percent shell fragments; violently effervescent; moderately alkaline; gradual smooth boundary.

Bk2—150 to 203 centimeters (59 to 80 inches); very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3), moist; weak coarse subangular blocky structure; friable; few very fine roots; common very fine tubular pores; 2 percent fine threadlike carbonate masses and 1 percent fine spherical carbonate masses; 1 percent shell fragments; 25 percent calcium carbonate equivalent; violently effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 3 to 5
Chroma: 1 or 2
Texture: fine sandy loam
Effervescence: strong or violent
Reaction: slightly alkaline or moderately alkaline

Bw horizon (where present)

Hue: 7.5YR or 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: fine sandy loam, loam, or sandy clay loam
Clay content: 8 to 22 percent
Carbonate clay content: 0 to 5 percent
Identifiable secondary calcium carbonate: amount—none to few; kind—threads, masses, films, or nodules
Effervescence: strong or violent
Reaction: slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 5 to 8
Chroma: 2 to 4
Texture: fine sandy loam, loam, or sandy clay loam
Clay content: 8 to 18 percent
Carbonate clay content: 2 to 7 percent
Identifiable secondary calcium carbonate: amount—few to common; kind—threads, masses, films, or nodules
Effervescence: strong or violent
Reaction: slightly alkaline or moderately alkaline

Schattel Series

The Schattel series consists of deep shale that has clay texture, well drained soils that formed in clayey residuum of Quaternary age. These gently sloping to moderately sloping soils are on hillslopes. Slope ranges from 1 to 8 percent. Soils of the Schattel series are fine, smectitic, hyperthermic Vertic Calciustepts.

Typical pedon of Schattel sandy clay loam in an area of Schattel sandy clay loam, 1 to 5 percent slopes; from the intersection of Riverdale Road and Farm Road 2043, 0.25 mile southwest on Riverdale Road to Irby Road, 0.7 mile west on Irby road to private road, 0.4 mile north on private road to field fence, west along field fence and 150 feet northwest in cropland. Charco USGS topographic quadrangle; Latitude: 28 degrees, 42 minutes, 11.76 seconds North; Longitude: 97 degrees, 33 minutes, 42.68 seconds West; NAD 83.

Ap—0 to 32 centimeters (0 to 13 inches); grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2), moist; weak fine subangular blocky structure; slightly hard, friable; 1 percent fine carbonate nodules; strongly effervescent; moderately alkaline; clear wavy.

Bk1—32 to 47 centimeters (13 to 19 inches); light yellowish brown (2.5Y 6/4) clay, light olive brown (2.5Y 5/4), moist; 1 percent fine distinct yellow (2.5Y 7/8) mottles; weak medium subangular blocky structure; hard, firm; 10 percent dark grayish brown (10YR 4/2) infilled cracks; 2 percent fine carbonate nodules; 2 percent fine carbonate masses; strongly effervescent; moderately alkaline; gradual wavy.

Bk2—47 to 63 centimeters (19 to 25 inches); light yellowish brown (2.5Y 6/4) clay, light yellowish brown (2.5Y 6/4), moist; weak coarse subangular blocky structure; very hard, very firm; 5 percent dark grayish brown (10YR4/2) infilled cracks; 1 percent fine carbonate nodules; 1 percent fine carbonate masses; 1 percent fine gypsum crystals; strongly effervescent; moderately alkaline; gradual smooth; clear wavy.

Bk3—63 to 98 centimeters (25 to 39 inches); yellow (10YR 7/6) clay, brownish yellow (10YR 6/6), moist; weak coarse subangular blocky structure; very hard, very firm; 5 percent pressure faces; 1 percent fine carbonate nodules; 1 percent fine gypsum crystals; strongly effervescent; moderately alkaline clear smooth; clear wavy.

Bky—98 to 131 centimeters (39 to 52 inches); yellow (10YR 7/6) clay, brownish yellow (10YR 6/6), moist; weak coarse subangular structure; very hard, very firm; 1 percent fine black (10YR 2/1) iron-manganese nodules; 1 percent shell fragments; 2 percent fine carbonate masses; 1 percent fine carbonate nodules; 2 percent fine gypsum crystals; strongly effervescent; moderately alkaline; gradual wavy.

BCky—131 to 203 centimeters (52 to 80 inches); yellow (10YR 7/8) clay, brownish yellow (10YR 6/8), moist; 3 percent black (10YR 2/1) iron-manganese masses; 2 percent medium carbonate masses; 3 percent fine gypsum crystals; strongly effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 6
Chroma: 1 to 3
Other features: A horizons with moist color values of less than 3.5, are less than 7 inches thick, or are less than 1/3 of the thickness of the solum.
Texture: sandy clay loam
Clay content: 27 to 45 percent
Coarse fragments: amount—0 to 35 percent; size—pebbles or cobbles; kind—ironstone or siliceous
EC (dS/m): 0 to 4
Effervescence: slight or strong
Reaction: slightly alkaline or moderately alkaline

Bk horizon

Hue: 5YR to 2.5Y
Value: 4 to 7
Chroma: 1 to 6
Texture: clay loam or clay
Clay content: 35 to 55 percent

Coarse fragments: amount—0 to 5 percent; size—pebbles; kind—siliceous
Identifiable secondary calcium carbonate: amount—2 to 10 percent; kind—films, threads, masses, and concretions
EC (dS/m): 0 to 4
Effervescence: strong or violent
Reaction: slightly alkaline or moderately alkaline

Bky horizon (where present)

Hue: 5YR to 2.5Y
Value: 4 to 7
Chroma: 1 to 6
Texture: clay loam or clay
Clay content: 35 to 55 percent
Coarse fragments: amount—0 to 5 percent; size—pebbles; kind—siliceous
Identifiable secondary calcium carbonate: amount—2 to 10 percent; kind—films, threads, masses, and concretions
Gypsum: amount—1 to 10 percent; kind—films, threads, masses, and clusters
Soluble salt accumulations: amount—1 to 10 percent; kind—threads, masses, and clusters
EC (dS/m): 0 to 4
Effervescence: strong or violent
Reaction: slightly alkaline or moderately alkaline

BCky horizon (where present)

Hue: 5YR to 2.5Y
Value: 4 to 7
Chroma: 1 to 8
Texture: clay loam, silty clay, or clay
Clay content: 35 to 55 percent
Coarse fragments: amount—0 to 5 percent; size—pebbles; kind—siliceous
Identifiable secondary calcium carbonate: amount—2 to 10 percent; kind—films, threads, masses, and concretions
EC (dS/m): 0 to 4
Effervescence: strong or violent
Reaction: slightly alkaline or moderately alkaline

Sinton Series

The Sinton series consists of very deep, well drained, moderately permeable soils that formed in loamy alluvium. These soils are on nearly level crevasse fillings of rivers and streams. Slope is 0 to 1 percent. Soils of the Sinton series are fine-loamy, mixed, superactive, hyperthermic Cumulic Haplustolls.

Typical pedon of Sinton sandy clay loam in an area of Sinton sandy clay loam, 0 to 1 percent slopes, occasionally flood; from the intersection of Farm Road 1351 and Newton-Powell Road, 1.1 miles west on Newton-Powell Road to private road, 0.4 mile south on private road, and 50 feet east in pastureland. Charco USGS topographic quadrangle; Latitude: 28 degrees, 39 minutes, 58.99 seconds North; Longitude: 97 degrees, 35 minutes, 19.58 seconds West; NAD 83.

Ap—0 to 14 centimeters (0 to 6 inches); dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2), moist; weak medium subangular blocky structure; very friable, moderately hard, nonsticky, nonplastic; common very fine and fine roots; common fine low-continuity irregular pores; slightly effervescent; moderately alkaline; clear smooth boundary.

A1—14 to 43 centimeters (6 to 17 inches); dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2), moist; weak fine subangular blocky structure; friable, moderately hard, nonsticky, nonplastic; common very fine and fine roots; common very fine low-continuity irregular pores; 1 percent subrounded indurated 5 to 20 millimeter chert fragments; strongly effervescent; moderately alkaline; clear smooth boundary.

A2—43 to 74 centimeters (17 to 29 inches); dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2), moist; weak medium prismatic structure parting to weak medium subangular blocky; friable, hard, slightly sticky, slightly plastic; common very fine roots; common very fine moderate-continuity tubular pores; 3 percent medium prominent threadlike very pale brown (10YR 8/2) carbonate masses; strongly effervescent; moderately alkaline; clear smooth boundary.

A3—74 to 103 centimeters (29 to 41 inches); dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2), moist; weak medium prismatic structure parting to weak medium subangular blocky; friable, hard, slightly sticky, slightly plastic; common very fine roots; common very fine low-continuity tubular pores; 4 percent medium prominent threadlike very pale brown (10YR 8/2) carbonate masses; slightly effervescent; moderately alkaline; gradual smooth boundary.

Bw1—103 to 134 centimeters (41 to 53 inches); pinkish gray (7.5YR 7/2) clay loam, brown (7.5YR 5/3), moist; weak coarse prismatic structure parting to weak medium subangular blocky; firm, very hard, moderately sticky, moderately plastic; common very fine roots; common fine moderate-continuity tubular pores; 4 percent medium prominent threadlike very pale brown (10YR 8/2) carbonate masses; violently effervescent; moderately alkaline; clear smooth boundary.

Bw2—134 to 159 centimeters (53 to 63 inches); pinkish gray (7.5YR 7/2) clay loam, brown (7.5YR 5/3), moist; 33 percent clay; weak coarse subangular blocky structure; firm, very hard, moderately sticky, moderately plastic; common very fine roots; common fine moderate-continuity tubular pores; 2 percent medium prominent threadlike white (10YR 8/1) carbonate masses and 2 percent coarse prominent irregular very weakly cemented white (10YR 8/1) carbonate masses; violently effervescent; moderately alkaline; clear smooth boundary.

Bw3—159 to 203 centimeters (63 to 80 inches); pinkish gray (7.5YR 7/2) clay loam, light brown (7.5YR 6/3), moist; weak coarse subangular blocky structure; firm, very hard, moderately sticky, moderately plastic; common fine moderate-continuity irregular pores; 5 percent fine prominent threadlike very pale brown (10YR 8/2) carbonate masses with sharp boundaries between peds; 3 percent coarse prominent irregular very weakly cemented white (10YR 8/1) carbonate masses; violently effervescent, moderately alkaline.

Ap and A1 horizons

Hue: 7.5YR or 10YR
Value: 3 or 4
Chroma: 1 to 3
Texture: sandy clay loam
Effervescence: none to slight
Reaction: slightly alkaline or moderately alkaline

A2 and A3 horizons

Hue: 7.5YR or 10YR
Value: 3 or 4
Chroma: 1 to 3
Texture: sandy clay loam, loam, or clay loam
Effervescence: none to slight
Reaction: slightly alkaline or moderately alkaline

Bw horizon

Hue: 7.5YR or 10YR
Value: 4 to 8
Chroma: 1 to 6
Texture: fine sandy loam, loam, sandy clay loam, or clay loam with thin discontinuous bedding planes and lenses of various textures
Identifiable secondary calcium carbonate: amount—0 to 3 percent; size—fine and medium; kind—films and threads; location—throughout
Effervescence: none to slight
Reaction: slightly alkaline or moderately alkaline

Bk horizon (where present)

Hue: 7.5YR or 10YR
Value: 4 to 8
Chroma: 2 to 6
Texture: loamy fine sand, fine sandy loam, loam, sandy clay loam, or clay loam with thin discontinuous bedding planes and lenses of various textures.
Identifiable secondary calcium carbonate: amount—0 to 3 percent; size—fine and medium; kind—films and threads; location—throughout
Effervescence: none to slight
Reaction: slightly alkaline or moderately alkaline

Telferner Series

The Telferner series consists of very deep, moderately well drained, soils that formed in loamy fluviomarine deposits of the Beaumont Formation of Pleistocene age. These nearly level to gently sloping soils are on ancient meander ridges. Slope ranges from 0 to 3 percent, but are usually less than 1 percent. Soils of the Telferner series are fine smectitic, hyperthermic Oxyaquic Vertic Hapludalfs.

Typical pedon of Telferner fine sandy loam in an area of Telferner fine sandy loam, 0 to 1 percent slopes; from the intersection of Farm Road 2987 and U.S. Highway 59 in Fannin, 1.5 miles east on U.S. Highway 59 to private road, 1.25 miles south on private road to east running road, 0.6 mile east on road to pipeline right-of-way, 500 feet southwest on right-of-way, and 50 feet east in rangeland. Fannin USGS topographic quadrangle; Latitude: 28 degrees, 40 minutes, 51.30 seconds North; Longitude: 97 degrees, 12 minutes, 29.80 seconds West; NAD 83.

A—0 to 23 centimeters (0 to 9 inches); dark grayish brown (10YR 4/2) fine sandy loam, grayish brown (10YR 5/2), dry; moderate fine and medium subangular blocky structure parting to moderate fine granular; friable, slightly hard; many fine roots and many very fine roots; common fine tubular pores; slightly acid; abrupt wavy boundary.

Bt1—23 to 41 centimeters (9 to 16 inches); dark grayish brown (10YR 4/2) sandy clay, dark grayish brown (10YR 4/2), dry; moderate medium prismatic structure parting to moderate medium angular blocky; very firm, very hard; common fine roots and many very fine roots; common very fine tubular pores; 5 percent prominent pressure faces on all faces of peds; 20 percent distinct very dark gray (10YR 3/1) clay films on vertical faces of peds; 20 percent prominent very dark gray (10YR 3/1) organic stains on vertical faces of peds; 2 percent fine prominent strong brown (7.5YR 5/6) masses of oxidized iron with clear boundaries lining pores; 5 percent fine and medium prominent yellowish red (5YR 5/6) masses of oxidized iron with clear boundaries in matrix; 7 percent medium distinct yellowish brown (10YR 5/6) masses of oxidized iron with clear boundaries in matrix; neutral; clear wavy boundary.

Bt2—41 to 58 centimeters (16 to 23 inches); grayish brown (10YR 5/2) sandy clay, light brownish gray (10YR 6/2), dry; moderate medium prismatic structure parting to moderate medium angular blocky; very firm, very hard; common fine roots and many very fine roots; 10 percent distinct clay films; 15 percent prominent dark grayish brown (10YR 4/2) organic stains on vertical faces of peds; 25 percent prominent grayish brown (10YR 5/2) sand coats on vertical faces of peds; 20 percent medium prominent reddish yellow (7.5YR 6/8) masses of oxidized iron with clear boundaries in matrix; 2 percent fine prominent red (2.5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; 10 percent medium and coarse prominent yellowish red (5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; neutral; clear wavy boundary.

Bt3—58 to 74 centimeters (23 to 29 inches); light olive brown (2.5Y 5/3) sandy clay, light olive brown (2.5Y 5/3), dry; moderate fine and medium subangular blocky structure; firm, hard; common very fine roots; 5 percent distinct dark grayish brown (10YR 4/2) organic stains on vertical faces of peds; 20 percent prominent grayish brown (10YR 5/2) clay films on vertical faces of peds; 1 percent fine distinct very dark brown (10YR 2/2) iron-manganese nodules in matrix; 2 percent fine distinct brownish yellow (10YR 6/6) masses of oxidized iron with sharp boundaries in matrix; 2 percent fine distinct yellowish brown (10YR 5/6) masses of oxidized iron with clear boundaries in matrix; 5 percent fine prominent yellowish red (5YR 5/6) masses of oxidized iron with sharp boundaries in matrix; 3 percent fine and medium faint grayish brown (2.5Y 5/2) iron depletions with sharp boundaries in matrix; neutral; clear smooth boundary.

Btk1—74 to 107 centimeters (29 to 42 inches); light olive brown (2.5Y 5/3) sandy clay loam, light yellowish brown (2.5Y 6/3), dry; moderate fine and medium subangular blocky structure; firm, slightly hard; common very fine roots; 1 percent fine distinct very dark brown (10YR 2/2) iron-manganese masses with sharp boundaries in matrix; 2 percent fine and medium and 1 percent coarse carbonate nodules in matrix; 5 percent medium and coarse carbonate masses in matrix; slightly alkaline; gradual smooth boundary.

Btk2—107 to 147 centimeters (42 to 58 inches); light olive brown (2.5Y 5/3) sandy clay loam, pale yellow (2.5Y 7/3), dry; weak fine and medium subangular blocky structure; firm, slightly hard; 1 percent fine distinct spherical very dark brown (10YR 2/2) iron-manganese masses with sharp boundaries in matrix; 5 percent medium carbonate nodules in matrix; 7 percent medium and coarse carbonate masses in matrix and 1 percent coarse and very coarse carbonate masses in matrix; moderately alkaline; gradual smooth boundary.

Btk3—147 to 183 centimeters (58 to 80 inches); pale brown (10YR 6/3) sandy clay loam, very pale brown (10YR 7/3), dry; weak fine and medium subangular blocky structure; firm, slightly hard; 1 percent fine distinct spherical very dark brown (10YR 2/2) iron-manganese masses with sharp boundaries in matrix; 2 percent fine and medium spherical carbonate nodules in matrix; 2 percent fine and medium threadlike carbonate masses in matrix and 10 percent medium and coarse irregular carbonate masses in matrix; moderately alkaline.

A horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: fine sandy loam
Clay content: 8 to 18 percent
Redox concentrations: amount—0 to 2 percent; shades—brown
Iron-manganese concentrations: amount—0 to 2 percent; kind—concretions

Coarse fragments: amount—0 to 1 percent; kind—siliceous; size—2 to 10 millimeters
Reaction: slightly acid or neutral

E horizon (where present)

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: very fine sandy loam or fine sandy loam
Clay content: 8 to 18 percent
Redox concentrations: amount—0 to 2 percent; shades—brown
Iron-manganese concentrations: amount—0 to 2 percent; kind—concretions
Coarse fragments: amount—0 to 1 percent; kind—siliceous; size—2 to 10 millimeters
Reaction: slightly acid or neutral

Upper Bt horizon

Hue: 10YR or 2.5Y
Value: 4 to 6
Chroma: 1 or 2
Texture: clay loam, sandy clay, or clay
Clay content: 35 to 50 percent
Redox concentrations: amount—2 to 15 percent; shades—red, brown, or yellow
Iron-manganese concentrations: amount—0 to 2 percent; kind—concretions
Coarse fragments: amount—0 to 1 percent; kind—siliceous; size—2 to 10 millimeters
Reaction: slightly acid or neutral

Lower Bt horizon

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 to 3
Texture: clay loam, sandy clay, or clay
Clay content: 35 to 50 percent
Redox concentrations: amount—2 to 15 percent; shades—red, brown, or yellow
Iron-manganese concentrations: amount—0 to 2 percent; kind—concretions
Coarse fragments: amount—0 to 1 percent; kind—siliceous; size—2 to 10 millimeters
Reaction: neutral to moderately alkaline

Btk or Bk horizon (where present)

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 to 3
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 20 to 40 percent
Redox concentrations: amount—2 to 15 percent; shades—red, brown, or yellow
Iron-manganese concentrations: amount—0 to 2 percent; kind—concretions
Identifiable secondary calcium carbonate: amount—2 to 8 percent; kind—concretions or masses
Coarse fragments: amount—0 to 1 percent; kind—siliceous; size—2 to 10 millimeters
Reaction: slightly alkaline or moderately alkaline

Tiocano Series

The Tiocano series consists of very deep, somewhat poorly drained, very slowly permeable soils. These soils formed in clayey sediments of Pleistocene age. Slope is 0 to 1 percent. Soils of the Tiocano series are fine, smectitic, hyperthermic Udic Haplusterts.

Typical pedon of Tiocano clay in an area of Tiocano clay, 0 to 1 percent slopes; from the intersection of Riverdale Road and U.S. Highway 59, 0.9 mile northwest on U.S. Highway 59 to private road, 0.1 mile south on private road, and 200 feet east in depression. Berclair USGS topographic quadrangle; Latitude: 28 degrees, 34 minutes, 47.60 seconds North; Longitude: 97 degrees, 31 minutes, 9.00 seconds West; NAD 83.

A—0 to 23 centimeters (0 to 9 inches); black (10YR 2/1) clay, black (10YR 2/1), moist; strong medium subangular blocky structure; hard, firm; common fine roots throughout and common very fine roots; neutral; gradual smooth boundary.

Bss1—23 to 64 centimeters (9 to 25 inches); very dark gray (10YR 3/1) clay, black (10YR 2/1), moist; strong coarse angular blocky structure; hard, very firm; common very fine roots; 25 percent black (10YR 2/1) slickensides (pedogenic) on all faces of peds; neutral; gradual smooth boundary.

Bss2—64 to 86 centimeters (25 to 34 inches); dark gray (2.5Y 4/1) clay, very dark gray (2.5Y 3/1), moist; moderate medium angular blocky structure; very hard, very firm; common very fine roots; 25 percent distinct very dark gray (10YR 3/1) slickensides (pedogenic) on all faces of peds; 5 percent grayish brown (10YR 5/2) infilled cracks; slightly alkaline; clear smooth boundary.

BCk—86 to 170 centimeters (34 to 67 inches); pale brown (10YR 6/3) sandy clay, pale brown (10YR 6/3), moist; weak medium angular blocky structure; hard, firm; 20 percent dark gray (10YR 4/1) infilled cracks; 10 percent fine and medium carbonate nodules with sharp boundaries; 10 percent dark yellowish brown (10YR 4/6) masses of oxidized iron with sharp boundaries in matrix; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2Ck—170 to 203 centimeters (67 to 80 inches); very pale brown (10YR 7/3) fine sandy loam, pale brown (10YR 6/3), moist; massive; slightly hard, very friable; 10 percent medium carbonate masses; strong effervescence, moderately alkaline.

A horizon

Hue: 10YR
Value: 2 to 5
Chroma: 1
Texture: clay
Effervescence: none or slight
Reaction: neutral to moderately alkaline

Bss horizon

Hue: 10YR or 2.5Y
Value: 2 to 6
Chroma: 1
Texture: clay
Clay content: 40 to 60 percent
Identifiable secondary calcium carbonate: amount—0 to 5 percent; size—fine; kind—masses; location—throughout
Effervescence: none to strong
Reaction: neutral to moderately alkaline

BCk horizon

Hue: 10YR or 2.5Y
Value: 4 to 6
Chroma: 1 to 3
Texture: sandy clay, sandy clay loam, or clay loam
Clay content: 40 to 60 percent
Identifiable secondary calcium carbonate: amount—0 to 5 percent; size—fine; kind—masses; location—throughout

Effervescence: none to strong
Reaction: neutral to moderately alkaline

2Ck horizon (where present)

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 to 3
Texture: fine sandy loam, loam, or sandy clay loam
Clay content: 15 to 25 percent
Identifiable secondary calcium carbonate: amount—0 to 5 percent; size—fine; kind—masses; location—throughout
Effervescence: none to strong
Reaction: neutral to moderately alkaline

Vidauri Series

The Vidauri series consists of very deep, somewhat poorly drained soils that formed in fluviomarine deposits of Early Pleistocene age. These nearly level soils are on weakly defined drainageways on the coastal plain. Slope is 0 to 1 percent. Soils of the Vidauri series are fine-loamy, mixed, active, hyperthermic Aquic Haplustalfs.

Typical pedon of Vidauri fine sandy loam in an area of Vidauri fine sandy loam, 0 to 1 percent slopes; from the intersection of U.S. Highway 183 and Texas Highway 239 south of Goliad, 8.2 miles southeast on Texas Highway 239 to gate on south side of road, 3.1 miles south on ranch road to gate, 0.2 mile west along fence, and 100 feet south of fence in rangeland. Live Oak Lake topographic quadrangle; Latitude: 28 degrees, 33 minutes, 27.5 seconds North; Longitude: 97 degrees, 16 minutes, 47.5 seconds West; NAD 83.

A—0 to 10 centimeters (0 to 4 inches); light brownish gray (10YR 6/2) and 20 percent grayish brown (10YR 5/2) fine sandy loam, grayish brown (10YR 5/2) and 20 percent dark grayish brown (10YR 4/2), moist; massive; firm, very hard; common fine roots and many very fine roots; common very fine to medium tubular pores; 1 percent fine faint dark yellowish brown (10YR 4/4) masses of oxidized iron with diffuse boundaries on faces of peds; 1 percent fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron with diffuse boundaries lining pores; moderately acid; clear wavy boundary.

Bt1—10 to 23 centimeters (4 to 9 inches); grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2), moist; weak very coarse subangular blocky structure; very firm, very hard; common very fine roots; common very fine to medium tubular pores; 30 percent faint prominent very dark gray (2.5Y 3/1) clay films on all faces of peds; 1 percent fine distinct spherical brown (7.5YR 4/4) iron-manganese masses with clear boundaries on faces of peds; 1 percent fine distinct yellowish brown (10YR 5/6) masses of oxidized iron with diffuse boundaries on faces of peds; moderately acid; clear wavy boundary.

Bt2—23 to 48 centimeters (9 to 19 inches); gray (10YR 5/1) clay loam, dark gray (10YR 4/1), moist; moderate medium prismatic structure parting to moderate medium angular blocky; very firm, very hard; common very fine roots; common very fine tubular pores; 10 percent faint prominent very dark gray (2.5Y 3/1) clay films on all faces of peds; 10 percent faint prominent very dark gray (10YR 3/1) clay films on all faces of peds; 2 percent fine faint brown (10YR 4/3) masses of iron-manganese with clear boundaries on faces of peds; slightly acid; clear wavy boundary.

Bt3—48 to 81 centimeters (19 to 32 inches); dark gray (2.5Y 4/1) sandy clay loam, dark gray (2.5Y 4/1), moist; moderate medium prismatic structure parting to moderate medium angular blocky; firm, hard; common very fine roots; common very fine tubular pores; 10 percent distinct very dark gray (2.5Y 3/1) clay films on all faces of peds; 15 percent distinct dark gray (2.5Y 4/1) clay films on all faces of peds; 2 percent fine distinct dark yellowish brown (10YR 4/4) masses of iron-manganese with clear boundaries on faces of peds; 2 percent fine distinct dark brown (10YR 3/3) masses of iron-manganese with clear boundaries on faces of peds; neutral; clear wavy boundary.

Bt4—81 to 104 centimeters (32 to 41 inches); light gray (2.5Y 7/2) sandy clay loam, light brownish gray (2.5Y 6/2), moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse angular blocky; firm, hard; common very fine roots; few very fine tubular pores; 20 percent distinct light brownish gray (2.5Y 6/2) clay films on all faces of peds; 20 percent distinct grayish brown (10YR 5/2) clay films on all faces of peds; 2 percent fine faint dark brown (7.5YR 3/3) masses of iron-manganese with clear boundaries on faces of peds; 1 percent insect casts; slightly alkaline; clear wavy boundary.

Btk—104 to 124 centimeters (41 to 49 inches); light gray (2.5Y 7/2) sandy clay loam, light brownish gray (2.5Y 6/2), moist; weak coarse prismatic structure parting to weak coarse subangular blocky; firm, hard; few very fine roots; few very fine tubular pores; 20 percent distinct light brownish gray (2.5Y 6/2) clay films on all faces of peds; 1 percent fine white (2.5Y 8/1) nodules of calcium carbonate; 1 percent medium and coarse white (2.5Y 8/1) masses of calcium carbonate; 1 percent fine prominent black (7.5YR 2.5/1) masses of iron-manganese with sharp boundaries on faces of peds; 2 percent fine prominent dark brown (7.5YR 3/3) masses of iron-manganese with clear boundaries on faces of peds; moderately alkaline; clear wavy boundary.

Btkn1—124 to 150 centimeters (49 to 59 inches); light gray (2.5Y 7/2) sandy clay, light gray (2.5Y 7/2), moist; weak coarse prismatic structure parting to weak coarse angular blocky; firm, hard; few very fine roots; 20 percent distinct light gray (2.5Y 7/2) clay films on all faces of peds; 1 percent fine white (2.5Y 8/1) nodules of calcium carbonate; 1 percent medium and coarse white (5Y 8/1) masses of calcium carbonate; 2 percent fine prominent dendritic black (7.5YR 2.5/1) masses of iron-manganese with sharp boundaries on faces of peds; 5 percent fine prominent strong brown (7.5YR 5/8) masses of oxidized iron with sharp boundaries on vertical faces of peds; moderately alkaline; clear wavy boundary.

Btkn2—150 to 203 centimeters (59 to 80 inches); light gray (2.5Y 7/2) sandy clay loam, light gray (2.5Y 7/2), moist; weak coarse subangular blocky structure; firm, hard; 15 percent distinct light gray (2.5Y 7/2) clay films on all faces of peds; 1 percent fine and medium white (2.5Y 8/1) nodules of calcium carbonate; 1 percent medium and coarse white (5Y 8/1) masses of calcium carbonate; 3 percent fine prominent yellowish red (5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 10 percent medium and coarse prominent strong brown (7.5YR 5/8) masses of oxidized iron with clear boundaries on vertical faces of peds; strongly alkaline.

A horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: fine sandy loam
Clay content: 12 to 20 percent
Masses of oxidized iron: amount—2 to 4 percent; shades—brown
Iron depletions: amount—0 to 2 percent; shades—gray
EC: 0 to 1
SAR: 0 to 2
Reaction: strongly acid to slightly acid

Upper Bt horizon

Hue: 10YR
Value: 4 to 6
Chroma: 1 or 2
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 30 to 40 percent
Masses of oxidized iron: amount—2 to 12 percent; shades—brown or yellow
Iron depletions: amount—0 to 8 percent; shades—gray
EC: 0 to 2
SAR: 1 to 4
Reaction: moderately acid or slightly acid

Lower Bt horizon

Hue: 10YR or 2.5Y
Value: 4 to 7
Chroma: 1 or 2
Texture: sandy clay loam or clay loam
Clay content: 25 to 33 percent
Masses of oxidized iron: amount—2 to 12 percent; shades—brown or yellow
Iron depletions: amount—0 to 8 percent; shades—gray
EC: 0.1 to 2
SAR: 2 to 10
Reaction: slightly acid or neutral

Btk horizon

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 or 2
Texture: sandy clay loam or clay loam
Clay content: 25 to 33 percent
Masses of oxidized iron: amount—2 to 12 percent; shades—brown or yellow
Iron depletions: amount—0 to 8 percent; shades—gray
Calcium carbonate equivalent: 1 to 5 percent
Identifiable secondary calcium carbonate: amount—1 to 5; size—fine or medium; kind—nodules or masses
EC: 0.2 to 2
SAR: 4 to 12
Reaction: slightly alkaline or moderately alkaline

Btkn horizons (where present)

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 or 2
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 25 to 36 percent
Masses of oxidized iron: amount—2 to 12 percent; shades—brown or yellow
Iron depletions: amount—0 to 8 percent; shades—gray
Calcium carbonate equivalent: 1 to 5 percent
Identifiable secondary calcium carbonate: amount—1 to 5; size—fine or medium; kind—nodules or masses
EC: 0.2 to 4
SAR: 12 to 25
Reaction: moderately alkaline or strongly alkaline

Weesatche Series

The Weesatche series consists of very deep, well drained, moderately permeable soils that formed in calcareous loamy residuum weathered from sandstone of Pliocene age. These soils are on nearly level to gently sloping summits, backslopes, and footslopes of paleoterraces. Slope ranges from 0 to 5 percent. Soils of the Weesatche series are fine-loamy, mixed, superactive, hyperthermic Typic Argiustolls.

Typical pedon of Weesatche sandy clay loam (fig. 40) in an area of Weesatche sandy clay loam, 1 to 3 percent slopes from the intersection of Farm Road 1351 and Newton-Powell Road, 100 feet south on Farm Road 1351 to private ranch entrance, 0.3 mile west, 0.3 mile south, 1.6 mile west and southwest, and 75 feet west in rangeland. Charco USGS topographic quadrangle; Latitude: 28 degrees, 38 minutes, 17.70 seconds North; Longitude: 97 degrees, 36 minutes, 19.40 seconds West; NAD 83.

A—0 to 13 centimeters (0 to 5 inches); black (7.5YR 2.5/1) sandy clay loam, dark brown (7.5YR 3/2), moist; weak fine subangular blocky structure parting to moderate medium granular; friable, slightly hard; many fine and very fine and common medium roots; common medium vesicular and many very fine tubular pores; slightly alkaline; clear smooth boundary.

Bt1—13 to 31 centimeters (5 to 12 inches); black (7.5YR 2.5/1) sandy clay loam, very dark gray (7.5YR 3/1), moist; moderate medium prismatic structure parting to moderate medium subangular blocky; friable, moderately hard; common fine roots and medium roots and many very fine roots; many very fine tubular pores; 15 percent distinct black (7.5YR 2.5/1) clay films; slightly alkaline; gradual smooth boundary.

Bt2—31 to 70 centimeters (12 to 27 inches); brown (7.5YR 4/3) sandy clay, brown (7.5YR 4/3), moist; moderate medium prismatic structure parting to strong medium angular blocky structure; friable, moderately hard; many very fine roots; common very fine tubular pores; 25 percent prominent dark brown (7.5YR 3/2) clay films; slightly alkaline; gradual smooth boundary.

Btk—70 to 94 centimeters (27 to 37 inches); brown (7.5YR 5/3) clay loam, light brown (7.5YR 6/3), moist; moderate medium and coarse prismatic parting structure to strong medium angular blocky; friable, hard; common very fine roots; common very fine tubular pores; 20 percent distinct brown (7.5YR 4/2) clay films; 3 percent fine and medium carbonate masses; 3 percent distinct dark grayish brown (10YR 3/2) infilled cracks; slightly effervescent; moderately alkaline; gradual wavy boundary.

Bk1—94 to 154 centimeters (37 to 61 inches); light brown (7.5YR 6/3) silt loam; weak coarse prismatic structure parting to moderate medium and coarse angular blocky; friable, hard; common very fine roots; common very fine tubular pores; 5 percent fine and medium carbonate nodules and 25 percent coarse carbonate masses; 5 percent distinct dark grayish brown (10YR 3/2) infilled cracks; violently effervescent; moderately alkaline; gradual wavy boundary.

Bk2—154 to 203 centimeters (61 to 80 inches); brown (7.5YR 5/3) clay loam; moderate medium and coarse subangular blocky structure; friable, hard; common very fine roots; common very fine tubular pores; 5 percent fine and medium carbonate nodules and 20 percent coarse carbonate masses; 5 percent distinct grayish brown (10YR 4/2) infilled cracks; strongly effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 2 to 5
Chroma: 1 to 3
Texture: fine sandy loam or sandy clay loam
Reaction: neutral or slightly alkaline

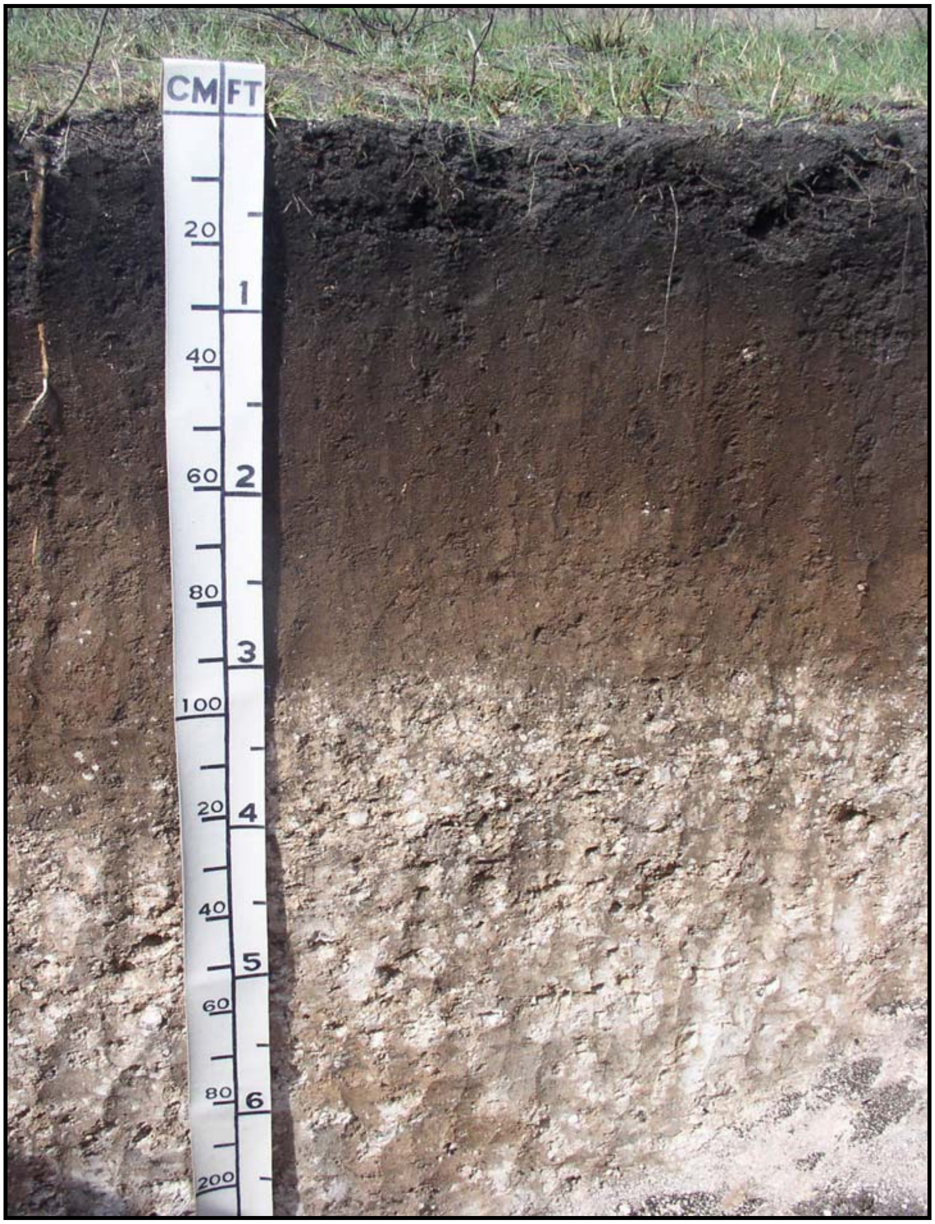

Figure 40.—Profile of Weesatche sandy clay loam, 1 to 3 percent slopes. The depth to secondary carbonates typically occurs within a depth of 45 to 100 centimeters (18 to 40 inches). (Scale in centimeters and feet.)

Upper Bt horizon

Hue: 5YR to 10YR
Value: 2 to 5
Chroma: 1 to 4
Texture: sandy clay loam, clay loam, or sandy clay
Clay content: 25 to 38 percent
Redox concentrations: amount—none to common; shades—red, brown, or yellow
Effervescence: none or very slight
Reaction: slightly alkaline or moderately alkaline

Lower Bt horizon

Hue: 5YR to 10YR
Value: 3 to 5
Chroma: 1 to 4
Texture: sandy clay loam or clay loam
Clay content: 20 to 35 percent
Redox concentrations: amount—none to common; shades—red, brown, or yellow
Effervescence: none or very slight in lower horizons
Reaction: slightly alkaline or moderately alkaline

Bk or Btk horizon (where present)

Hue: 5YR to 10YR
Value: 3 to 7
Chroma: 2 to 8
Texture: loam, silt loam, sandy clay loam, or clay loam
Clay content: 20 to 35 percent
Calcium carbonate equivalent: 10 to 65 percent
Effervescence: slight to violent
Reaction: slightly alkaline or moderately alkaline

Woodsboro Series

The Woodsboro series consists of very deep, poorly drained, very slowly permeable soils that formed in fluviomarine deposits of Pleistocene age. These nearly level soils are in drainageways on the Texas Gulf Coastal Plain. Slope is 0 to 1 percent. Soils of the Woodsboro series are fine, smectitic, hyperthermic Vertic Natraqualfs.

Typical pedon of Woodsboro loam, in an area of Woodsboro loam, from the intersection of U.S. Highway 77 and U.S. Highway 183 in Refugio, 11.3 miles north on U.S. Highway 77, 6.4 miles northwest on ranch road to Welder West Headquarters, 0.7 mile west on ranch road, 0.2 mile north on ranch road, and about 300 feet west in rangeland. Vidauri USGS topographic quadrangle; Latitude: 28 degrees, 29 minutes, 4 seconds North; Longitude: 97 degrees, 13 minutes, 12.2 seconds West; NAD 83.

A—0 to 15 centimeters (0 to 6 inches); dark grayish brown (10YR 4/2) loam, grayish brown (10YR 5/2), dry; moderate fine and medium subangular blocky structure parting to weak fine granular; firm, hard, slightly sticky, slightly plastic; many very fine and common fine roots; common fine tubular pores; 1 percent faint light gray (10YR 7/2) sand coats on all faces of peds; 5 percent fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron with clear boundaries lining pores; EC is 1.2; SAR is 13; neutral; clear smooth boundary.

Btng1—15 to 51 centimeters (6 to 20 inches); dark grayish brown (10YR 4/2) clay, grayish brown (10YR 5/2), dry; moderate medium and coarse angular blocky structure parting to moderate fine and medium angular blocky; very firm, very hard, very sticky, very plastic; common fine roots and many very fine roots; common fine tubular pores; 1 percent distinct light gray (10YR 7/2) sand coats on vertical faces of peds; 10 percent distinct very dark gray (10YR 3/1) organic stains on all faces of peds; 10 percent distinct pressure faces; 20 percent distinct clay films on vertical faces of peds; 2 percent fine distinct yellowish brown (10YR 5/6) masses of oxidized iron with clear boundaries in matrix; EC is 2.8; SAR is 23; very slightly effervescent; moderately alkaline; gradual wavy boundary.

Btng2—51 to 66 centimeters (20 to 26 inches); gray (10YR 5/1) clay, gray (10YR 6/1), dry; strong medium and coarse angular blocky structure parting to moderate fine and medium angular blocky; very firm, very hard, very sticky, very plastic; common fine roots and many very fine roots; common fine tubular pores; 3

percent distinct light gray (10YR 7/2) sand coats on vertical faces of peds; 3 percent distinct very dark brown (10YR 2/2) organic stains on all faces of peds; 5 percent prominent pressure faces on vertical faces of peds; 20 percent distinct clay films on vertical faces of peds; 1 percent fine prominent dark yellowish brown (10YR 4/6) masses of oxidized iron with diffuse boundaries lining pores; 2 percent fine distinct light yellowish brown (10YR 6/4) masses of oxidized iron with clear boundaries in matrix; 5 percent fine and medium prominent yellowish brown (10YR 5/6) masses of oxidized iron with clear boundaries in matrix; EC is 5.0; SAR is 36; very slightly effervescent; moderately alkaline; gradual wavy boundary.

Btng3—66 to 81 centimeters (26 to 32 inches); gray (10YR 6/1) sandy clay, light gray (10YR 7/1), dry; strong medium and coarse angular blocky structure parting to moderate fine and medium angular blocky; very firm, very hard, very sticky, very plastic; many very fine roots; common fine tubular pores; 2 percent prominent light gray (10YR 7/2) sand coats on vertical faces of peds; 10 percent prominent pressure faces on vertical faces of peds; 15 percent distinct clay films on vertical faces of peds; 1 percent fine distinct spherical black (10YR 2/1) masses of manganese with sharp boundaries in matrix; 2 percent fine and medium prominent strong brown (7.5YR 5/6) masses of oxidized iron with clear boundaries in matrix; 2 percent fine prominent dark yellowish brown (10YR 4/6) masses of oxidized iron with sharp boundaries lining pores; 5 percent fine and medium distinct light yellowish brown (10YR 6/4) masses of oxidized iron with clear boundaries in matrix; 10 percent fine and medium prominent yellowish brown (10YR 5/6) masses of oxidized iron with clear boundaries in matrix; EC is 8.0; SAR is 53; very slightly effervescent; moderately alkaline; gradual wavy boundary.

Btkn1—81 to 97 centimeters (32 to 38 inches); grayish brown (2.5Y 5/2) clay loam, light brownish gray (2.5Y 6/2), dry; moderate medium and coarse angular blocky structure; very firm, very hard, very sticky, very plastic; many very fine roots; common fine tubular pores; 5 percent distinct clay films on vertical faces of peds; 5 percent distinct grayish brown (10YR 5/2) organic stains on all faces of peds; 5 percent fine and medium nodules of calcium carbonate; 7 percent fine to coarse masses of calcium carbonate; 3 percent fine distinct spherical black (10YR 2/1) masses of manganese with sharp boundaries in matrix; 2 percent fine and medium distinct dark yellowish brown (10YR 4/4) masses of oxidized iron with clear boundaries lining pores; EC is 4.5; SAR is 18; slightly effervescent; strongly alkaline; gradual smooth boundary.

Btkn2—97 to 137 centimeters (38 to 54 inches); light yellowish brown (2.5Y 6/3) sandy clay loam, pale yellow (2.5Y 7/3), dry; moderate fine and medium subangular blocky structure; firm, hard, moderately sticky, moderately plastic; common very fine roots; common fine tubular pores; 5 percent faint clay films on vertical faces of peds; 2 percent faint grayish brown (10YR 5/2) organic stains on all faces of peds; 4 percent fine and medium nodules of calcium carbonate; 3 percent fine to coarse masses of calcium carbonate; 1 percent fine distinct spherical black (10YR 2/1) masses of manganese with sharp boundaries in matrix; 2 percent fine and medium prominent yellowish brown (10YR 5/6) masses of oxidized iron with clear boundaries in matrix; EC is 4.8; SAR is 20; slightly effervescent; strongly alkaline; gradual smooth boundary.

Btkn3—137 to 168 centimeters (54 to 66 inches); light gray (2.5Y 7/2) sandy clay loam, pale yellow (2.5Y 8/2), dry; weak fine and medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine roots; 5 percent faint clay films on vertical faces of peds; 4 percent faint distinct grayish brown (10YR 5/2) organic stains on all faces of peds; 5 percent fine and medium nodules of calcium carbonate; 4 percent fine to coarse masses of calcium carbonate; 2 percent fine and medium prominent spherical very dark brown (10YR 2/2) masses of manganese with sharp boundaries in matrix; 3 percent fine and medium prominent light olive brown (2.5Y 5/6) masses of oxidized iron with clear boundaries in matrix; EC is 4.2; SAR is 23; very slightly effervescent; strongly alkaline; gradual smooth boundary.

Btkn4—168 to 203 centimeters (66 to 80 inches); light gray (2.5Y 7/2) sandy clay loam, pale yellow (2.5Y 8/2), dry; weak fine and medium subangular blocky structure; firm, slightly hard, moderately sticky, moderately plastic; common very fine roots; 5 percent faint clay films on vertical faces of peds; 3 percent fine and medium carbonate masses; 1 percent medium nodules of calcium carbonate; 1 percent fine distinct olive brown (2.5Y 4/4) masses of oxidized iron with clear boundaries lining pores; 3 percent fine and medium distinct light olive brown (2.5Y 5/4) masses of oxidized iron with clear boundaries in matrix; EC is 4.2; SAR is 22; slightly effervescent; strongly alkaline.

A horizon

Hue: 10YR
Value: 4 or 5
Chroma: 1 or 2
Texture: loam
Clay content: 15 to 22 percent
Redox concentrations: amount—2 to 4 percent; shades—brown
EC (dS/m): 1 to 4
SAR: 6 to 20
Reaction: neutral or slightly alkaline

Btng horizon

Hue: 10YR or 2.5Y
Value: 2 to 6
Chroma: 1 or 2
Texture: sandy clay or clay
Clay content: 35 to 45 percent
Redox concentrations: amount—2 to 15 percent; shades—brown or yellow
Calcium carbonate equivalent: 0 to 1 percent
EC (dS/m): 2 to 10
SAR: 13 to 30
Effervescent: none or very slight
Reaction: moderately alkaline

Btkn horizon

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 to 3
Texture: sandy clay loam or clay loam
Clay content: 25 to 35 percent
Redox concentrations: amount—2 to 25 percent; shades—brown or yellow
Calcium carbonate equivalent: 2 to 15 percent
Identifiable secondary calcium carbonate: amount—1 to 15; size—fine to coarse; kind—nodules and masses
EC (dS/m): 4 to 12
SAR: 13 to 25
Effervescent: very slight to strong
Reaction: moderately alkaline

Wyick Series

The Wyick series consists of very deep, moderately well drained, slowly permeable soils that formed in fluviomarine deposits of Early Pleistocene age. These nearly level soils are on flats on the coastal plain. Slope is 0 to 1 percent. Soils of the Wyick series are fine-loamy, mixed, superactive, hyperthermic Oxyaquic Haplustalfs.

Typical pedon of Wyick fine sandy loam (fig. 41) in an area of Wyick fine sandy loam, 0 to 1 percent slopes; from the Refugio and Goliad County Line Marker on Texas Highway 239, 1 mile west on Texas Highway 239 to gate on south side of road, 1.8 miles southwest on ranch road, and located about 100 feet east in rangeland. Lott Lake USGS topographic quadrangle; Latitude: is 28 degrees, 32 minutes, 25 seconds North; Longitude: 97 degrees, 12 minutes, 3.4 seconds West; NAD 83.

A—0 to 15 centimeters (0 to 6 inches); brown (10YR 5/3) fine sandy loam, brown (10YR 4/3), moist; weak medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common fine roots and many very fine roots; common fine tubular pores; 2 percent fine distinct dark yellowish brown (10YR 4/6) masses of oxidized iron with sharp boundaries lining pores at the contact between with Bt1 horizon; moderately acid; abrupt wavy boundary.

Figure 41.—Profile of Wyick fine sandy loam, 0 to 1 percent slopes. These soils occur on flats on the prairie and sometimes are in complex with the Vidauri soils. (Scale in centimeters and meters.)

Bt1—15 to 30 centimeters (6 to 12 inches); grayish brown (10YR 5/2) sandy clay, dark grayish brown (10YR 4/2), moist; moderate coarse prismatic structure parting to moderate medium and coarse angular blocky; very firm, very hard, very sticky, very plastic; many very fine roots; common very fine tubular pores; 1 percent distinct brown (10YR 4/3) sand coats on vertical faces of peds; 10 percent distinct dark grayish brown (10YR 4/2) clay films on all faces of peds; 5 percent fine prominent strong brown (7.5YR 4/6) masses of oxidized iron with sharp boundaries in matrix; 8 percent fine prominent strong brown (7.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; slightly acid; clear wavy boundary.

Bt2—30 to 53 centimeters (12 to 21 inches); gray (10YR 6/1) sandy clay loam, gray (10YR 6/1), moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm, very hard, very sticky, very plastic; many very fine roots; common very fine tubular pores; 10 percent distinct gray (10YR 6/1) clay films on all faces of peds; 2 percent medium distinct black (7.5YR 2.5/1) masses of manganese with sharp boundaries in matrix; 3 percent medium prominent strong brown (7.5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 10 percent medium and coarse prominent yellow (10YR 7/8) masses of oxidized iron with clear boundaries in matrix; neutral; gradual wavy boundary.

Bt3—53 to 76 centimeters (21 to 30 inches); light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2), moist; weak medium and coarse prismatic structure parting to moderate medium subangular blocky; very firm, moderately hard, moderately sticky, moderately plastic; many very fine roots; common very fine tubular pores; 2 percent faint sand coats on all faces of peds; 15 percent distinct dark grayish brown (10YR 4/2) clay films on all faces of peds; 1 percent by volume wormcasts; 3 percent fine and medium distinct very dark brown (10YR 2/2) masses of manganese with diffuse boundaries in matrix; 1 percent fine prominent strong brown (7.5YR 4/6) masses of oxidized iron with sharp boundaries surrounding masses of manganese; 1 percent fine prominent yellowish red (5YR 5/8) masses of oxidized iron with sharp boundaries in matrix; 5 percent fine distinct dark yellowish brown (10YR 4/4) masses of oxidized iron with sharp boundaries in matrix; slightly alkaline; clear wavy boundary.

Btk1—76 to 145 centimeters (30 to 57 inches); light brownish gray (10YR 6/2) sandy clay loam, light brownish gray (10YR 6/2), moist; moderate medium and coarse prismatic parting to moderate medium and coarse subangular blocky; very firm, moderately hard, moderately sticky, moderately plastic; common very fine roots; common very fine tubular pores; 5 percent distinct grayish brown (10YR 5/2) clay films on vertical faces of peds; 1 percent distinct insect casts; 5 percent fine threadlike masses of calcium carbonate; 15 percent medium and coarse masses of calcium carbonate; 5 percent fine and medium nodules of calcium carbonate embedded in masses of calcium carbonate; 1 percent fine dark yellowish brown (10YR 4/6) masses of manganese with sharp boundaries lining pores; slightly effervescent; moderately alkaline; clear wavy boundary.

Btk2—145 to 188 centimeters (57 to 74 inches); light gray (2.5Y 7/2) sandy clay loam, light brownish gray (2.5Y 6/2), moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse angular blocky; very firm, moderately hard, moderately sticky, moderately plastic; common very fine roots; 10 percent distinct pressure faces; 15 percent faint light brownish gray (2.5Y 6/2) clay films on all faces of peds; 1 percent fine distinct dark yellowish brown (10YR 4/4) masses of iron-manganese with sharp boundaries in matrix; 2 percent fine prominent black (10YR 2/1) masses of manganese with sharp boundaries in matrix; 7 percent fine threadlike masses of calcium carbonate; 5 percent medium nodules of calcium carbonate embedded in masses of calcium carbonate; 10 percent medium and coarse masses of calcium carbonate; very slightly effervescent; moderately alkaline; gradual wavy boundary.

Btk3—188 to 203 centimeters (74 to 80 inches); light gray (2.5Y 7/2) loam, light brownish gray (2.5Y 6/2), moist; moderate coarse prismatic structure parting to moderate medium and coarse angular blocky structure; very firm, moderately hard, moderately sticky, moderately plastic; 5 percent distinct pressure faces; 20 percent distinct light brownish gray (2.5Y 6/2) clay films on all faces of peds; 1 percent fine and medium distinct dark yellowish brown (10YR 4/4) masses of iron-manganese with clear boundaries infused into matrix along faces of peds; 3 percent fine prominent black (10YR 2/1) masses of manganese with sharp boundaries in matrix; 1 percent medium nodules of calcium carbonate embedded in masses of calcium carbonate; 10 percent medium and coarse masses of calcium carbonate masses; very slightly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 4 to 6
Chroma: 2 or 3
Texture: fine sandy loam
Clay content: 5 to 12 percent
Redox concentrations: amount—0 to 4 percent; shades—brown
Reaction: strongly acid to slightly acid

Upper Bt horizon

Hue: 7.5YR or 10YR
Value: 4 or 5
Chroma: 2 or 3
Texture: sandy clay loam or sandy clay
Clay content: 32 to 45 percent
Redox concentrations: amount—2 to 8 percent; shades—brown or yellow
Iron depletions: amount—0 to 2 percent; shades—gray
Reaction: strongly acid to slightly acid

Lower Bt horizon

Hue: 10YR
Value: 5 or 6
Chroma: 1 or 2
Texture: sandy clay loam
Clay content: 22 to 32 percent
Redox concentrations: amount—2 to 15 percent; shades—red, brown, or yellow
Iron depletions: amount—0 to 4 percent; shades—gray
Reaction: slightly acid to slightly alkaline

Btk horizon

Hue: 10YR or 2.5Y
Value: 5 to 7
Chroma: 1 or 2
Texture: sandy clay loam or loam
Clay content: 22 to 32 percent
Redox concentrations: amount—2 to 15 percent; shades—brown or yellow
Iron depletions: amount—0 to 2 percent; shades—gray
Calcium carbonate equivalent: 1 to 15 percent
Identifiable secondary calcium carbonate: amount—5 to 15; size—fine to coarse; kind—masses or nodules
Effervescence: none to slight
Reaction: slightly alkaline or moderately alkaline

Zalco Series

The Zalco series consists of very deep, somewhat excessively drained soils that formed in sandy alluvium of Holocene age. These nearly level soils are on natural levees of streams. Slope is 0 to 1 percent. Soils of the Zalco series are sandy, siliceous, hyperthermic Typic Udifluvents.

Typical pedon of Zalco sand in an area of Zalco sand, 0 to 1 percent slopes, frequently flooded; from the intersection of U.S. Highway 59 and Farm Road 2987 in Fannin, 5.6 miles north on Farm Road 2987 to Abrameit Road, 0.4 mile west on Abrameit Road to private road, 0.7 mile south on private road, and 200 feet southeast along creek in rangeland. Schroeder USGS topographic quadrangle; Latitude: 28 degrees, 45 minutes, 51.22 seconds North; Longitude: 97 degrees, 13 minutes, 22.58 seconds West; NAD 83.

A—0 to 15 centimeters (0 to 6 inches); yellowish brown (10YR 5/4) sand, light yellowish brown (10YR 6/4), dry; single grain; loose, loose; common fine roots and many very fine roots; moderately alkaline; clear smooth boundary.

C1—15 to 46 centimeters (6 to 18 inches); light yellowish brown (10YR 6/4) sand, very pale brown (10YR 7/4), dry; single grain; loose, loose; common fine roots and very fine roots; moderately alkaline; gradual smooth boundary.

C2—46 to 72 centimeters (18 to 28 inches); brown (10YR 5/3) loamy fine sand, brown (10YR 5/3), dry; single grain; loose, loose; common very fine roots; slightly alkaline; gradual smooth boundary.

C3—72 to 131 centimeters (28 to 52 inches); very pale brown (10YR 7/3) fine sand, very pale brown (10YR 8/3), dry; single grain; loose, loose; common very fine roots; strongly alkaline; clear smooth boundary.

C4—131 to 203 centimeters (52 to 80 inches); light brown (7.5YR 6/3) coarse sand, pink (7.5YR 7/3), dry; single grain; loose, loose; common very fine roots; strongly alkaline.

A Horizon

Hue: 10YR
Value: 4 to 6
Chroma: 2 to 4
Texture: sand, fine sand, or loamy fine sand
Effervescence: none to slight
Reaction: neutral to moderately alkaline

C Horizon

Hue: 10YR
Value: 4 to 7
Chroma: 2 to 4
Texture: sand, fine sand, or loamy fine sand
Other features: Some pedons have a few thin strata of gravel mainly below the control section.
Effervescence: none to slight
Reaction: neutral to moderately alkaline

Zunker Series

The Zunker series consists of very deep, well drained, moderately rapid permeable soils that formed in calcareous loamy alluvial deposits. These nearly level soils are on crevasse fillings. Slope is 0 to 1 percent. Soils of the Zunker soils are coarse-loamy, siliceous, superactive, hyperthermic Fluventic Haplustepts.

Typical pedon of Zunker fine sandy loam in an area of Zunker fine sandy loam, 0 to 1 percent slopes, occasionally flooded; from the intersection of Texas Highway 239 and Farm Road 2441 south of Goliad, 10.1 miles east on Texas Highway 239 to private road, and 1.3 miles north on private road in pastureland. Lott Lake USGS topographic quadrangle; Latitude: 28 degrees, 36 minutes, 30.4 seconds North; Longitude: 97 degrees, 14 minutes, 5.9 seconds West; NAD 83.

A—0 to 15 centimeters (0 to 6 inches); dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2), moist; weak medium granular structure; soft, friable; common very fine roots; 1 percent fine shell fragments; slightly effervescent; moderately alkaline; clear smooth boundary.

Bw1—15 to 31 centimeters (6 to 12 inches); grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2), moist; weak fine subangular blocky structure; soft, friable; common very fine roots; 1 percent fine shell fragments; slightly effervescent; moderately alkaline; clear smooth boundary.

Bw2—31 to 74 centimeters (12 to 29 inches); light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4), moist; weak medium subangular blocky structure; soft, friable; common very fine roots; 1 percent fine shell fragments; slightly effervescent; moderately alkaline; gradual smooth boundary.

Bw3—74 to 104 centimeters (29 to 41 inches); very pale brown (10YR 7/4) fine sandy loam, light yellowish brown (10YR 6/4), moist; weak medium subangular blocky structure; soft, friable; common very fine roots; 1 percent fine shell fragments; slightly effervescent; moderately alkaline; gradual smooth boundary.

Bw4—104 to 147 centimeters (41 to 58 inches); pale brown (10YR 6/3) loam, brown (10YR 5/3), moist; weak medium subangular blocky structure; slightly hard, friable; common very fine roots; 1 percent fine shell fragments; violently effervescent; moderately alkaline; gradual smooth boundary.

Bw5—147 to 196 centimeters (58 to 77 inches); very pale brown (10YR 7/3) fine sandy loam, pale brown (10YR 6/3), moist; weak medium subangular blocky structure; slightly hard, friable; common very fine roots; 1 percent fine faint dark brown (10YR 3/3) iron-manganese masses with sharp boundaries on faces of peds; 1 percent fine shell fragments; violently effervescent; moderately alkaline; clear smooth boundary.

Ab—196 to 203 centimeters (77 to 80 inches); dark grayish brown (10YR 4/2) clay loam, dark grayish brown (10YR 4/2), moist; massive; hard, firm; common very fine roots; 1 percent fine distinct yellowish brown (10YR 5/6) masses of oxidized iron with sharp boundaries; 1 percent fine faint dark brown (10YR 3/3) iron-manganese masses with sharp boundaries on faces of peds; 1 percent fine shell fragments; moderately alkaline; violently effervescent.

A Horizon

Hue: 10YR
Value: 4 or 5
Chroma: 2 to 4
Texture: fine sandy loam
Clay content: 3 to 20 percent
Effervescence: slight or strong

Bw Horizon

Hue: 10YR
Value: 4 to 7
Chroma: 2 to 4
Texture: loam, fine sandy loam, loamy fine sand, or fine sand that are from 0.6 to 8 centimeters (1/4 to 3 inches) thick and range from a few to many in most pedons.
Redox concentrations: amount—0 to 2; shades—brown

Coarse fragments: none to few snail shell fragments
Effervescence: slight to violent

Ab Horizon

Hue: 10YR
Value: 3 to 5
Chroma: 1 to 4
Texture: loamy fine sand, fine sandy loam, loam, or clay loam (loam or clay loam layers are below the control section)
Coarse fragments: none to few snail shell fragments
Redox concentrations: amount—0 to 2; shades—brown
Identifiable secondary calcium carbonate: none to few films and threads of calcium carbonate
Effervescence: slight to violent

Formation of the Soils

In this section the factors of soil formation are related to the formation of the soils in Goliad County. Also, processes of horizon differentiation and the surface geology of the county are described.

Factors of Soil Formation

Soil is produced by the action and interaction of soil-forming factors on material deposited or accumulated by geologic processes. The characteristics of the soil at any given point are determined by the physical and mineralogical composition of the parent material, the climate under which the soil material accumulated and existed since accumulation, the plant and animal life on and in the soil, the relief or lay of the land, and the length of time these forces have acted on the soil material. One factor, or more, may be dominant in a particular area; consequently, soils differ from place to place. The interaction among the five factors is complex, continuous and so 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 four. Each factor is discussed separately, however, and the probable effects of each are indicated.

Climate

Goliad County has a subtropical climate. Winters are mild and dry, and summers are hot and humid. Rainfall, evaporation, temperature, wind, and length of growing season are some of the climatic factors that directly affect soil formation through weathering, leaching of carbonates, downward movement of clay particles, reduction and movement of iron, and rate of erosion, Climate also determines the kind and amount of plant and animal life that exist on and in the soil.

Rainfall is the dominant climatic factor for Goliad County. Rainfall leaches minerals from the upper soil layers and deposits them in lower ones. Calcium carbonate is a mineral that is easily dissolved in water and moves with the water by gravity into a lower part of the soil. These accumulations of calcium carbonate, termed calcic horizons, are readily seen at lower depths in soils such as Papalote and Weesatche. Clay minerals become dispersed into the soil and water solution as well. The clays eventually accumulate at some depth and can be seen as zones of increased clay content, known as argillic horizons. The Blanconia, Milby, Raisin, Runge, Sarco, Telferner, Vidauri, and Wyick soils are examples of soils with argillic horizons.

Goliad County's mild, dry winters and hot, humid summers assist in the formation of soil features. During wet periods, spring and fall, salts become dissolved in the water and move by gravity to a lower depth. The salts precipitate once the soils dry out. The Greta and Imogene soils have salt accumulations that fluctuate in concentration during wet and dry cycles.

Wind also affects the formation of soils in the county by dislodging soil particles on the ground and transporting them to another location. The Cieno soils are depressions that were formed in part by wind scooping soil particles out of a low area and Kuy, Milby, Nusil, and Rhymes soils are ones that were formed by wind deposition.

Living Organisms

Plants, insects, earthworms, animals, microorganisms, other organisms, and more recently, human beings, contribute to the development of soil. Living organisms cause gains in organic matter and nitrogen in soils, gains or losses in plant nutrients, and changes in soil structure and soil porosity.

Plants play a major role in soil formation in Goliad County. The fibrous root system of grasses contributes a large amount of organic matter to the soils. Roots of grasses, shrubs, and trees decay and leave holes and pores in the soil that serve as passageways for air and water.

Earthworms, insects, rodents, and other animals mix the soil. Worms and insects hasten the decay of organic matter and their tunnels improve soil structure and facilitate the movement of air and water throughout the soil. The decomposed organic matter adds humus to the soil and improves fertility and tilth. These soils have a dark colored surface. The Ander, Buchel, Coy, Dacosta, Elmendorf, Faddin, Inari, Laewest, Monteola, Meguin, Olmedo, Parrita, Pernitas, Runge, Sarnosa, Sinton, and Weesatche soils have dark colored soils because of the accumulation of decomposed organic matter.

People also influence soil formation. The increased traffic by man on soils can cause compaction and leave areas bare where plants cannot grow. They change the makeup of the plant community by bringing in cattle to graze or change the soil structure by plowing and planting crops. These activities can result in a reduction of aeration, infiltration, and permeability, which increases runoff and erosion. These actions have a definite influence on soil genesis; however, the effects may not be apparent for a long time. Some areas of the Weesatche and Raisin soils have eroded surfaces because of the influence of man’s activities.

Relief

Relief, or topography, influences soil development by affecting drainage, runoff, erosion, plant cover, and soil temperature.

The relief in Goliad County ranges from nearly level to gently rolling. Soil profile development depends on the amount of moisture and the depth to which moisture penetrates. Sloping soils take in less water and normally have a less developed profile than nearly level soils. Many of the more sloping soils erode almost as fast as they form. Sarnosa and Colibro are sloping soils without a well developed profile. Nearly all rainfall tends to infiltrate into the soil on nearly level soils. These soils have well developed features. The Faddin, Greta, Inari, Sarco, Telferner, Vidauri, and Wyick are soils on nearly level surfaces and have well developed profiles.

Time

A great length of time is required for soils to form distinct horizons. The differences in the length of time that the parent material has been in place are commonly reflected in the degree of development of soil horizons.

The soils in Goliad County range from young to old. Young soils have very little horizon development and old soils have well developed horizons. Soils on flood plains are young as new sediments are deposited each time a flood occurs. The Meguin, Odem, Sinton, Zalco, and Zunker are on flood plains and are young. Old soils have well developed soil features.

Some older soils have a noticeable accumulation of calcium carbonate in the lower part of the profile. Aging causes the calcium carbonate to leach from the upper horizons to lower horizons; the calcium carbonate is deposited in the form of soft masses or nodules. Pernitas, Weesatche, and Runge soils are examples of soils that have calcium carbonate in the lower horizons. Some soils have a concentration of calcium carbonate in the lower horizons that, after a great length of time, have become cemented or indurated, a petrocalcic horizon. The Goliad, Olmedo, and Parrita soils have a petrocalcic horizon.

Another indication of an old soil is an accumulation of clay. Over time, clay particles are transported by water from the upper part of the soil to the lower part. This accumulation of clay is identified as an argillic horizon. Soils with a well developed argillic horizon include Faddin, Greta, Leming, Papalote, Raisin, Runge, Telferner, Weesatche, Wyick, and Vidauri.

Parent Material

Parent material is the unconsolidated mass from which a soil forms. It determines the chemical and mineral composition of the soil. The soils in Goliad County formed in parent material derived from two geologic systems, the Tertiary and Quaternary. The geology of Goliad County is discussed in more detail under the heading, "Surface Geology."

Deposits of the Tertiary system are sediments of the Goliad and Fleming Formations. The sediments consist of sandstones with interbedded clay. The soils derived from these sediments can range from being loamy throughout, clayey throughout, to loamy or sandy surfaces over clayey or loamy subsoils. The Ander, Papalote, and Weesatche soils are examples of very deep soils that formed in the Goliad Formation. Olmedo and Parrita are shallow soils that formed in the Goliad Formation. Coy, Monteola, and Pernitas are the dominant very deep soils that formed in the Fleming Formation.

Deposits of the Quaternary system are sediments of the Beaumont and Lissie Formations and from stream terraces and recent alluvium. The sediments consist of clays, loams, and sands. Many of these deposits have been reworked by wind and water. Soils of the Beaumont Formation can be clayey throughout or have a loamy surface over clayey subsoil. Soils that formed in the Beaumont Formation are the Contee, Dacosta, Edna, Faddin, Laewest, and Telferner soils. Soils that formed in the Lissie Formation are loamy throughout and include the Greta, Inari, Vidauri, and Wyick. The terrace soils have a loamy or sandy surface layer over clayey or loamy subsoil. These soils are very deep. The Blanconia, Kuy, Leming, Milby, Nusil, and Rhymes soils are terrace soils. The recent alluvium, flood plain soils, can be sandy, loamy, or clayey throughout and are very deep. The Zalco soils are sandy throughout. The Meguin, Odem, and Sinton soils are loamy, while the Buchel soils are clayey throughout.

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. (Soil Survey Staff, 1998) 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 one or more of these horizons.

The A horizon is the surface layer. It is composed of mostly minerals and has the maximum amount of biotic activity and accumulation of organic matter. Biotic activity includes root systems, earthworms, burrowing mammals, crawfish, and microorganisms.

Organic matter is the accumulation of partially decomposed plant and animal material that has been incorporated into the soil. Many of the more stable products of organic matter decomposition remain as finely divided materials, humus, that result in darker colors, increased water-holding and cation-exchange capacities, and granulation of the soil. The Ander, Faddin, Inari, Parrita, Pernitas, Runge, and Weesatche soils have a dark A horizon because of high levels of humus. The Blanconia, Papalote, Raisin, Telferner, Vidauri, and Wyick soils have light colored A horizons because of a low amounts of humus.

The E horizon is the subsurface layer. It is directly below the A horizon. This horizon is absent in most of the soils in Goliad County. It is characterized by the loss of certain materials by leaching. 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. The Leming, Kuy, Milby, Nusil, Raisin, and Rhymes soils have E horizons.

The B horizon is the subsoil. It is directly below the A or E horizons. Some younger soils in Goliad County do not have a B horizon. 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 or color than that of the overlying horizons but shows little evidence of clay translocation or accumulation.

A B horizon that has a significant amount of clay accumulation is called an argillic horizon. A Bt is used to identify this 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. Over time, it accumulates in fine pores in the soil and as clay films on surfaces of peds. The Blanconia, Papalote, Raisin, Telferner, Vidauri, and Wyick soils have an argillic horizon. An argillic horizon with an accumulation of sodium is known as a natric horizon and is identified as Btn. Soils with natric horizons tend to be hard and massive when dry and the high sodium levels damage plant growth. The Greta and Imogene soils have a natric horizon.

A B horizon that has distinct structure or color development with little or no evidence of clay accumulation is called a cambic horizon. It is identified as 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. The Meguin and Odem soils have a cambic horizon.

Some soils in Goliad County have a high amount of smectitic clay, 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. 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. Because of overburden pressure, soil movement, and stress caused by wetting and drying, a platy and wedge-like structure is formed. Thus, the individual structural aggregates have distinct cleavage planes and polished faces known as slickensides. When these slickensides occur the horizon is labeled with a Bss. Buchel, Laewest, and Monteola are soils that have Bss horizons.

A B horizon that has an accumulation of pedogenic calcium carbonate is known as a calcic horizon and is identified with a Bk. In these soils, dissolved calcium carbonate was translocated by water from one part of the soil profile to another. As the soil dries, the dissolved calcium carbonate precipitates as masses and nodules. The Colibro, Pernitas, Runge, and Weesatche soils have Bk horizons. In some soils, the accumulation of calcium carbonate has become cemented. These cemented accumulations of calcium carbonate are known as petrocalcic horizons and is identified with a Bkm. The Goliad, Olmedo, and Parrita soils have a Bkm horizon.

A B horizon that has undergone the reduction of iron because of prolonged periods of saturation is a gleyed horizon and is identified as Bg. In these soils, microbes have used all available oxygen and have converted to the use of iron in order to metabolize organic carbon. When this occurs, the iron reduces and becomes mobile in the saturated zone. As iron leaves an area in the soil, the iron free soil color is gray. Once the iron comes into contact with oxygen, it precipitates. These areas show up as red, brown, or yellow mottles known as iron accumulations. The Cieno soils have Bg horizons with iron accumulations.

The C horizon is relatively unchanged by soil-forming processes, although in some places it is modified by weathering. In most cases, the C horizon is below the B horizon. Soils with a C horizon in Goliad County do not have an overlying B horizon but start immediately below the A horizon. These soils are found along active flood plains and have not had a long enough time to form a B horizon. The Zalco soils have a C horizon.

Surface Geology

Prepared by Nelson A. Rolong, USDA NRCS Soil Scientist

Goliad County is in the West Gulf Geomorphic Region where all of the geologic units dip gulfward (Walker and Coleman, 1987). The geologic formations include the Lissie and Beaumont Formations of Pleistocene age, the Goliad Formation of Pliocene age, and the Fleming Formation of Miocene age. These formations are overlain by younger Holocene age and Pleistocene age fluvial and eolian deposits. The orientation of the younger deposits, in most places, is oblique to or perpendicular to the outcrop patterns of the older formations. Most of the county falls in the drainage basin of the southeastward-flowing San Antonio River. The extreme northeastern part of the county is in the Coleto Creek drainage basin which eventually flows into the Guadalupe River drainage basin. The southwestern part of the county is in the Blanco Creek drainage basin. This creek flows into the Mission River. The general soil map can serve as an approximate guide to the geology of the county.

Goliad Formation

The Goliad Formation of Pliocene age is the most extensive geologic formation in the county. It overlies the older Fleming Formation (Solis, 1981). The terrain is highly dissected by erosion into resistant ridges and valleys. It is predominantly rangeland but some areas are in pastureland and cropland. The formation is situated from the southwest to the northwest. The Goliad Formation is fluvial in origin, with the paleo-Blanco and paleo-San Antonio Rivers as its probable source. The formation is characterized by sand and sandstone interbedded with clay and gravel. The Goliad Formation’s dominant feature is a thick deposit of caliche that caps the sandstone. The Weesatche-Ander-Clareville and Papalote-Weesatche-Raisin general soil map units are mostly within the Goliad Formation.

Fleming Formation

The Fleming Formation of Miocene age is generally located in the northwestern part of the county. Small areas of the Fleming Formation outcrop along naturally occurring erosional areas associated with major drainageways. It represents the oldest formation in the county. The terrain is rolling hills and valleys formed by natural erosion. It is predominantly rangeland but some areas are in pastureland and cropland. The formation is fluvial in origin, with the paleo-Blanco and paleo-San Antonio Rivers as its probable source (Solis, 1981). The Fleming Formation is characterized by massive calcareous sandstone similar to the Goliad Formation, but the Fleming Formation contains more clay (Solis, 1981). The Monteola-Clareville-Pernitas general soils map unit is mostly within the Fleming Formation.

Lissie Formation

The Lissie Formation of Pleistocene age is generally located from the southwest to the south central part of the county. It overlies the older Goliad Formation. The terrain is nearly flat with some relief along drainageways. It is predominantly rangeland with small areas of pastureland. The Lissie Formation is of interglacial fluviodeltaic in origin and is characterized by thick beds of clay, silt, and sand (Bernard and LeBlanc, 1965). The uneroded surface has been sufficiently modified by wind action to remove any indications of its fluviatile nature (USDA-SCS, 1979). The Wyick-Sarco-Vidauri general soil map unit is mostly within the Lissie Formation.

Beaumont Formation

The Beaumont Formation of Pleistocene age is generally located in the eastern part of the county from the town of Fannin to the San Antonio River. It overlies the older Lissie Formation. The terrain is nearly flat with some relief along drainageways. The dominant land uses are cropland and rangeland. The Beaumont Formation is of interglacial fluviodeltaic in origin and characterized by thick beds of clay, silt and sand much like the underlying Lissie Formation (Bernard and LeBlanc, 1965). The Beaumont Formation differs with the Lissie Formation in that some resemblance of the original fluviatile surface is still visible in the form of meander belts and flood basins. In addition, the soils tend to have more clay than the older Lissie Formation. The Telferner-Laewest-Edna general soils map is mostly within the Beaumont Formation.

Recent Alluvium

Areas of Holocene age deposits are found mostly along the San Antonio River with minor amounts along Coleto Creek in the northeastern part of the County and Blanco Creek in the southwestern part. These areas are known as the flood plain. It overlies older geologic formations and in many areas still receives deposits of sand, silt, and clay during flood events. The Buchel-Meguin-Sinton general soil map unit is mostly within the Recent Alluvium.

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "National Soil Survey Handbook" (available in local offices of the Natural Resources Conservation Service or on the Internet).

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

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.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction toward which a slope faces. Also called slope aspect.

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

Backslope. The position that forms the steepest and generally linear, middle portion of a hill slope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp. A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

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.

Base slope (geomorphology). A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane. A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle-size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. An informal term loosely applied to various portions of a flood plain.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to 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 general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

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.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

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 millimeters 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 dense, compact, slowly permeable subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. A claypan is commonly hard when dry and plastic and sticky 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.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

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.

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 compounds making up concretions. See Redoximorphic features.

Conglomerate. A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

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 (geomorphology). A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations). 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.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

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.

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.

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.

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw. A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Earthy fill. See Mine spoil.

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 and/or proportion of species or in 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 deposit. Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

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.

Erosion surface. A land surface shaped by the action of erosion, especially by running water.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

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.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms. A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay. A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step. An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial. Of or pertaining to rivers or streams; produced by stream or river action.

Footslope. The concave surface at the base of a hill slope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

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 (microbasins) and microhighs (microknolls) 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.

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 caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. 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.

Hard to reclaim (in tables)**.** Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

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 slope (geomorphology). A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

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 generic term for an elevated area 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. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hill slope. A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

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:

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.

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 plant community 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

Interfluve. A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology). A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream. A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or 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 plant community has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. See Redoximorphic features.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Lamella. A thin, discontinuous or continuous, generally horizontal layer of fine material (especially clay and iron oxides) that has been illuviated within a coarser, eluviated layer.

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.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. 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. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

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.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

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. See Redoximorphic features.

Meander belt. The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar. A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll. One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

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.

Mine spoil. An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

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. A kind of map unit 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).

Mudstone. A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

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.

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. See Redoximorphic features.

Nose slope (geomorphology). A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

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.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three-dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The 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:

Impermeable	less than 00.0015 inch
Very slow	00.0015 to 00.06 inch
Slow	00.06 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.

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.

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.

Pore linings. See Redoximorphic features.

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.

Precipitation Effectiveness Index (P-E Index) is the measure of the long-range effectiveness of precipitation in promoting plant growth for a given location. The formula for calculating PE Index is:

$$\text{P-E Index} = 10 \sum_{n-1}^{12} (\text{P-E index})_n$$

The formula is equal to 10 times the sum of the monthly precipitation-evaporation ratios (monthly precipitation amounts divided by monthly evaporation amounts).

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.

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. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   a. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; and
   b. Masses, which are noncemented concentrations of substances within the soil matrix; and
   c. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   a. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; and
   b. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).

3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix. See Redoximorphic features.

Regolith. All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill. A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser. The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

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.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saturated hydraulic conductivity (K_{sat}). See Permeability.

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.

Sedimentary rock. A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

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.

Shale. Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The convex, erosional surface near the top of a hill slope. A shoulder is a transition from summit to backslope.

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.

Shrub-coppice dune. A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

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

Siltstone. An indurated silt having the texture and Composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

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

Slickensides (pedogenic). Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

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
Very gently sloping	1 to 3 percent
Gently sloping	3 to 5 percent
Moderately sloping	5 to 8 percent
Strongly sloping	8 to 12 percent
Moderately steep	12 to 20 percent
Steep	20 to 45 percent

Slope alluvium. Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

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

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

Sodium adsorption ratio (SAR). 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.

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.

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.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

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 grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind 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. Any surface soil horizon (A, E, AB, or EB) below the 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.

Summit. The topographically highest position of a hill slope. It has a nearly level (planar or only slightly convex) surface.

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.

Terrace (conservation). An embankment, or ridge, constructed across sloping soils are 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 (geomorphology). A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes. Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

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.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The gently inclined surface at the base of a hill slope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hill slope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread. The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Upland. An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hill slope continuum.

Underlying material. The part of the soil below the solum.

Valley fill. The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Weathering. All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered 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.

Tables

Table 1.--Temperature and Precipitation

(Recorded for the period 1971-2000 at Beeville, Texas)

Month	Temperature (Degrees F)						Precipitation (Inches)			
				2 years in 10 will have		Average number of growing degree days*		2 years in 10 will have		Average number of days w/0.1 or more
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than	Minimum temperature less than		Average	less than	more than	
January	64.5	43.1	53.8	85	21	207	1.94	0.55	3.06	4
February	68.2	46.5	57.4	89	24	237	1.84	0.49	2.92	3
March	75.2	53.9	64.6	93	30	453	1.90	0.49	3.03	3
April	80.7	59.8	70.3	96	37	607	2.68	0.63	4.30	4
May	86.1	67.4	76.8	97	50	829	3.49	1.08	5.50	5
June	91.3	71.9	81.6	101	59	948	4.19	1.04	6.75	5
July	94.6	73.1	83.9	102	66	1,049	2.69	0.27	4.46	4
August	94.6	72.8	83.7	102	66	1,044	3.02	0.75	4.83	4
September	90.7	69.0	79.9	101	50	896	4.30	1.27	6.76	5
October	83.4	60.5	72.0	95	40	680	3.60	0.90	5.74	5
November	73.8	52.1	63.0	89	29	398	2.00	0.65	3.11	3
December	66.6	44.8	55.7	85	21	232	1.83	0.40	2.96	3
Yearly:										
Average	80.8	59.6	70.2	---	---	---	---	---	---	---
Extreme	110	8	---	105	17	---	---	---	---	---
Total	---	---	---	---	---	7,580	33.48	25.68	40.83	48

*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 Spring and Fall

(Recorded for the period 1971-2000 at Beeville, Texas)

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	February 18	March 2	March 17
2 years in 10 later than--	February 5	February 19	March 7
5 years in 10 later than--	January 9	January 28	February 16
First freezing temperature in fall:			
1 year in 10 earlier than--	December 6	November 21	November 16
2 years in 10 earlier than--	December 16	December 1	November 22
5 years in 10 earlier than--	January 4	December 21	December 5

Table 3.--Growing Season

(Recorded for the period 1971-2000 at Beeville, Texas)

Probability	Daily Minimum Temperature		
	Number of days higher than 24°F	Number of days higher than 28°F	Number of days higher than 32°F
	Days	Days	Days
9 years in 10	312	290	257
8 years in 10	326	302	268
5 years in 10	359	326	290
2 years in 10	---	---	313
1 year in 10	---	---	332

Table 4.--Temperature and Precipitation

(Recorded for the period 1971-2000 at Victoria, Texas)

Month	Temperature (Degrees F)						Precipitation (Inches)			
				2 years in 10 will have		Average number of growing degree days*		2 years in 10 will have		Average number of days w/0.1 or more
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than	Minimum temperature less than		Average	less than	more than	
January	62.8	43.6	53.2	83	21	197	2.44	0.65	3.88	4
February	66.6	46.7	56.7	86	25	244	2.04	0.58	3.22	4
March	73.4	53.9	63.7	91	31	448	2.25	0.66	3.54	3
April	79.2	60.1	69.7	91	39	604	2.97	0.50	4.87	4
May	85.1	68.1	76.6	95	53	835	5.12	1.14	8.24	5
June	90.3	73.3	81.8	98	62	964	4.96	1.26	7.94	6
July	93.4	75.0	84.2	100	68	1,067	2.90	0.51	4.73	4
August	93.7	74.6	84.2	102	68	1,063	3.05	1.54	4.37	5
September	89.9	70.3	80.1	100	50	904	5.00	2.13	7.44	6
October	83.0	61.6	72.3	94	41	693	4.26	1.28	6.68	5
November	73.0	52.3	62.7	88	30	396	2.64	0.65	4.22	4
December	65.2	45.2	55.2	83	22	232	2.47	0.95	3.75	4
Yearly:										
Average	79.6	60.4	70.0	---	---	---	---	---	---	---
Extreme	111	9	---	103	18	---	---	---	---	---
Total	---	---	---	---	---	7,647	40.10	31.12	48.56	54

*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 5.--Freeze Dates in Spring and Fall

(Recorded for the period 1971-2000 at Victoria, Texas)

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	February 8	February 24	March 8
2 years in 10 later than--	January 29	February 13	February 26
5 years in 10 later than--	January 5	January 20	February 9
First freezing temperature in fall:			
1 year in 10 earlier than--	December 12	December 1	November 16
2 years in 10 earlier than--	December 22	December 8	November 24
5 years in 10 earlier than--	January 14	December 25	December 11

Table 6.--Growing Season

(Recorded for the period 1971-2000 at Victoria, Texas)

Probability	Daily Minimum Temperature		
	Number of days higher than 24°F	Number of days higher than 28°F	Number of days higher than 32°F
	Days	Days	Days
9 years in 10	319	299	271
8 years in 10	333	312	282
5 years in 10	> 365	340	305
2 years in 10	---	---	330
1 year in 10	---	---	349

Table 7.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AnA	Ander fine sandy loam, 0 to 1 percent slopes	9,454	1.7
AnB	Ander fine sandy loam, 1 to 3 percent slopes	26,715	4.9
BnB	Blanconia loamy fine sand, 0 to 2 percent slopes	21,313	3.9
BsA	Buchel clay, 0 to 1 percent slopes, occasionally flooded	9,328	1.7
BuA	Buchel clay, 0 to 1 percent slopes, frequently flooded	5,220	0.9
CnA	Cieno loam, 0 to 1 percent slopes	664	0.1
CrA	Clareville sandy clay loam, 0 to 1 percent slopes, rarely flooded	17,156	3.1
CrB	Clareville sandy clay loam, 1 to 3 percent slopes, rarely flooded	13,238	2.4
CsC	Colibro sandy clay loam, 3 to 5 percent slopes	2,751	0.5
CsD	Colibro loam, 5 to 12 percent slopes	1,881	0.3
CyB	Coy clay loam, 1 to 3 percent slopes	4,763	0.9
CyC	Coy clay loam, 3 to 5 percent slopes	339	*
DaA	Dacosta sandy clay loam, 0 to 1 percent slopes	1,266	0.2
DAMS	Dams	2	*
DcA	Dacosta-Contee complex, 0 to 1 percent slopes	580	0.1
DeC	Devine very gravelly fine sandy loam, 1 to 5 percent slopes	436	*
DUMPS	Dumps	211	*
EbA	Edna fine sandy loam, 0 to 1 percent slopes	1,970	0.4
EdA	Edroy clay, 0 to 1 percent slopes	393	*
EnB	Elmendorf-Denhawken complex, 1 to 3 percent slopes	2,721	0.5
FdA	Faddin fine sandy loam, 0 to 1 percent slopes	903	0.2
GdB	Goliad fine sandy loam, 1 to 3 percent slopes	5,990	1.1
GoB	Goliad sandy clay loam, 1 to 3 percent slopes	2,762	0.5
GrA	Greta fine sandy loam, 0 to 1 percent slopes	13,555	2.5
ImA	Imogene fine sandy loam, 0 to 1 percent slopes	3,642	0.7
InA	Inari fine sandy loam, 0 to 1 percent slopes	3,623	0.7
InB	Inari fine sandy loam, 1 to 3 percent slopes	2,684	0.5
KyB	Kuy fine sand, 1 to 3 percent slopes	1,879	0.3
LaA	Laewest clay, 0 to 1 percent slopes	2,209	0.4
LaB	Laewest clay, 1 to 3 percent slopes	154	*
LaD	Laewest clay, 3 to 8 percent slopes, eroded	20	*
LmB	Leming loamy fine sand, 0 to 3 percent slopes	3,012	0.5
MbB	Milby fine sand, 0 to 2 percent slopes	1,038	0.2
MeA	Meguin silty clay loam, 0 to 1 percent slopes, occasionally flooded	5,083	0.9
MgA	Meguin silty clay loam, 0 to 1 percent slopes, frequently flooded	4,418	0.8
MoA	Monteola clay, 0 to 1 percent slopes	2,871	0.5
MoB	Monteola clay, 1 to 3 percent slopes	3,647	0.7
MoC	Monteola clay, 3 to 5 percent slopes	915	0.2
NuC	Nusil fine sand, 1 to 5 percent slopes	6,486	1.2
OdA	Odem-Riverwash complex, 0 to 1 percent, frequently flooded	5,119	0.9
OmD	Olmedo very gravelly loam, 1 to 8 percent slopes	16,570	3.0
OrA	Orelia fine sandy loam, 0 to 1 percent slopes	2,830	0.5
PaB	Papalote loamy sand, 0 to 3 percent slopes	27,482	5.0
PbA	Papalote fine sandy loam, 0 to 1 percent slopes	8,638	1.6
PbB	Papalote fine sandy loam, 1 to 3 percent slopes	14,501	2.6
PITS	Pits	191	*
PrB	Parrita sandy clay loam, 0 to 3 percent slopes	9,504	1.7
PtC	Pernitas sandy clay loam, 2 to 5 percent slopes	18,906	3.4
PuC	Pettus loam, 2 to 5 percent slopes	1,493	0.3
RaB	Raisin loamy fine sand, 0 to 3 percent slopes	29,281	5.3
RaC	Raisin loamy fine sand, 3 to 5 percent slopes	4,610	0.8
RaC2	Raisin loamy fine sand, 2 to 5 percent slopes, moderately eroded	1,517	0.3
RnB	Raisin fine sandy loam, 1 to 3 percent slopes	4,763	0.9
RoA	Realitos clay, 0 to 1 percent slopes	728	0.1
RsC	Rhymes fine sand, 1 to 5 percent slopes	3,031	0.6
RuB	Runge fine sandy loam, 1 to 3 percent slopes	2,089	0.4
RyA	Rydolph silty clay, 0 to 1 percent slopes, frequently flooded	56	*
ScB	Sarco coarse sand, 0 to 2 percent slopes	33,773	6.1
SnC	Sarnosa fine sandy loam, 1 to 5 percent slopes	5,254	1.0
SnD	Sarnosa fine sandy loam, 5 to 8 percent slopes	2,149	0.4
StC	Schattel sandy clay loam, 1 to 5 percent slopes	1,199	0.2
SwA	Sinton sandy clay loam, 0 to 1 percent slopes, occasionally flooded	5,321	1.0

Table 7.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
TeA	Telferner fine sandy loam, 0 to 1 percent slopes	5,269	1.0
TeB	Telferner fine sandy loam, 1 to 3 percent slopes	510	*
ToA	Tiocano clay, 0 to 1 percent slopes	166	*
UsB	Ustarents, loamy, 0 to 3 percent slopes	112	*
VdA	Vidauri fine sandy loam, 0 to 1 percent slopes	12,270	2.2
VwA	Vidauri-Wyick complex, 0 to 1 percent slopes	23,248	4.2
W	Water	2,227	0.4
WcC	Weesatche fine sandy loam, 2 to 5 percent slopes	11,803	2.1
WeA	Weesatche sandy clay loam, 0 to 1 percent slopes	6,001	1.1
WeB	Weesatche sandy clay loam, 1 to 3 percent slopes	54,612	9.9
WeB2	Weesatche sandy clay loam, 1 to 3 percent slopes, moderately eroded	892	0.2
WeC	Weesatche sandy clay loam, 3 to 5 percent slopes	3,338	0.6
WoA	Woodsboro loam, 0 to 1 percent slopes, rarely flooded	973	0.2
WyA	Wyick fine sandy loam, 0 to 1 percent slopes	34,448	6.3
ZaA	Zalco sand, 0 to 1 percent slopes, occasionally flooded	1,922	0.3
ZcA	Zalco sand, 0 to 1 percent slopes, frequently flooded	2,601	0.5
ZkA	Zunker fine sandy loam, 0 to 1 percent slopes, occasionally flooded	3,090	0.6
ZnA	Zunker fine sandy loam, 0 to 1 percent slopes, frequently flooded	1,757	0.3
	Total	549,536	100.0

* Less than 0.1 percent.

Table 8.--Prime and Other Important Farmland

(Only the soils considered prime or important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map Symbol	Map unit name	Farmland Classification
AnA	Ander fine sandy loam, 0 to 1 percent slopes	All areas are prime farmland
AnB	Ander fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
BsA	Buchel clay, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
CrA	Clareville sandy clay loam, 0 to 1 percent slopes, rarely flooded	All areas are prime farmland
CrB	Clareville sandy clay loam, 1 to 3 percent slopes, rarely flooded	All areas are prime farmland
CyB	Coy clay loam, 1 to 3 percent slopes	All areas are prime farmland
CyC	Coy clay loam, 3 to 5 percent slopes	All areas are prime farmland
DaA	Dacosta sandy clay loam, 0 to 1 percent slopes	All areas are prime farmland
DcA	Dacosta-Contee complex, 0 to 1 percent slopes	All areas are prime farmland
EnB	Elmendorf-Denhawken complex, 1 to 3 percent slopes	All areas are prime farmland
InA	Inari fine sandy loam, 0 to 1 percent slopes	All areas are prime farmland
InB	Inari fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
LaA	Laewest clay, 0 to 1 percent slopes	All areas are prime farmland
LaB	Laewest clay, 1 to 3 percent slopes	All areas are prime farmland
MoA	Monteola clay, 0 to 1 percent slo pes	All areas are prime farmland
MoB	Monteola clay, 1 to 3 percent slopes	All areas are prime farmland
MoC	Monteola clay, 3 to 5 percent slopes	All areas are prime farmland
PbA	Papalote fine sandy loam, 0 to 1 percent slopes	All areas are prime farmland
PbB	Papalote fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
PtC	Pernitas sandy clay loam, 2 to 5 percent slopes	All areas are prime farmland
RaB	Raisin loamy fine sand, 0 to 3 percent slopes	All areas are prime farmland
RnB	Raisin fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
RoA	Realitos clay, 0 to 1 percent slopes	All areas are prime farmland
RuB	Runge fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
UsB	Ustarents, loamy, 0 to 3 percent slopes	All areas are prime farmland
WcC	Weesatche fine sandy loam, 2 to 5 percent slopes	All areas are prime farmland
WeA	Weesatche sandy clay loam, 0 to 1 percent slopes	All areas are prime farmland
WeB	Weesatche sandy clay loam, 1 to 3 percent slopes	All areas are prime farmland
WeC	Weesatche sandy clay loam, 3 to 5 percent slopes	All areas are prime farmland
BnB	Blanconia loamy fine sand, 0 to 2 percent slopes	Prime farmland if irrigated
LmB	Leming loamy fine sand, 0 to 3 percent slopes	Prime farmland if irrigated
OdA	Odem-Riverwash complex, 0 to 1 percent, frequently flooded	Prime farmland if irrigated
PaB	Papalote loamy sand, 0 to 3 percent slopes	Prime farmland if irrigated
RaC	Raisin loamy fine sand, 3 to 5 percent slopes	Prime farmland if irrigated
ScB	Sarco coarse sand, 0 to 2 percent slopes	Prime farmland if irrigated
SnC	Sarnosa fine sandy loam, 1 to 5 percent slopes	Prime farmland if irrigated
StC	Schattel sandy clay loam, 1 to 5 percent slopes	Prime farmland if irrigated
WyA	Wyick fine sandy loam, 0 to 1 percent slopes	Prime farmland if irrigated

Table 9.--Land Capability and Non-Irrigated Yields by Map Unit

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. 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	Corn	Grain sorghum	Improved bermudagrass	Kleingrass	Soybeans
		Bu	Bu	AUM	AUM	Bu
AnA:		65.00	40.00	5.00	---	---
Ander--------------------	2e					
AnB:		---	30.00	4.50	---	---
Ander--------------------	2e					
BnB:		60.00	40.00	5.00	---	---
Blanconia----------------	2w					
BsA:		60.00	55.00	5.50	---	---
Buchel-------------------	3s					
BuA:		---	---	5.00	---	---
Buchel-------------------	5w					
CnA:		---	---	6.00	---	---
Cieno--------------------	4w					
CrA:		70.00	55.00	5.00	---	---
Clareville---------------	1					
CrB:		55.00	40.00	---	---	---
Clareville---------------	2e					
CsC:		55.00	40.00	4.00	4.00	---
Colibro------------------	3e					
CsD:		---	---	3.00	3.00	---
Colibro------------------	4e					
CyB:		55.00	60.00	5.00	---	---
Coy----------------------	2e					
CyC:		50.00	55.00	4.50	---	---
Coy----------------------	2e					
DaA:		---	85.00	10.00	6.00	---
Dacosta------------------	2w					
DAMS:		---	---	---	---	---
Dams---------------------	---					
DcA:		---	85.00	10.00	6.00	---
Dacosta------------------	2w					
Contee-------------------	3w					
DeC:		---	---	---	---	---
Devine-------------------	6s					
DUMPS:		---	---	---	---	---
Dumps, dumps-------------	---					
EbA:		50.00	65.00	8.00	---	25.00
Edna---------------------	3w					

Table 9.--Land Capability and Non-Irrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability	Corn	Grain sorghum	Improved bermudagrass	Kleingrass	Soybeans
		Bu	Bu	AUM	AUM	Bu
EdA:		30.00	35.00	4.00	---	---
Edroy-------------------	4w					
EnB:		55.00	40.00	3.00	2.50	---
Elmendorf---------------	2e					
Denhawken---------------	3e					
FdA:		70.00	80.00	8.00	---	---
Faddin------------------	2e					
GdB:		---	35.00	2.50	2.50	---
Goliad------------------	3e					
GoB:		---	35.00	2.50	2.50	---
Goliad------------------	3e					
GrA:		50.00	50.00	6.00	---	---
Greta-------------------	4s					
ImA:		---	25.00	---	---	---
Imogene-----------------	4s					
InA:		70.00	80.00	8.00	---	---
Inari-------------------	1					
InB:		70.00	80.00	8.00	---	---
Inari-------------------	2e					
KyB:		---	---	6.00	---	---
Kuy---------------------	3s					
LaA:		75.00	90.00	9.00	---	30.00
Laewest-----------------	2s					
LaB:		50.00	85.00	9.00	---	25.00
Laewest-----------------	2e					
LaD:		---	---	6.00	---	---
Laewest, eroded---------	4e					
LmB:		---	---	---	---	---
Leming------------------	3e					
MbB:		---	---	6.00	---	---
Milby-------------------	3s					
MeA:		60.00	80.00	6.50	---	---
Meguin------------------	2w					
MgA:		60.00	80.00	6.50	---	---
Meguin------------------	3w					
MoA:		60.00	55.00	3.50	---	---
Monteola----------------	2s					
MoB:		55.00	50.00	3.00	---	---
Monteola----------------	2e					

Table 9.--Land Capability and Non-Irrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability	Corn	Grain sorghum	Improved bermudagrass	Kleingrass	Soybeans
		Bu	Bu	AUM	AUM	Bu
MoC:		---	---	3.00	---	---
Monteola----------------	3e					
NuC:		---	---	3.00	---	---
Nusil-------------------	4e					
OdA:		60.00	45.00	4.00	---	---
Odem--------------------	2s					
Riverwash---------------	5w					
OmD:		---	---	---	---	---
Olmedo------------------	7s					
OrA:		---	---	9.00	---	---
Orelia------------------	2w					
PaB:		60.00	40.00	5.00	---	---
Papalote----------------	3e					
PbA:		70.00	45.00	5.50	---	---
Papalote----------------	2c					
PbB:		65.00	40.00	5.00	---	---
Papalote----------------	2e					
PITS:		---	---	---	---	---
Pits, borrow------------	---					
PrB:		---	25.00	2.00	2.00	---
Parrita-----------------	3e					
PtC:		---	25.00	2.50	2.50	---
Pernitas----------------	3e					
PuC:		---	25.00	---	---	---
Pettus------------------	4e					
RaB:		---	---	2.00	---	---
Raisin------------------	2e					
RaC:		---	---	---	---	---
Raisin------------------	3e					
RaC2:		---	27.00	---	2.00	---
Raisin------------------	4e					
RnB:		65.00	50.00	---	---	---
Raisin------------------	2c					
RoA:		---	---	---	---	---
Realitos----------------	3w					
RsC:		---	---	3.00	---	---
Rhymes------------------	3e					
RuB:		---	---	5.50	---	---
Runge-------------------	2e					

Table 9.--Land Capability and Non-Irrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability	Corn	Grain sorghum	Improved bermudagrass	Kleingrass	Soybeans
		Bu	Bu	AUM	AUM	Bu
RyA:		---	---	8.00	---	---
Rydolph	5w					
ScB:		---	---	5.00	---	---
Sarco	3e					
SnC:		55.00	45.00	5.00	5.00	---
Sarnosa	2e					
SnD:		---	---	5.00	---	---
Sarnosa	3e					
StC:		---	---	2.00	---	---
Schattel	4e					
SwA:		40.00	75.00	6.00	---	---
Sinton	1					
TeA:		---	60.00	8.00	---	---
Telferner	2w					
TeB:		---	50.00	7.00	---	---
Telferner	3e					
ToA:		---	25.00	---	---	---
Tiocano	4w					
UsB:		---	---	---	---	---
Ustarents	4e					
VdA:		50.00	50.00	6.00	---	---
Vidauri	4w					
VwA:		---	---	---	---	---
Vidauri	4w					
Wyick	3w					
W:		---	---	---	---	---
Water	---					
WcC:		55.00	50.00	5.50	---	---
Weesatche	3e					
WeA:		60.00	55.00	6.00	---	---
Weesatche	1					
WeB:		55.00	50.00	6.00	---	---
Weesatche	2e					
WeB2:		50.00	45.00	5.50	---	---
Weesatche, eroded	4e					
WeC:		50.00	45.00	5.50	---	---
Weesatche	3e					
WoA:		---	---	---	---	---
Woodsboro	6s					

Table 9.--Land Capability and Non-Irrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability	Corn	Grain sorghum	Improved bermudagrass	Kleingrass	Soybeans
		Bu	Bu	AUM	AUM	Bu
WyA:		50.00	50.00	6.00	---	---
Wyick	3w					
ZaA:		---	---	6.00	---	---
Zalco	2w					
ZcA:		50.00	---	6.00	---	---
Zalco	3w					
ZkA:		60.00	45.00	3.50	---	---
Zunker	2w					
ZnA:		60.00	45.00	3.50	---	---
Zunker	3w					

Table 10.--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
AnA:				
Ander	Tight Sandy Loam 21-35" PZ	4,800	4,000	2,000
AnB:				
Ander	Tight Sandy Loam 21-35" PZ	4,800	4,000	2,000
BnB:				
Blanconia	Tight Sandy Loam 25-35" PZ	4,500	3,900	2,000
BsA:				
Buchel	Clayey Bottomland 20-35" PZ	5,000	4,000	3,000
BuA:				
Buchel	Clayey Bottomland 20-35" PZ	5,000	4,000	3,000
CnA:				
Cieno	Lowland 35-56" PZ	8,000	6,000	5,000
CrA:				
Clareville	Clay Loam 25-35" PZ	4,000	3,000	2,000
CrB:				
Clareville	Clay Loam 25-35" PZ	4,000	3,000	2,000
CsC:				
Colibro	Gray Sandy Loam 25-35" PZ	4,000	3,500	2,000
CsD:				
Colibro	Gray Sandy Loam 25-35" PZ	4,000	3,500	2,000
CyB:				
Coy	Rolling Blackland 25-35" PZ	4,000	3,500	2,500
CyC:				
Coy	Rolling Blackland 25-35" PZ	4,000	3,500	2,500
DaA:				
Dacosta	Blackland 24-44" PZ	7,000	5,500	4,000
DAMS:				
Dams	---	---	---	---
DcA:				
Dacosta	Blackland 24-44" PZ	7,000	5,500	4,000
Contee	Blackland 24-44" PZ	7,000	5,500	4,000
DeC:				
Devine	Gravelly Ridge 20-35" PZ	3,000	2,200	1,000
DUMPS:				
Dumps, dumps	---	---	---	---
EbA:				
Edna	Claypan Prairie 28-44" PZ	8,000	6,000	5,000
EdA:				
Edroy	Lakebed 25-35" PZ	5,000	4,000	2,500

Table 10.--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
EnB:				
Elmendorf	Blackland 25-35" PZ	4,000	3,500	2,500
Denhawken	Blackland 25-35" PZ	4,000	3,500	2,500
FdA:				
Faddin	Loamy Prairie 28-40" PZ	8,000	6,500	5,000
GdB:				
Goliad	Sandy Loam 25-35" PZ	5,500	4,200	3,000
GoB:				
Goliad	Clay Loam 25-35" PZ	5,000	4,100	3,000
GrA:				
Greta	Salty Prairie 25-35" PZ	4,500	3,000	2,500
ImA:				
Imogene	Tight Sandy Loam 21-35" PZ	4,000	3,200	1,800
InA:				
Inari	Loamy Prairie 28-40" PZ	8,000	6,500	5,000
InB:				
Inari	Loamy Prairie 28-40" PZ	8,000	6,500	5,000
KyB:				
Kuy	Deep Sand 35-42" PZ	4,500	3,250	2,000
LaA:				
Laewest	Blackland 24-44" PZ	9,500	8,000	6,500
LaB:				
Laewest	Blackland 24-44" PZ	9,500	8,000	6,500
LaD:				
Laewest, eroded	Blackland 24-44" PZ	9,500	8,000	6,500
LmB:				
Leming	Loamy Sand 25-35" PZ	4,500	4,000	2,000
MbB:				
Milby	Sandy 25-35" PZ	5,000	3,500	2,500
MeA:				
Meguin	Loamy Bottomland 25-35" PZ	7,500	6,000	4,000
MgA:				
Meguin	Loamy Bottomland 25-35" PZ	7,500	6,000	4,000
MoA:				
Monteola	Blackland 25-35" PZ	4,000	3,500	2,500
MoB:				
Monteola	Rolling Blackland 25-35" PZ	4,000	3,500	2,500
MoC:				
Monteola	Rolling Blackland 25-35" PZ	4,000	3,500	2,500

Table 10.--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
NuC:				
Nusil	Sandy 20-35" PZ	5,000	4,000	2,500
OdA:				
Odem	Loamy Bottomland 25-44" PZ	7,000	6,000	4,000
Riverwash	---	---	---	---
OmD:				
Olmedo	Shallow Ridge 20-25" PZ	2,700	1,800	1,000
OrA:				
Orelia	Loamy Prairie 28-40" PZ	5,000	4,000	2,500
PaB:				
Papalote	Loamy Sand 25-35" PZ	4,500	3,900	2,000
PbA:				
Papalote	Tight Sandy Loam 21-35" PZ	4,800	4,000	2,000
PbB:				
Papalote	Tight Sandy Loam 21-35" PZ	4,800	4,000	2,000
PITS:				
Pits, borrow	---	---	---	---
PrB:				
Parrita	Shallow Sandy Loam 25-35" PZ	3,700	3,000	1,200
PtC:				
Pernitas	Gray Sandy Loam 25-35" PZ	4,500	3,500	2,500
PuC:				
Pettus	Gravelly Ridge 20-35" PZ	3,200	2,700	1,500
RaB:				
Raisin	Loamy Sand 25-35" PZ	4,500	3,800	2,000
RaC:				
Raisin	Loamy Sand 25-35" PZ	4,500	3,800	2,000
RaC2:				
Raisin	Loamy Sand 25-35" PZ	3,500	3,000	1,700
RnB:				
Raisin	Sandy Loam 25-35" PZ	5,400	4,800	3,000
RoA:				
Realitos	Lakebed 20-35" PZ	4,400	3,300	2,200
RsC:				
Rhymes	Sandy 20-35" PZ	5,000	4,000	2,000
RuB:				
Runge	Sandy Loam 25-35" PZ	5,400	4,800	3,000
RyA:				
Rydolph	Loamy Bottomland 25-44" PZ	7,500	6,000	4,000

Table 10.--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
ScB:				
Sarco	Claypan Savannah 28-40" PZ	4,500	3,900	2,000
SnC:				
Sarnosa	Gray Sandy Loam 25-35" PZ	4,500	3,500	2,500
SnD:				
Sarnosa	Gray Sandy Loam 25-35" PZ	4,500	3,500	2,500
StC:				
Schattel	Sloping Clay Loam 20-35" PZ	3,500	2,500	2,000
SwA:				
Sinton	Loamy Bottomland 25-35" PZ	7,000	6,000	4,000
TeA:				
Telferner	Loamy Prairie 44-56" PZ	6,500	5,000	3,500
TeB:				
Telferner	Loamy Prairie 44-56" PZ	6,500	5,000	3,500
ToA:				
Tiocano	Lakebed 20-35" PZ	5,000	4,000	3,000
UsB:				
Ustarents	---	---	---	---
VdA:				
Vidauri	Claypan Prairie 28-44" PZ	6,000	5,000	3,000
VwA:				
Vidauri	Claypan Prairie 28-44" PZ	6,000	5,000	3,000
Wyick	Claypan Prairie 28-44" PZ	5,500	4,500	2,500
W:				
Water	---	---	---	---
WcC:				
Weesatche	Sandy Loam 25-35" PZ	5,600	4,400	3,000
WeA:				
Weesatche	Clay Loam 25-35" PZ	5,800	4,400	3,000
WeB:				
Weesatche	Clay Loam 25-35" PZ	5,800	4,400	3,000
WeB2:				
Weesatche, eroded	Clay Loam 25-35" PZ	5,800	4,400	3,000
WeC:				
Weesatche	Clay Loam 25-35" PZ	5,800	4,400	3,000
WoA:				
Woodsboro	Salty Prairie 25-35" PZ	7,000	5,000	2,000
WyA:				
Wyick	Claypan Prairie 28-44" PZ	5,500	4,500	2,500

Table 10.--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
ZaA:				
Zalco	Sandy Bottomland 35-42" PZ	7,000	5,000	3,000
ZcA:				
Zalco	Sandy Bottomland 35-42" PZ	7,000	5,000	3,000
ZkA:				
Zunker	Loamy Bottomland 25-35" PZ	7,000	5,000	2,000
ZnA:				
Zunker	Loamy Bottomland 25-35" PZ	7,000	5,000	2,000

Table 11.--Grain and Seed Crops, Domestic Grasses, and Irrigated Grain and Seed Crops for Food and Cover for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AnA:							
Ander	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.17	Percs slowly	0.17	Percs slowly	0.17
AnB:							
Ander	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.17	Percs slowly	0.17	Percs slowly	0.17
		Droughty	0.01			Droughty	0.01
BnB:							
Blanconia	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.50	Too sandy	0.50	Droughty	0.29
		Droughty	0.29	Percs slowly	0.17	Percs slowly	0.17
		Percs slowly	0.17				
BsA:							
Buchel	95	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Flooding	0.50	Excess sodium	0.68	Flooding	0.50
		Percs slowly	0.50	Flooding	0.50	Percs slowly	0.50
				Percs slowly	0.50		
BuA:							
Buchel	85	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Flooding	1.00
		Flooding	0.50	Excess sodium	0.68	Too clayey	1.00
		Percs slowly	0.50	Flooding	0.50	Percs slowly	0.50
				Percs slowly	0.50		
CnA:							
Cieno	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	1.00	Percs slowly	1.00	Percs slowly	1.00
CrA:							
Clareville	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.43	Too clayey	0.43	Too clayey	0.43
CrB:							
Clareville	95	Not limited		Not limited		Not limited	
CsC:							
Colibro	85	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Droughty	0.32			Droughty	0.32

Table 11.--Grain and Seed Crops, Domestic Grasses, and Irrigated Grain and Seed Crops for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
CyB:							
Coy	94	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.81	Too clayey	0.81	Too clayey	0.81
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Excess salt	0.12	Excess sodium	0.32	Excess salt	0.12
				Excess salt	0.12		
CyC:							
Coy	85	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Too clayey	0.81	Too clayey	0.81	Too clayey	0.81
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
DaA:							
Dacosta	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
DAMS:							
Dams	100	Not rated		Not rated		Not rated	
DcA:							
Dacosta	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
Contee	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.99	Too clayey	0.99	Too clayey	0.99
		Depth to saturated zone	0.75	Depth to saturated zone	0.75	Depth to saturated zone	0.75
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
DeC:							
Devine	90	Very limited		Somewhat limited		Very limited	
		Droughty	1.00	Too gravelly, cobbly, or stony	0.99	Droughty	1.00
		Too gravelly, cobbly, or stony	0.99	Droughty	0.41	Too gravelly, cobbly, or stony	0.99
DUMPS:							
Dumps, dumps	100	Not rated		Not rated		Not rated	
EbA:							
Edna	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Droughty	0.02			Droughty	0.02
EdA:							
Edroy	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Droughty	0.26			Droughty	0.26

Table 11.--Grain and Seed Crops, Domestic Grasses, and Irrigated Grain and Seed Crops for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
EnB:							
Elmendorf	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Too clayey	0.19	Too clayey	0.19	Too clayey	0.19
Denhawken	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Too clayey	0.31	Too clayey	0.31	Too clayey	0.31
FdA:							
Faddin	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
GdB:							
Goliad	86	Very limited		Very limited		Very limited	
		Droughty	1.00	Potentially or highly erodible	1.00	Droughty	1.00
		HEL wind	1.00	Percs slowly	0.50	HEL wind	1.00
		Potentially or highly erodible	1.00	Droughty	0.13	Potentially or highly erodible	1.00
		Percs slowly	0.50			Percs slowly	0.50
GoB:							
Goliad	95	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Droughty	0.83	Cemented pan	0.61	Droughty	0.83
		Cemented pan	0.61			Cemented pan	0.61
GrA:							
Greta	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Excess sodium	1.00	Depth to saturated zone	1.00
		Percs slowly	1.00	Depth to saturated zone	1.00	Percs slowly	1.00
		Droughty	0.73	Percs slowly	1.00	Droughty	0.73
		Excess Sodium	0.03			Excess Sodium	0.03
ImA:							
Imogene	95	Very limited		Very limited		Very limited	
		HEL wind	1.00	Excess sodium	1.00	HEL wind	1.00
		Percs slowly	1.00	Potentially or highly erodible	1.00	Percs slowly	1.00
		Potentially or highly erodible	1.00	Percs slowly	1.00	Potentially or highly erodible	1.00
		Excess Sodium	1.00	Droughty	0.01	Excess Sodium	1.00
		Droughty	1.00			Droughty	1.00
InA:							
Inari	85	Very limited		Very limited		Very limited	
		Percs slowly	1.00	Percs slowly	1.00	Percs slowly	1.00
InB:							
Inari	85	Very limited		Very limited		Very limited	
		Percs slowly	1.00	Potentially or highly erodible	1.00	Percs slowly	1.00
		Potentially or highly erodible	1.00	Percs slowly	1.00	Potentially or highly erodible	1.00

Table 11.--Grain and Seed Crops, Domestic Grasses, and Irrigated Grain and Seed Crops for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
KyB:							
Kuy	95	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Too sandy	1.00	Too sandy	0.50	Droughty	1.00
		Droughty	1.00	Droughty	0.08	Too sandy	0.50
LaA:							
Laewest	95	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
LaB:							
Laewest	95	Very limited		Very limited		Very limited	
		Too clayey	1.00	Potentially or highly erodible	1.00	Too clayey	1.00
		Potentially or highly erodible	1.00	Too clayey	1.00	Potentially or highly erodible	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
LaD:							
Laewest, eroded	80	Very limited		Very limited		Very limited	
		Too clayey	1.00	Potentially or highly erodible	1.00	Too clayey	1.00
		Potentially or highly erodible	1.00	Too clayey	1.00	Potentially or highly erodible	1.00
		Percs slowly	0.50	Percs slowly	0.50	Slope	0.50
						Percs slowly	0.50
LmB:							
Leming	85	Very limited		Somewhat limited		Very limited	
		HEL wind	1.00	Depth to saturated zone	0.98	HEL wind	1.00
		Droughty	0.99	Too sandy	0.50	Droughty	0.99
		Depth to saturated zone	0.98	Percs slowly	0.33	Depth to saturated zone	0.98
		Too sandy	0.50			Percs slowly	0.33
		Percs slowly	0.33				
MbB:							
Milby	90	Very limited		Somewhat limited		Very limited	
		Too sandy	1.00	Depth to saturated zone	0.75	Droughty	1.00
		Droughty	1.00	Too sandy	0.50	Depth to saturated zone	0.75
		Depth to saturated zone	0.75	Droughty	0.14	Too sandy	0.50
MeA:							
Meguin	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.86	Too clayey	0.86	Too clayey	0.86
		Flooding	0.50	Flooding	0.50	Flooding	0.50
MgA:							
Meguin	95	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.86	Too clayey	0.86	Flooding	1.00
		Flooding	0.50	Flooding	0.50	Too clayey	0.86

Table 11.--Grain and Seed Crops, Domestic Grasses, and Irrigated Grain and Seed Crops for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MoA:							
Monteola	95	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
MoB:							
Monteola	85	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
MoC:							
Monteola	85	Very limited		Very limited		Very limited	
		Too clayey	1.00	Potentially or highly erodible	1.00	Too clayey	1.00
		Potentially or highly erodible	1.00	Too clayey	1.00	Potentially or highly erodible	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
NuC:							
Nusil	90	Very limited		Very limited		Very limited	
		HEL wind	1.00	Potentially or highly erodible	1.00	HEL wind	1.00
		Potentially or highly erodible	1.00	Too sandy	0.50	Potentially or highly erodible	1.00
		Too sandy	1.00	Percs slowly	0.33	Droughty	0.95
		Droughty	0.95			Too sandy	0.50
		Percs slowly	0.33			Percs slowly	0.33
OdA:							
Odem	50	Somewhat limited		Not limited		Somewhat limited	
		Droughty	0.32			Droughty	0.32
Riverwash	45	Not rated		Not rated		Not rated	
OmD:							
Olmedo	90	Very limited		Very limited		Very limited	
		Droughty	1.00	Droughty	1.00	Droughty	1.00
		Cemented pan	1.00	Potentially or highly erodible	1.00	Cemented pan	1.00
		Potentially or highly erodible	1.00	Cemented pan	1.00	Potentially or highly erodible	1.00
		Too gravelly, cobbly, or stony	1.00	Too gravelly, cobbly, or stony	1.00	Too gravelly, cobbly, or stony	1.00
						Slope	0.12
OrA:							
Orelia	90	Very limited		Very limited		Very limited	
		Percs slowly	1.00	Percs slowly	1.00	Percs slowly	1.00
		Droughty	0.10			Droughty	0.10
PaB:							
Papalote	90	Very limited		Somewhat limited		Very limited	
		HEL wind	1.00	Too sandy	0.50	HEL wind	1.00
		Too sandy	0.50	Percs slowly	0.17	Too sandy	0.50
		Percs slowly	0.17			Percs slowly	0.17
		Droughty	0.06			Droughty	0.06

Table 11.--Grain and Seed Crops, Domestic Grasses, and Irrigated Grain and Seed Crops for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
PbA:							
Papalote------------	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.17	Percs slowly	0.17	Percs slowly	0.17
PbB:							
Papalote------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Percs slowly	0.17	Percs slowly	0.17	Percs slowly	0.17
PITS:							
Pits, borrow--------	100	Not rated		Not rated		Not rated	
PrB:							
Parrita-------------	85	Very limited		Very limited		Very limited	
		Droughty	1.00	Potentially or highly erodible	1.00	Droughty	1.00
		HEL wind	1.00	Cemented pan	1.00	HEL wind	1.00
		Cemented pan	1.00	Droughty	0.75	Cemented pan	1.00
		Potentially or highly erodible	1.00			Potentially or highly erodible	1.00
PtC:							
Pernitas------------	85	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
PuC:							
Pettus--------------	85	Very limited		Very limited		Very limited	
		HEL wind	1.00	Potentially or highly erodible	1.00	HEL wind	1.00
		Potentially or highly erodible	1.00	Droughty	0.12	Potentially or highly erodible	1.00
		Droughty	1.00			Droughty	1.00
RaB:							
Raisin--------------	95	Very limited		Very limited		Very limited	
		HEL wind	1.00	Potentially or highly erodible	1.00	HEL wind	1.00
		Potentially or highly erodible	1.00	Too sandy	0.50	Potentially or highly erodible	1.00
		Droughty	0.64			Droughty	0.64
		Too sandy	0.50				
RaC:							
Raisin--------------	95	Very limited		Very limited		Very limited	
		HEL wind	1.00	Potentially or highly erodible	1.00	HEL wind	1.00
		Potentially or highly erodible	1.00	Too sandy	0.50	Potentially or highly erodible	1.00
		Too sandy	0.50			Droughty	0.16
		Droughty	0.16			Slope	0.12
RaC2:							
Raisin--------------	90	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Too sandy	0.50	Too sandy	0.50		

Table 11.--Grain and Seed Crops, Domestic Grasses, and Irrigated Grain and Seed Crops for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover: Rating class and limiting features	Value	Domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Irrigated grain and seed crops for food and cover: Rating class and limiting features	Value
RnB:							
Raisin	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
RoA:							
Realitos	90	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Ponding	0.50	Ponding	0.50	Ponding	0.50
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
RsC:							
Rhymes	95	Very limited		Very limited		Very limited	
		HEL wind	1.00	Potentially or highly erodible	1.00	HEL wind	1.00
		Potentially or highly erodible	1.00	Too sandy	0.50	Potentially or highly erodible	1.00
		Too sandy	1.00	Droughty	0.41	Droughty	1.00
		Droughty	1.00			Too sandy	0.50
RuB:							
Runge	95	Not limited		Not limited		Not limited	
RyA:							
Rydolph	85	Very limited		Very limited		Very limited	
		Excess Sodium	1.00	Excess sodium	1.00	Excess Sodium	1.00
		Too clayey	1.00	Too clayey	1.00	Flooding	1.00
		Flooding	0.50	Flooding	0.50	Too clayey	1.00
		Percs slowly	0.33	Percs slowly	0.33	Percs slowly	0.33
ScB:							
Sarco	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Too sandy	1.00	Too sandy	1.00
		Too sandy	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.33	Excess sodium	0.92	Percs slowly	0.33
		Droughty	0.29	Percs slowly	0.33	Droughty	0.29
SnC:							
Sarnosa	95	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Droughty	0.40			Droughty	0.40
SnD:							
Sarnosa	95	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Droughty	0.69			Slope	0.88
						Droughty	0.69

Table 11.--Grain and Seed Crops, Domestic Grasses, and Irrigated Grain and Seed Crops for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StC:							
Schattel	85	Very limited		Very limited		Very limited	
		HEL wind	1.00	Potentially or highly erodible	1.00	HEL wind	1.00
		Potentially or highly erodible	1.00	Percs slowly	0.17	Potentially or highly erodible	1.00
		Droughty	0.37	Too clayey	0.11	Droughty	0.37
		Percs slowly	0.17			Percs slowly	0.17
		Too clayey	0.11			Too clayey	0.11
SwA:							
Sinton	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Flooding	0.50	Flooding	0.50	Flooding	0.50
TeA:							
Telferner	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Droughty	0.04			Droughty	0.04
TeB:							
Telferner	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
		Droughty	0.03			Droughty	0.03
ToA:							
Tiocano	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Ponding	0.50	Ponding	0.50	Ponding	0.50
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
UsB:							
Ustarents	95	Not rated		Not rated		Not rated	
VdA:							
Vidauri	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	1.00	Percs slowly	1.00	Percs slowly	1.00
		Ponding	0.50	Ponding	0.50	Ponding	0.50
		Droughty	0.32			Droughty	0.32

Table 11.--Grain and Seed Crops, Domestic Grasses, and Irrigated Grain and Seed Crops for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VwA:							
Vidauri	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	1.00	Percs slowly	1.00	Percs slowly	1.00
		Ponding	0.50	Ponding	0.50	Ponding	0.50
		Droughty	0.37			Droughty	0.37
Wyick	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	1.00	Percs slowly	1.00	Percs slowly	1.00
		Droughty	0.40	Excess sodium	0.68	Droughty	0.40
W:							
Water	100	Not rated		Not rated		Not rated	
WcC:							
Weesatche	85	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
WeA:							
Weesatche	90	Not limited		Not limited		Not limited	
WeB:							
Weesatche	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.04	Too clayey	0.04	Too clayey	0.04
WeB2:							
Weesatche, eroded	95	Not limited		Not limited		Not limited	
WeC:							
Weesatche	95	Very limited		Very limited		Very limited	
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Too clayey	0.04	Too clayey	0.04	Too clayey	0.04
WoA:							
Woodsboro	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Excess sodium	1.00	Depth to saturated zone	1.00
		Droughty	1.00	Depth to saturated zone	1.00	Droughty	1.00
		HEL wind	1.00	Droughty	1.00	HEL wind	1.00
		Potentially or highly erodible	1.00	Potentially or highly erodible	1.00	Potentially or highly erodible	1.00
		Excess Sodium	1.00	Percs slowly	0.50	Excess Sodium	1.00
WyA:							
Wyick	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	1.00	Percs slowly	1.00	Percs slowly	1.00
		Droughty	0.46	Excess sodium	0.68	Droughty	0.46

Table 11.--Grain and Seed Crops, Domestic Grasses, and Irrigated Grain and Seed Crops for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ZaA:							
Zalco	95	Very limited		Very limited		Very limited	
		HEL wind	1.00	Too sandy	1.00	Too sandy	1.00
		Too sandy	1.00	Flooding	0.50	HEL wind	1.00
		Droughty	1.00	Droughty	0.32	Droughty	1.00
		Flooding	0.50			Flooding	0.50
ZcA:							
Zalco	95	Very limited		Very limited		Very limited	
		HEL wind	1.00	Too sandy	1.00	Too sandy	1.00
		Too sandy	1.00	Flooding	0.50	Flooding	1.00
		Droughty	1.00	Droughty	0.32	HEL wind	1.00
		Flooding	0.50			Droughty	1.00
ZkA:							
Zunker	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.80	Flooding	0.50	Droughty	0.80
		Flooding	0.50			Flooding	0.50
ZnA:							
Zunker	90	Somewhat limited		Somewhat limited		Very limited	
		Droughty	0.63	Flooding	0.50	Flooding	1.00
		Flooding	0.50			Droughty	0.63

Table 12.--Irrigated Domestic Grasses and Legumes for Food and Cover, and Burrowing Mammals and Reptiles Wildlife Habitat

(The information in this table indicates the dominant soil condition but does Not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AnA:					
Ander	85	Somewhat limited		Very limited	
		Percs slowly	0.17	Too clayey	1.00
AnB:					
Ander	85	Somewhat limited		Somewhat limited	
		Percs slowly	0.17	Too clayey	0.70
BnB:					
Blanconia	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.17	Too clayey	1.00
BsA:					
Buchel	95	Very limited		Very limited	
		Too clayey	1.00	Flooding	1.00
		Flooding	0.50	Too clayey	1.00
		Percs slowly	0.50		
BuA:					
Buchel	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50		
CnA:					
Cieno	95	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	1.00	Too clayey	0.63
CrA:					
Clareville	90	Somewhat limited		Very limited	
		Too clayey	0.43	Too clayey	1.00
				Flooding	0.50
CrB:					
Clareville	95	Not limited		Very limited	
				Too clayey	1.00

Table 12.--Irrigated Domestic Grasses and Legumes for Food and Cover, and Burrowing Mammals and Reptiles Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Burrowing mammals and reptiles: Rating class and limiting features	Value
CsC:					
Colibro	85	Very limited		Not limited	
		Potentially or highly erodible	1.00		
CsD:					
Colibro	85	Very limited		Not limited	
		Potentially or highly erodible	1.00		
		Slope	0.50		
CyB:					
Coy	94	Somewhat limited		Very limited	
		Too clayey	0.81	Too clayey	1.00
		Percs slowly	0.50		
		Excess salt	0.12		
CyC:					
Coy	85	Very limited		Very limited	
		Potentially or highly erodible	1.00	Too clayey	1.00
		Too clayey	0.81		
		Percs slowly	0.50		
DaA:					
Dacosta	90	Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Too clayey	0.95
		Too clayey	0.07		
DAMS:					
Dams	100	Not rated		Not rated	
DcA:					
Dacosta	60	Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Too clayey	0.95
		Too clayey	0.07		
Contee	30	Somewhat limited		Very limited	
		Too clayey	0.99	Too clayey	1.00
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
		Percs slowly	0.50		
DeC:					
Devine	90	Somewhat limited		Very limited	
		Too gravelly, cobbly, or stony	0.99	Too clayey	1.00
		Droughty	0.41	Too gravelly	0.16
DUMPS:					
Dumps, dumps	100	Not rated		Not rated	

Table 12.--Irrigated Domestic Grasses and Legumes for Food and Cover, and Burrowing Mammals and Reptiles Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Burrowing mammals and reptiles: Rating class and limiting features	Value
EbA:					
Edna	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.50	Too clayey	1.00
EdA:					
Edroy	95	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50		
EnB:					
Elmendorf	50	Somewhat limited		Very limited	
		Percs slowly	0.50	Too clayey	1.00
		Too clayey	0.19		
Denhawken	45	Somewhat limited		Somewhat limited	
		Percs slowly	0.50	Too clayey	0.96
		Too clayey	0.31		
FdA:					
Faddin	85	Somewhat limited		Very limited	
		Percs slowly	0.50	Too clayey	1.00
GdB:					
Goliad	86	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too clayey	0.99
		Percs slowly	0.50		
		Droughty	0.13		
GoB:					
Goliad	95	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too clayey	0.92
		Cemented pan	0.61		
GrA:					
Greta	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	1.00		
		Excess Sodium	0.03		

Table 12.--Irrigated Domestic Grasses and Legumes for Food and Cover, and Burrowing Mammals and Reptiles Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
ImA:					
Imogene-------------	95	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too clayey	0.14
		Percs slowly	1.00		
		Excess Sodium	1.00		
		Droughty	0.01		
InA:					
Inari---------------	85	Very limited		Not limited	
		Percs slowly	1.00		
InB:					
Inari---------------	85	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too clayey	0.22
		Percs slowly	1.00		
KyB:					
Kuy-----------------	95	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too Sandy	0.50
		Too sandy	0.50		
		Droughty	0.08		
LaA:					
Laewest-------------	95	Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50		
LaB:					
Laewest-------------	95	Very limited		Very limited	
		Potentially or highly erodible	1.00	Too clayey	1.00
		Too clayey	1.00		
		Percs slowly	0.50		
LaD:					
Laewest, eroded-----	80	Very limited		Very limited	
		Potentially or highly erodible	1.00	Too clayey	1.00
		Too clayey	1.00		
		Slope	0.50		
		Percs slowly	0.50		
LmB:					
Leming--------------	85	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.98
		Percs slowly	0.33		

Table 12.--Irrigated Domestic Grasses and Legumes for Food and Cover, and Burrowing Mammals and Reptiles Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MbB:					
Milby---------------	90	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
		Too sandy	0.50	Too Sandy	0.50
		Droughty	0.14		
MeA:					
Meguin--------------	95	Somewhat limited		Very limited	
		Too clayey	0.86	Flooding	1.00
		Flooding	0.50		
MgA:					
Meguin--------------	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Too clayey	0.86		
MoA:					
Monteola------------	95	Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50		
MoB:					
Monteola------------	85	Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00
		Percs slowly	0.50		
MoC:					
Monteola------------	85	Very limited		Very limited	
		Potentially or highly erodible	1.00	Too clayey	1.00
		Too clayey	1.00		
		Percs slowly	0.50		
NuC:					
Nusil---------------	90	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too Sandy	0.50
		Too sandy	0.50		
		Percs slowly	0.33		
OdA:					
Odem----------------	50	Not limited		Somewhat limited	
				Flooding	0.50
Riverwash-----------	45	Not rated		Very limited	
				Flooding	1.00

Table 12.--Irrigated Domestic Grasses and Legumes for Food and Cover, and Burrowing Mammals and Reptiles Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Burrowing mammals and reptiles: Rating class and limiting features	Value
OmD:					
Olmedo--------------	90	Very limited		Somewhat limited	
		Droughty	1.00	Too gravelly	0.90
		Potentially or highly erodible	1.00	Content of large stones	0.78
		Cemented pan	1.00	Cemented pan	0.61
		Too gravelly, cobbly, or stony	1.00		
		Slope	0.12		
OrA:					
Orelia--------------	90	Very limited		Somewhat limited	
		Percs slowly	1.00	Too clayey	0.19
PaB:					
Papalote------------	90	Somewhat limited		Somewhat limited	
		Too sandy	0.50	Too clayey	0.95
		Percs slowly	0.17		
PbA:					
Papalote------------	95	Somewhat limited		Somewhat limited	
		Percs slowly	0.17	Too clayey	0.73
PbB:					
Papalote------------	90	Somewhat limited		Somewhat limited	
		Percs slowly	0.17	Too clayey	0.83
PITS:					
Pits, borrow--------	100	Not rated		Not rated	
PrB:					
Parrita-------------	85	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too clayey	0.07
		Cemented pan	1.00	Cemented pan	0.05
		Droughty	0.75		
PtC:					
Pernitas------------	85	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too clayey	0.67
PuC:					
Pettus--------------	85	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too gravelly	0.04
		Droughty	0.12		
RaB:					
Raisin--------------	95	Very limited		Not limited	
		Potentially or highly erodible	1.00		

Table 12.--Irrigated Domestic Grasses and Legumes for Food and Cover, and Burrowing Mammals and Reptiles Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
RaC:					
Raisin	95	Very limited		Not limited	
		Potentially or highly erodible	1.00		
		Slope	0.12		
RaC2:					
Raisin	90	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too clayey	0.12
RnB:					
Raisin	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Potentially or highly erodible	1.00		
RoA:					
Realitos	90	Very limited		Very limited	
		Too clayey	1.00	Ponding	1.00
		Ponding	0.50	Too clayey	1.00
		Percs slowly	0.50		
RsC:					
Rhymes	95	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too Sandy	0.50
		Too sandy	0.50		
		Droughty	0.41		
RuB:					
Runge	95	Not limited		Somewhat limited	
				Too clayey	0.48
RyA:					
Rydolph	85	Very limited		Very limited	
		Excess Sodium	1.00	Flooding	1.00
		Flooding	1.00	Too clayey	0.11
		Too clayey	1.00		
		Percs slowly	0.33		
ScB:					
Sarco	90	Very limited		Very limited	
		Too sandy	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
		Percs slowly	0.33		
SnC:					
Sarnosa	95	Very limited		Not limited	
		Potentially or highly erodible	1.00		

Table 12.--Irrigated Domestic Grasses and Legumes for Food and Cover, and Burrowing Mammals and Reptiles Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SnD:					
Sarnosa-------------	95	Very limited		Not limited	
		Potentially or highly erodible	1.00		
		Slope	0.88		
StC:					
Schattel------------	85	Very limited		Very limited	
		Potentially or highly erodible	1.00	Too clayey	1.00
		Percs slowly	0.17		
		Too clayey	0.11		
SwA:					
Sinton--------------	95	Somewhat limited		Very limited	
		Flooding	0.50	Flooding	1.00
TeA:					
Telferner-----------	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	0.50	Too clayey	1.00
TeB:					
Telferner-----------	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Potentially or highly erodible	1.00	Too clayey	1.00
		Percs slowly	0.50		
ToA:					
Tiocano-------------	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Too clayey	1.00	Depth to saturated zone	1.00
		Ponding	0.50	Too clayey	1.00
		Percs slowly	0.50		
UsB:					
Ustarents-----------	95	Not rated		Somewhat limited	
				Too clayey	0.30
VdA:					
Vidauri-------------	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Percs slowly	1.00	Depth to saturated zone	1.00
		Ponding	0.50	Too clayey	0.25

Table 12.--Irrigated Domestic Grasses and Legumes for Food and Cover, and Burrowing Mammals and Reptiles Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover		Burrowing mammals and reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
VwA:					
Vidauri	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Percs slowly	1.00	Depth to saturated zone	1.00
		Ponding	0.50	Too clayey	0.25
Wyick	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	1.00	Too clayey	0.26
W:					
Water	100	Not rated		Not rated	
WcC:					
Weesatche	85	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too clayey	0.32
WeA:					
Weesatche	90	Not limited		Not limited	
WeB:					
Weesatche	95	Somewhat limited		Somewhat limited	
		Too clayey	0.04	Too clayey	0.62
WeB2:					
Weesatche, eroded	95	Not limited		Somewhat limited	
				Too clayey	0.57
WeC:					
Weesatche	95	Very limited		Somewhat limited	
		Potentially or highly erodible	1.00	Too clayey	0.62
		Too clayey	0.04		
WoA:					
Woodsboro	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Droughty	1.00	Too clayey	1.00
		Potentially or highly erodible	1.00	Flooding	0.50
		Excess Sodium	1.00		
		Percs slowly	0.50		

Table 12.--Irrigated Domestic Grasses and Legumes for Food and Cover, and Burrowing Mammals and Reptiles Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Irrigated domestic grasses and legumes for food and cover: Rating class and limiting features	Value	Burrowing mammals and reptiles: Rating class and limiting features	Value
WyA:					
Wyick	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Percs slowly	1.00	Too clayey	0.26
ZaA:					
Zalco	95	Very limited		Very limited	
		Too sandy	1.00	Flooding	1.00
		Flooding	0.50	Too Sandy	0.50
		Droughty	0.32		
ZcA:					
Zalco	95	Very limited		Very limited	
		Too sandy	1.00	Flooding	1.00
		Flooding	1.00	Too Sandy	0.50
		Droughty	0.32		
ZkA:					
Zunker	85	Somewhat limited		Very limited	
		Flooding	0.50	Flooding	1.00
ZnA:					
Zunker	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00

Table 13.--Upland Native Herbaceous Plants and Upland Shrubs and Vines for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value
AnA:					
Ander	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
AnB:					
Ander	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
BnB:					
Blanconia	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Sandy surface	0.40	Extreme soil temperatures	0.50
				Sandy surface	0.40
BsA:					
Buchel	95	Somewhat limited		Somewhat limited	
		Excess sodium	0.68	Too clayey	0.50
		Too clayey	0.50	Extreme soil temperatures	0.50
BuA:					
Buchel	85	Somewhat limited		Somewhat limited	
		Excess sodium	0.68	Too clayey	0.50
		Too clayey	0.50	Extreme soil temperatures	0.50
CnA:					
Cieno	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Extreme soil temperatures	0.50
CrA:					
Clareville	90	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
CrB:					
Clareville	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
CsC:					
Colibro	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50

Table 13.--Upland Native Herbaceous Plants and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value
CsD:					
Colibro	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
CyB:					
Coy	94	Somewhat limited		Somewhat limited	
		Excess sodium	0.32	Extreme soil temperatures	0.50
		Excess salt	0.01	Excess salt	0.01
CyC:					
Coy	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
DaA:					
Dacosta	90	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
DAMS:					
Dams	100	Not rated		Not rated	
DcA:					
Dacosta	60	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
Contee	30	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
				Extreme soil temperatures	0.50
DeC:					
Devine	90	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
DUMPS:					
Dumps, dumps	100	Not rated		Not rated	
EbA:					
Edna	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Extreme soil temperatures	0.50
EdA:					
Edroy	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50

Table 13.--Upland Native Herbaceous Plants and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value
EnB:					
Elmendorf	50	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
Denhawken	45	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
FdA:					
Faddin	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
GdB:					
Goliad	86	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
GoB:					
Goliad	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
				Cemented pan	0.01
GrA:					
Greta	85	Very limited		Very limited	
		Excess sodium	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Extreme soil temperatures	0.50
				Excess Sodium	0.03
ImA:					
Imogene	95	Very limited		Very limited	
		Excess sodium	1.00	Excess Sodium	1.00
				Extreme soil temperatures	0.50
InA:					
Inari	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
InB:					
Inari	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
KyB:					
Kuy	95	Somewhat limited		Somewhat limited	
		Sandy surface	0.60	Sandy surface	0.60
				Extreme soil temperatures	0.50

Table 13.--Upland Native Herbaceous Plants and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants		Upland shrubs and vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value
LaA:					
Laewest	95	Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50
LaB:					
Laewest	95	Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50
LaD:					
Laewest, eroded	80	Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50
LmB:					
Leming	85	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.98	Depth to saturated zone	0.98
		Sandy surface	0.40	Extreme soil temperatures	0.50
				Sandy surface	0.40
MbB:					
Milby	90	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.75	Depth to saturated zone	0.75
		Sandy surface	0.60	Sandy surface	0.60
				Extreme soil temperatures	0.50
MeA:					
Meguin	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
MgA:					
Meguin	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
MoA:					
Monteola	95	Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50
MoB:					
Monteola	85	Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50

Table 13.--Upland Native Herbaceous Plants and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value
MoC:					
Monteola	85	Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50
NuC:					
Nusil	90	Somewhat limited		Somewhat limited	
		Sandy surface	0.60	Sandy surface	0.60
				Extreme soil temperatures	0.50
OdA:					
Odem	50	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
Riverwash	45	Not rated		Not limited	
OmD:					
Olmedo	90	Somewhat limited		Somewhat limited	
		Droughty	0.50	Cemented pan	0.83
		Too gravelly, cobbly, or stony	0.47	Droughty	0.50
				Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.47
OrA:					
Orelia	90	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
PaB:					
Papalote	90	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Extreme soil temperatures	0.50
				Sandy surface	0.40
PbA:					
Papalote	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
PbB:					
Papalote	90	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
PITS:					
Pits, borrow	100	Not rated		Not rated	

Table 13.--Upland Native Herbaceous Plants and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value
PrB:					
Parrita	85	Not limited		Somewhat limited	
				Cemented pan	0.68
				Extreme soil temperatures	0.50
PtC:					
Pernitas	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
PuC:					
Pettus	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
RaB:					
Raisin	95	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Extreme soil temperatures	0.50
				Sandy surface	0.40
RaC:					
Raisin	95	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Extreme soil temperatures	0.50
				Sandy surface	0.40
RaC2:					
Raisin	90	Somewhat limited		Somewhat limited	
		Sandy surface	0.40	Extreme soil temperatures	0.50
				Sandy surface	0.40
RnB:					
Raisin	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Extreme soil temperatures	0.50
RoA:					
Realitos	90	Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50
RsC:					
Rhymes	95	Somewhat limited		Somewhat limited	
		Sandy surface	0.60	Sandy surface	0.60
				Extreme soil temperatures	0.50
RuB:					
Runge	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50

Table 13.--Upland Native Herbaceous Plants and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value
RyA:					
Rydolph	85	Very limited		Very limited	
		Excess sodium	1.00	Excess Sodium	1.00
		Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50
ScB:					
Sarco	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	0.92	Sandy surface	0.60
		Sandy surface	0.60	Extreme soil temperatures	0.50
SnC:					
Sarnosa	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
SnD:					
Sarnosa	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
StC:					
Schattel	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
SwA:					
Sinton	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
TeA:					
Telferner	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Extreme soil temperatures	0.50
TeB:					
Telferner	95	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Extreme soil temperatures	0.50

Table 13.--Upland Native Herbaceous Plants and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants: Rating class and limiting features	Value	Upland shrubs and vines: Rating class and limiting features	Value
ToA:					
Tiocano	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50
UsB:					
Ustarents	95	Not rated		Not limited	
VdA:					
Vidauri	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Extreme soil temperatures	0.50
VwA:					
Vidauri	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Extreme soil temperatures	0.50
Wyick	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	0.68	Extreme soil temperatures	0.50
W:					
Water	100	Not rated		Not rated	
WcC:					
Weesatche	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
WeA:					
Weesatche	90	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
WeB:					
Weesatche	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
WeB2:					
Weesatche, eroded	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
WeC:					
Weesatche	95	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50

Table 13.--Upland Native Herbaceous Plants and Upland Shrubs and Vines for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants		Upland shrubs and vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value
WoA:					
Woodsboro-----------	95	Very limited		Very limited	
		Excess sodium	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Excess Sodium	1.00
		Droughty	0.50	Droughty	0.50
		Excess salt	0.01	Extreme soil temperatures	0.50
				Excess salt	0.01
WyA:					
Wyick---------------	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	0.68	Extreme soil temperatures	0.50
ZaA:					
Zalco---------------	95	Somewhat limited		Somewhat limited	
		Sandy surface	0.60	Sandy surface	0.60
				Extreme soil temperatures	0.50
ZcA:					
Zalco---------------	95	Somewhat limited		Somewhat limited	
		Sandy surface	0.60	Sandy surface	0.60
				Extreme soil temperatures	0.50
ZkA:					
Zunker--------------	85	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50
ZnA:					
Zunker--------------	90	Not limited		Somewhat limited	
				Extreme soil temperatures	0.50

Table 14.--Upland Deciduous Trees for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Upland deciduous trees: Value
AnA:			
Ander	85	Somewhat limited	
		Too arid	0.50
AnB:			
Ander	85	Somewhat limited	
		Too arid	0.50
BnB:			
Blanconia	85	Very limited	
		Depth to saturated zone	1.00
		Too arid	0.50
BsA:			
Buchel	95	Somewhat limited	
		Too arid	0.50
BuA:			
Buchel	85	Somewhat limited	
		Too arid	0.50
CnA:			
Cieno	95	Very limited	
		Depth to saturated zone	1.00
CrA:			
Clareville	90	Somewhat limited	
		Too arid	0.50
CrB:			
Clareville	95	Somewhat limited	
		Too arid	0.50

Table 14.--Upland Deciduous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value
CsC:			
Colibro	85	Somewhat limited	
		Too arid	0.50
CsD:			
Colibro	85	Somewhat limited	
		Too arid	0.50
CyB:			
Coy	94	Somewhat limited	
		Too arid	0.50
CyC:			
Coy	85	Somewhat limited	
		Too arid	0.50
DaA:			
Dacosta	90	Not limited	
DAMS:			
Dams	100	Not rated	
DcA:			
Dacosta	60	Not limited	
Contee	30	Very limited	
		Depth to saturated zone	1.00
DeC:			
Devine	90	Somewhat limited	
		Too arid	0.50
		Droughty	0.41
DUMPS:			
Dumps, dumps	100	Not rated	
EbA:			
Edna	95	Very limited	
		Depth to saturated zone	1.00

Table 14.--Upland Deciduous Trees for Wildlife Habitat--
Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value
EdA:			
Edroy	95	Very limited	
		Depth to saturated zone	1.00
EnB:			
Elmendorf	50	Somewhat limited	
		Too arid	0.50
Denhawken	45	Somewhat limited	
		Too arid	0.50
FdA:			
Faddin	85	Not limited	
GdB:			
Goliad	86	Somewhat limited	
		Too arid	0.50
		Droughty	0.13
GoB:			
Goliad	95	Somewhat limited	
		Cemented pan	0.61
		Too arid	0.50
GrA:			
Greta	85	Very limited	
		Depth to saturated zone	1.00
		Too arid	0.50
ImA:			
Imogene	95	Somewhat limited	
		Too arid	0.50
		Droughty	0.01
InA:			
Inari	85	Somewhat limited	
		Too arid	0.50
InB:			
Inari	85	Somewhat limited	
		Too arid	0.50

Table 14.--Upland Deciduous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value
KyB:			
Kuy	95	Somewhat limited	
		Depth to saturated zone	0.44
		Droughty	0.08
LaA:			
Laewest	95	Not limited	
LaB:			
Laewest	95	Not limited	
LaD:			
Laewest, eroded	80	Not limited	
LmB:			
Leming	85	Very limited	
		Depth to saturated zone	1.00
		Too arid	0.50
MbB:			
Milby	90	Very limited	
		Depth to saturated zone	1.00
		Droughty	0.14
MeA:			
Meguin	95	Somewhat limited	
		Too arid	0.50
MgA:			
Meguin	95	Somewhat limited	
		Too arid	0.50
MoA:			
Monteola	95	Somewhat limited	
		Too arid	0.50

Table 14.--Upland Deciduous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Upland deciduous trees: Value
MoB:			
Monteola	85	Somewhat limited	
		Too arid	0.50
MoC:			
Monteola	85	Somewhat limited	
		Too arid	0.50
NuC:			
Nusil	90	Somewhat limited	
		Too arid	0.50
OdA:			
Odem	50	Somewhat limited	
		Too arid	0.50
Riverwash	45	Not rated	
OmD:			
Olmedo	90	Very limited	
		Droughty	1.00
		Cemented pan	1.00
		Too arid	0.50
OrA:			
Orelia	90	Somewhat limited	
		Too arid	0.50
PaB:			
Papalote	90	Somewhat limited	
		Too arid	0.50
PbA:			
Papalote	95	Somewhat limited	
		Too arid	0.50
PbB:			
Papalote	90	Somewhat limited	
		Too arid	0.50
PITS:			
Pits, borrow	100	Not rated	

Table 14.--Upland Deciduous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value
PrB:			
Parrita	85	Very limited	
		Cemented pan	1.00
		Droughty	0.75
		Too arid	0.50
PtC:			
Pernitas	85	Somewhat limited	
		Too arid	0.50
PuC:			
Pettus	85	Somewhat limited	
		Too arid	0.50
		Droughty	0.12
RaB:			
Raisin	95	Somewhat limited	
		Too arid	0.50
RaC:			
Raisin	95	Somewhat limited	
		Too arid	0.50
RaC2:			
Raisin	90	Somewhat limited	
		Too arid	0.50
RnB:			
Raisin	90	Very limited	
		Depth to saturated zone	1.00
		Too arid	0.50
RoA:			
Realitos	90	Somewhat limited	
		Too arid	0.50
RsC:			
Rhymes	95	Somewhat limited	
		Too arid	0.50
		Droughty	0.41

Table 14.--Upland Deciduous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value
RuB:			
Runge	95	Somewhat limited	
		Too arid	0.50
RyA:			
Rydolph	85	Somewhat limited	
		Depth to saturated zone	0.84
ScB:			
Sarco	90	Very limited	
		Depth to saturated zone	1.00
		Too arid	0.50
SnC:			
Sarnosa	95	Somewhat limited	
		Too arid	0.50
SnD:			
Sarnosa	95	Somewhat limited	
		Too arid	0.50
StC:			
Schattel	85	Somewhat limited	
		Too arid	0.50
SwA:			
Sinton	95	Somewhat limited	
		Too arid	0.50
TeA:			
Telferner	90	Very limited	
		Depth to saturated zone	1.00
TeB:			
Telferner	95	Very limited	
		Depth to saturated zone	1.00

Table 14.--Upland Deciduous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value
ToA:			
Tiocano	85	Very limited	
		Depth to saturated zone	1.00
		Too arid	0.50
UsB:			
Ustarents	95	Not rated	
VdA:			
Vidauri	85	Very limited	
		Depth to saturated zone	1.00
		Too arid	0.50
VwA:			
Vidauri	55	Very limited	
		Depth to saturated zone	1.00
		Too arid	0.50
Wyick	40	Very limited	
		Depth to saturated zone	1.00
		Too arid	0.50
W:			
Water	100	Not rated	
WcC:			
Weesatche	85	Somewhat limited	
		Too arid	0.50
WeA:			
Weesatche	90	Somewhat limited	
		Too arid	0.50
WeB:			
Weesatche	95	Somewhat limited	
		Too arid	0.50

Table 14.--Upland Deciduous Trees for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees: Rating class and limiting features	Value
WeB2:			
Weesatche, eroded	95	Somewhat limited	
		Too arid	0.50
WeC:			
Weesatche	95	Somewhat limited	
		Too arid	0.50
WoA:			
Woodsboro	95	Very limited	
		Depth to saturated zone	1.00
		Droughty	1.00
WyA:			
Wyick	85	Very limited	
		Depth to saturated zone	1.00
		Too arid	0.50
ZaA:			
Zalco	95	Somewhat limited	
		Droughty	0.32
ZcA:			
Zalco	95	Somewhat limited	
		Droughty	0.32
ZkA:			
Zunker	85	Somewhat limited	
		Too arid	0.50
ZnA:			
Zunker	90	Somewhat limited	
		Too arid	0.50

Table 15.--Riparian Herbaceous Plants, Riparian Shrubs, Vines and Trees, and Freshwater Plants for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AnA:							
Ander	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
AnB:							
Ander	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
BnB:							
Blanconia	85	Very limited		Not limited		Somewhat limited	
		Infrequent flooding	1.00			Too acid	0.32
		Too sandy	0.50				
BsA:							
Buchel	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
BuA:							
Buchel	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
CnA:							
Cieno	95	Very limited		Very limited		Somewhat limited	
		Ponding	1.00	Ponding	1.00	Too acid	0.68
		Infrequent flooding	1.00			Ponding	0.50
CrA:							
Clareville	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
CrB:							
Clareville	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
CsC:							
Colibro	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				

Table 15.--Riparian Herbaceous Plants, Riparian Shrubs, Vines and Trees, and Freshwater Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants: Rating class and limiting features	Value	Riparian shrubs, vines, and trees: Rating class and limiting features	Value	Freshwater wetland plants: Rating class and limiting features	Value
CsD:							
Colibro	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
CyB:							
Coy	94	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
CyC:							
Coy	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
DaA:							
Dacosta	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
DAMS:							
Dams	100	Not rated		Not rated		Not rated	
DcA:							
Dacosta	60	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
Contee	30	Very limited		Not limited		Somewhat limited	
		Infrequent flooding	1.00			Too dry	0.53
		Too dry	0.53				
DeC:							
Devine	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.41		
DUMPS:							
Dumps, dumps	100	Not rated		Not rated		Not rated	
EbA:							
Edna	95	Very limited		Not limited		Not limited	
		Infrequent flooding	1.00				
EdA:							
Edroy	95	Very limited		Very limited		Somewhat limited	
		Ponding	1.00	Ponding	1.00	Ponding	0.50
		Infrequent flooding	1.00				

Table 15.--Riparian Herbaceous Plants, Riparian Shrubs, Vines and Trees, and Freshwater Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants: Rating class and limiting features	Value	Riparian shrubs, vines, and trees: Rating class and limiting features	Value	Freshwater wetland plants: Rating class and limiting features	Value
EnB:							
Elmendorf	50	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
Denhawken	45	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
FdA:							
Faddin	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
GdB:							
Goliad	86	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.13		
GoB:							
Goliad	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
GrA:							
Greta	85	Very limited		Not limited		Not limited	
		Infrequent flooding	1.00				
ImA:							
Imogene	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.01	Excess salt	0.04
InA:							
Inari	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
InB:							
Inari	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
KyB:							
Kuy	95	Very limited		Somewhat limited		Very limited	
		Too sandy	1.00	Too dry	0.56	Too dry	1.00
		Too dry	1.00	Droughty	0.08	Too sandy	0.50
		Infrequent flooding	1.00				

Table 15.--Riparian Herbaceous Plants, Riparian Shrubs, Vines and Trees, and Freshwater Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants: Rating class and limiting features	Value	Riparian shrubs, vines, and trees: Rating class and limiting features	Value	Freshwater wetland plants: Rating class and limiting features	Value
LaA:							
Laewest	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
LaB:							
Laewest	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
LaD:							
Laewest, eroded	80	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
LmB:							
Leming	85	Very limited		Not limited		Somewhat limited	
		Infrequent flooding	1.00			Too dry	0.22
		Too sandy	0.50				
		Too dry	0.22				
MbB:							
Milby	90	Very limited		Somewhat limited		Somewhat limited	
		Too sandy	1.00	Droughty	0.14	Too dry	0.53
		Infrequent flooding	1.00			Too sandy	0.50
		Too dry	0.53			Too acid	0.08
MeA:							
Meguin	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
MgA:							
Meguin	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
MoA:							
Monteola	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
MoB:							
Monteola	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				

Table 15.--Riparian Herbaceous Plants, Riparian Shrubs, Vines and Trees, and Freshwater Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants: Rating class and limiting features	Value	Riparian shrubs, vines, and trees: Rating class and limiting features	Value	Freshwater wetland plants: Rating class and limiting features	Value
MoC:							
Monteola	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
NuC:							
Nusil	90	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too dry	1.00	Too dry	1.00
		Too dry	1.00			Too sandy	0.50
		Infrequent flooding	1.00				
OdA:							
Odem	50	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
Riverwash	45	Not rated		Not rated		Very limited	
						Too dry	1.00
OmD:							
Olmedo	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00		
		Too gravelly, cobbly, or stony	0.99				
OrA:							
Orelia	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
PaB:							
Papalote	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
		Too sandy	0.50				
PbA:							
Papalote	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00			Too acid	0.04
PbB:							
Papalote	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
PITS:							
Pits, borrow	100	Not rated		Not rated		Not rated	

Table 15.--Riparian Herbaceous Plants, Riparian Shrubs, Vines and Trees, and Freshwater Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants: Rating class and limiting features	Value	Riparian shrubs, vines, and trees: Rating class and limiting features	Value	Freshwater wetland plants: Rating class and limiting features	Value
PrB:							
Parrita	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.75		
PtC:							
Pernitas	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
PuC:							
Pettus	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.12		
RaB:							
Raisin	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
		Too sandy	0.50				
RaC:							
Raisin	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
		Too sandy	0.50				
RaC2:							
Raisin	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
		Too sandy	0.50				
RnB:							
Raisin	90	Very limited		Not limited		Not limited	
		Infrequent flooding	1.00				
RoA:							
Realitos	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Ponding	0.50		
RsC:							
Rhymes	95	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too dry	1.00	Too dry	1.00
		Too dry	1.00	Droughty	0.41	Too sandy	0.50
		Infrequent flooding	1.00				

Table 15.--Riparian Herbaceous Plants, Riparian Shrubs, Vines and Trees, and Freshwater Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RuB:							
Runge	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
RyA:							
Rydolph	85	Very limited		Somewhat limited		Very limited	
		Too dry	1.00	Too dry	0.16	Too dry	1.00
		Excess sodium	0.05	Excess sodium	0.11	Excess sodium	1.00
ScB:							
Sarco	90	Very limited		Not limited		Very limited	
		Too sandy	1.00			Too sandy	1.00
		Infrequent flooding	1.00			Too acid	0.32
SnC:							
Sarnosa	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
SnD:							
Sarnosa	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
StC:							
Schattel	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
SwA:							
Sinton	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
TeA:							
Telferner	90	Very limited		Not limited		Not limited	
		Infrequent flooding	1.00				
TeB:							
Telferner	95	Very limited		Not limited		Not limited	
		Infrequent flooding	1.00				
ToA:							
Tiocano	85	Very limited		Somewhat limited		Not limited	
		Infrequent flooding	1.00	Ponding	0.50		

Table 15.--Riparian Herbaceous Plants, Riparian Shrubs, Vines and Trees, and Freshwater Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants: Rating class and limiting features	Value	Riparian shrubs, vines, and trees: Rating class and limiting features	Value	Freshwater wetland plants: Rating class and limiting features	Value
UsB:							
Ustarents	95	Not rated		Not rated		Very limited	
						Too dry	1.00
VdA:							
Vidauri	85	Very limited		Somewhat limited		Somewhat limited	
		Infrequent flooding	1.00	Ponding	0.50	Too acid	0.14
VwA:							
Vidauri	55	Very limited		Somewhat limited		Somewhat limited	
		Infrequent flooding	1.00	Ponding	0.50	Too acid	0.14
Wyick	40	Very limited		Not limited		Somewhat limited	
		Infrequent flooding	1.00			Too acid	0.32
W:							
Water	100	Not rated		Not rated		Not rated	
WcC:							
Weesatche	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
WeA:							
Weesatche	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
WeB:							
Weesatche	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
WeB2:							
Weesatche, eroded	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
WeC:							
Weesatche	95	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
WoA:							
Woodsboro	95	Very limited		Very limited		Very limited	
		Infrequent flooding	1.00	Droughty	1.00	Excess sodium	1.00
		Excess sodium	0.94	Excess sodium	1.00	Excess salt	1.00
		Excess salt	0.14	Excess salt	0.14		

Table 15.--Riparian Herbaceous Plants, Riparian Shrubs, Vines and Trees, and Freshwater Plants for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants: Rating class and limiting features	Value	Riparian shrubs, vines, and trees: Rating class and limiting features	Value	Freshwater wetland plants: Rating class and limiting features	Value
WyA:							
Wyick	85	Very limited		Not limited		Somewhat limited	
		Infrequent flooding	1.00			Too acid	0.32
ZaA:							
Zalco	95	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too dry	1.00	Too dry	1.00
		Too dry	1.00	Droughty	0.32	Too sandy	1.00
		Infrequent flooding	1.00				
ZcA:							
Zalco	95	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too dry	1.00	Too dry	1.00
		Too dry	1.00	Droughty	0.32	Too sandy	1.00
ZkA:							
Zunker	85	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00				
ZnA:							
Zunker	90	Very limited		Very limited		Very limited	
		Too dry	1.00	Too dry	1.00	Too dry	1.00

Table 16.--Camp Areas, Picnic Areas, and Playgrounds

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
AnA:							
Ander	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.39	Slow water movement	0.39	Slow water movement	0.39
		Too sandy	0.08	Too sandy	0.08	Too sandy	0.08
AnB:							
Ander	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.39	Slow water movement	0.39	Slow water movement	0.39
		Too sandy	0.08	Too sandy	0.08	Too sandy	0.08
BnB:							
Blanconia	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.90	Too sandy	0.90	Too sandy	0.90
		Slow water movement	0.39	Slow water movement	0.39	Slow water movement	0.39
BsA:							
Buchel	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Sodium content	1.00	Sodium content	1.00
		Sodium content	1.00	Too clayey	0.50	Flooding	0.60
		Too clayey	0.50	Slow water movement	0.45	Too clayey	0.50
		Slow water movement	0.45			Slow water movement	0.45
BuA:							
Buchel	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Sodium content	1.00	Flooding	1.00
		Sodium content	1.00	Too clayey	0.50	Sodium content	1.00
		Too clayey	0.50	Slow water movement	0.45	Too clayey	0.50
		Slow water movement	0.45	Flooding	0.40	Slow water movement	0.45
CnA:							
Cieno	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
CrA:							
Clareville	90	Very limited		Not limited		Not limited	
		Flooding	1.00				

Table 16.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
CrB:							
Clareville	95	Not limited		Not limited		Not limited	
CsC:							
Colibro	85	Not limited		Not limited		Somewhat limited	
						Slope	0.50
CsD:							
Colibro	85	Not limited		Not limited		Very limited	
						Slope	1.00
CyB:							
Coy	94	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
CyC:							
Coy	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.45	Slow water movement	0.45	Slope	0.50
						Slow water movement	0.45
DaA:							
Dacosta	90	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
DAMS:							
Dams	100	Not rated		Not rated		Not rated	
DcA:							
Dacosta	60	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
Contee	30	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
DeC:							
Devine	90	Somewhat limited		Somewhat limited		Very limited	
		Gravel	0.94	Gravel	0.94	Gravel	1.00
						Slope	0.12
DUMPS:							
Dumps, dumps	100	Not rated		Not rated		Not rated	
EbA:							
Edna	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00

Table 16.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
EdA:							
Edroy	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
EnB:							
Elmendorf	50	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
Denhawken	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
FdA:							
Faddin	85	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Too sandy	0.02	Too sandy	0.02	Too sandy	0.02
GdB:							
Goliad	86	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
GoB:							
Goliad	95	Somewhat limited		Somewhat limited		Not limited	
		Depth to cemented pan	0.03	Depth to cemented pan	0.03		
GrA:							
Greta	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
		Too sandy	0.02	Too sandy	0.02	Too sandy	0.02
ImA:							
Imogene	95	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
InA:							
Inari	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
		Too sandy	0.12	Too sandy	0.12	Too sandy	0.12

Table 16.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
InB:							
Inari	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
		Too sandy	0.12	Too sandy	0.12	Too sandy	0.12
KyB:							
Kuy	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.96	Too sandy	0.96	Too sandy	0.96
LaA:							
Laewest	95	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Sodium content	1.00	Too clayey	1.00	Too clayey	1.00
		Too clayey	1.00	Sodium content	1.00	Sodium content	1.00
LaB:							
Laewest	95	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
LaD:							
Laewest, eroded	80	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Too clayey	1.00	Too clayey	1.00	Slope	1.00
						Too clayey	1.00
LmB:							
Leming	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.96	Too sandy	0.96	Too sandy	0.96
		Depth to saturated zone	0.90	Depth to saturated zone	0.60	Depth to saturated zone	0.90
		Slow water movement	0.39	Slow water movement	0.39	Slow water movement	0.39
MbB:							
Milby	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.98	Too sandy	0.98	Too sandy	0.98
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
MeA:							
Meguin	95	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
MgA:							
Meguin	95	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
MoA:							
Monteola	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45

Table 16.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MoB:							
Monteola------------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
MoC:							
Monteola------------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Slope	0.50
		Slow water movement	0.45	Slow water movement	0.45	Too clayey	0.50
						Slow water movement	0.45
NuC:							
Nusil---------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.98	Too sandy	0.98	Too sandy	0.98
		Slow water movement	0.39	Slow water movement	0.39	Slow water movement	0.39
						Slope	0.12
OdA:							
Odem----------------	50	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too sandy	0.53	Too sandy	0.53
		Too sandy	0.53				
Riverwash-----------	45	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
OmD:							
Olmedo--------------	90	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel	1.00
		Gravel	1.00	Gravel	1.00	Depth to cemented pan	1.00
						Slope	0.88
OrA:							
Orelia--------------	90	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
		Too sandy	0.17	Too sandy	0.17	Too sandy	0.17
PaB:							
Papalote------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.41	Too sandy	0.41	Too sandy	0.41
		Slow water movement	0.39	Slow water movement	0.39	Slow water movement	0.39
PbA:							
Papalote------------	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.39	Slow water movement	0.39	Slow water movement	0.39
		Too sandy	0.07	Too sandy	0.07	Too sandy	0.07

Table 16.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
PbB:							
Papalote	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.52	Too sandy	0.52	Too sandy	0.52
		Slow water movement	0.39	Slow water movement	0.39	Slow water movement	0.39
PITS:							
Pits, borrow	100	Not rated		Not rated		Not rated	
PrB:							
Parrita	85	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
PtC:							
Pernitas	85	Not limited		Not limited		Somewhat limited	
						Slope	0.50
PuC:							
Pettus	85	Not limited		Not limited		Somewhat limited	
						Gravel	0.86
						Slope	0.50
RaB:							
Raisin	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.92	Too sandy	0.92	Too sandy	0.92
RaC:							
Raisin	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.54	Too sandy	0.54	Slope	0.88
						Too sandy	0.54
RaC2:							
Raisin	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.56	Too sandy	0.56	Too sandy	0.56
						Slope	0.12
RnB:							
Raisin	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.34	Too sandy	0.34	Too sandy	0.34
RoA:							
Realitos	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
RsC:							
Rhymes	95	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
						Slope	0.12
RuB:							
Runge	95	Not limited		Not limited		Not limited	

Table 16.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RyA:							
Rydolph	85	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Flooding	1.00	Too clayey	1.00	Flooding	1.00
		Too clayey	1.00	Slow water movement	0.94	Too clayey	1.00
		Slow water movement	0.94	Flooding	0.40	Slow water movement	0.94
ScB:							
Sarco	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
		Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.39	Slow water movement	0.39	Slow water movement	0.39
SnC:							
Sarnosa	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.19	Too sandy	0.19	Too sandy	0.19
						Slope	0.12
SnD:							
Sarnosa	95	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.08	Too sandy	0.08	Slope	1.00
						Too sandy	0.08
StC:							
Schattel	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.39	Slow water movement	0.39	Slow water movement	0.39
						Slope	0.12
SwA:							
Sinton	95	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
TeA:							
Telferner	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Too sandy	0.46	Too sandy	0.46	Too sandy	0.46
TeB:							
Telferner	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00

Table 16.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
ToA:							
Tiocano	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
UsB:							
Ustarents	95	Not limited		Not limited		Somewhat limited	
						Slope	0.50
VdA:							
Vidauri	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
VwA:							
Vidauri	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
Wyick	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
		Too sandy	0.16	Too sandy	0.16	Too sandy	0.16
W:							
Water	100	Not rated		Not rated		Not rated	
WcC:							
Weesatche	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.03	Too sandy	0.03	Too sandy	0.03
WeA:							
Weesatche	90	Not limited		Not limited		Not limited	
WeB:							
Weesatche	95	Not limited		Not limited		Not limited	
WeB2:							
Weesatche, eroded	95	Not limited		Not limited		Not limited	
WeC:							
Weesatche	95	Not limited		Not limited		Somewhat limited	
						Slope	0.28

Table 16.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WoA:							
Woodsboro	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Flooding	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slow water movement	1.00	Salinity	0.13	Salinity	0.13
		Salinity	0.13				
WyA:							
Wyick	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
		Too sandy	0.16	Too sandy	0.16	Too sandy	0.16
ZaA:							
Zalco	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Too sandy	1.00	Too sandy	1.00
		Too sandy	1.00			Flooding	0.60
ZcA:							
Zalco	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Too sandy	1.00	Too sandy	1.00
		Too sandy	1.00	Flooding	0.40	Flooding	1.00
ZkA:							
Zunker	85	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
ZnA:							
Zunker	90	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00

Table 17.--Paths, Trails, and Golf Course Fairways

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AnA:							
Ander	85	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.08	Too sandy	0.08		
AnB:							
Ander	85	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.08	Too sandy	0.08		
BnB:							
Blanconia	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.90	Too sandy	0.90		
BsA:							
Buchel	95	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
						Sodium content	1.00
						Flooding	0.60
BuA:							
Buchel	85	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Too clayey	1.00
						Sodium content	1.00
CnA:							
Cieno	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
CrA:							
Clareville	90	Not limited		Not limited		Not limited	
CrB:							
Clareville	95	Not limited		Not limited		Not limited	
CsC:							
Colibro	85	Not limited		Not limited		Very limited	
						Carbonate content	1.00
CsD:							
Colibro	85	Not limited		Not limited		Very limited	
						Carbonate content	1.00
CyB:							
Coy	94	Not limited		Not limited		Not limited	

Table 17.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CyC:							
Coy	85	Not limited		Not limited		Not limited	
DaA:							
Dacosta	90	Not limited		Not limited		Not limited	
DAMS:							
Dams	100	Not rated		Not rated		Not rated	
DcA:							
Dacosta	60	Not limited		Not limited		Not limited	
Contee	30	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.19
DeC:							
Devine	90	Not limited		Not limited		Somewhat limited	
						Gravel	0.94
						Droughty	0.42
DUMPS:							
Dumps, dumps	100	Not rated		Not rated		Not rated	
EbA:							
Edna	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
EdA:							
Edroy	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
EnB:							
Elmendorf	50	Not limited		Not limited		Very limited	
						Sodium content	1.00
Denhawken	45	Not limited		Not limited		Not limited	
FdA:							
Faddin	85	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.02	Too sandy	0.02		
GdB:							
Goliad	86	Not limited		Not limited		Very limited	
						Carbonate content	1.00
						Droughty	0.15
GoB:							
Goliad	95	Not limited		Not limited		Very limited	
						Carbonate content	1.00
						Depth to cemented pan	0.03

Table 17.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GrA:							
Greta	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Too sandy	0.02	Too sandy	0.02	Depth to saturated zone	1.00
ImA:							
Imogene	95	Not limited		Not limited		Very limited	
						Sodium content	1.00
						Droughty	0.01
InA:							
Inari	85	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.12	Too sandy	0.12		
InB:							
Inari	85	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.12	Too sandy	0.12		
KyB:							
Kuy	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.96	Too sandy	0.96	Droughty	0.09
LaA:							
Laewest	95	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
						Sodium content	1.00
LaB:							
Laewest	95	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
LaD:							
Laewest, eroded	80	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
LmB:							
Leming	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.96	Too sandy	0.96	Depth to saturated zone	0.60
		Depth to saturated zone	0.22	Depth to saturated zone	0.22		
MbB:							
Milby	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.98	Too sandy	0.98	Depth to saturated zone	0.19
						Droughty	0.15
MeA:							
Meguin	95	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
MgA:							
Meguin	95	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00

Table 17.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MoA:							
Monteola	95	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
MoB:							
Monteola	85	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
MoC:							
Monteola	85	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
NuC:							
Nusil	90	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.98	Too sandy	0.98		
OdA:							
Odem	50	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.53	Too sandy	0.53		
Riverwash	45	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
						Droughty	0.69
OmD:							
Olmedo	90	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel	1.00	Depth to cemented pan	1.00
						Droughty	1.00
						Carbonate content	1.00
						Gravel	1.00
						Large stones	0.01
OrA:							
Orelia	90	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.17	Too sandy	0.17	Sodium content	1.00
PaB:							
Papalote	90	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.41	Too sandy	0.41		
PbA:							
Papalote	95	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.07	Too sandy	0.07		
PbB:							
Papalote	90	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.52	Too sandy	0.52		
PITS:							
Pits, borrow	100	Not rated		Not rated		Not rated	
PrB:							
Parrita	85	Not limited		Not limited		Very limited	
						Depth to cemented pan	1.00
						Carbonate content	1.00
						Droughty	0.76

Table 17.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PtC:							
Pernitas	85	Not limited		Not limited		Not limited	
PuC:							
Pettus	85	Not limited		Not limited		Very limited	
						Carbonate content	1.00
						Droughty	0.13
RaB:							
Raisin	95	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.92	Too sandy	0.92		
RaC:							
Raisin	95	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.54	Too sandy	0.54		
RaC2:							
Raisin	90	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.56	Too sandy	0.56		
RnB:							
Raisin	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.34	Too sandy	0.34		
RoA:							
Realitos	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
RsC:							
Rhymes	95	Very limited		Very limited		Somewhat limited	
		Too sandy	1.00	Too sandy	1.00	Droughty	0.42
RuB:							
Runge	95	Not limited		Not limited		Not limited	
RyA:							
Rydolph	85	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Sodium content	1.00
						Too clayey	1.00
ScB:							
Sarco	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
		Too sandy	1.00	Too sandy	1.00	Depth to saturated zone	1.00
						Sodium content	1.00
SnC:							
Sarnosa	95	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.19	Too sandy	0.19		

Table 17.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SnD:							
Sarnosa	95	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.08	Too sandy	0.08	Carbonate content	1.00
StC:							
Schattel	85	Not limited		Not limited		Not limited	
SwA:							
Sinton	95	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
TeA:							
Telferner	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.46	Too sandy	0.46		
TeB:							
Telferner	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
ToA:							
Tiocano	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
UsB:							
Ustarents	95	Not limited		Not limited		Not limited	
VdA:							
Vidauri	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
VwA:							
Vidauri	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
Wyick	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.16	Too sandy	0.16	Sodium content	1.00
W:							
Water	100	Not rated		Not rated		Not rated	
WcC:							
Weesatche	85	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.03	Too sandy	0.03		

Table 17.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WeA:							
Weesatche-----------	90	Not limited		Not limited		Very limited	
						Carbonate content	1.00
WeB:							
Weesatche-----------	95	Not limited		Not limited		Not limited	
WeB2:							
Weesatche, eroded---	95	Not limited		Not limited		Not limited	
WeC:							
Weesatche-----------	95	Not limited		Not limited		Not limited	
WoA:							
Woodsboro-----------	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
						Depth to saturated zone	1.00
						Droughty	1.00
						Salinity	0.13
WyA:							
Wyick---------------	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too sandy	0.16	Too sandy	0.16	Sodium content	1.00
ZaA:							
Zalco---------------	95	Very limited		Very limited		Somewhat limited	
		Too sandy	1.00	Too sandy	1.00	Flooding	0.60
						Too sandy	0.50
						Droughty	0.34
ZcA:							
Zalco---------------	95	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Too sandy	0.50
						Droughty	0.34
ZkA:							
Zunker--------------	85	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
ZnA:							
Zunker--------------	90	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00

Table 18.--Dwellings and Small Commercial Buildings

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AnA:							
Ander	85	Very limited		Not limited		Very limited	
		Shrink-swell	1.00			Shrink-swell	1.00
AnB:							
Ander	85	Not limited		Not limited		Not limited	
BnB:							
Blanconia	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
BsA:							
Buchel	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
BuA:							
Buchel	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
CnA:							
Cieno	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.27	Shrink-swell	0.82	Shrink-swell	0.27
CrA:							
Clareville	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
CrB:							
Clareville	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
CsC:							
Colibro	85	Not limited		Not limited		Not limited	
CsD:							
Colibro	85	Not limited		Not limited		Somewhat limited	
						Slope	0.50
CyB:							
Coy	94	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00

Table 18.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
CyC:							
Coy	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
DaA:							
Dacosta	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
DAMS:							
Dams	100	Not rated		Not rated		Not rated	
DcA:							
Dacosta	60	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Contee	30	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.39	Shrink-swell	1.00	Depth to saturated zone	0.39
DeC:							
Devine	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.78	Shrink-swell	0.78	Shrink-swell	0.78
DUMPS:							
Dumps, dumps	100	Not rated		Not rated		Not rated	
EbA:							
Edna	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
EdA:							
Edroy	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
EnB:							
Elmendorf	50	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Denhawken	45	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
FdA:							
Faddin	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
GdB:							
Goliad	86	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 18.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
GoB:							
Goliad	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
GrA:							
Greta	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
ImA:							
Imogene	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
InA:							
Inari	85	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.01			Shrink-swell	0.01
InB:							
Inari	85	Somewhat limited		Not limited		Very limited	
		Shrink-swell	0.99			Shrink-swell	0.99
KyB:							
Kuy	95	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.61		
LaA:							
Laewest	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
LaB:							
Laewest	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
LaD:							
Laewest, eroded	80	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.50
LmB:							
Leming	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.90	Depth to saturated zone	1.00	Depth to saturated zone	0.90
				Shrink-swell	0.50		
MbB:							
Milby	90	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
				Shrink-swell	0.50		
MeA:							
Meguin	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
MgA:							
Meguin	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00

Table 18.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
MoA:							
Monteola	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
MoB:							
Monteola	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
MoC:							
Monteola	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
NuC:							
Nusil	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
OdA:							
Odem	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Riverwash	45	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.90		
OmD:							
Olmedo	90	Not limited		Not limited		Somewhat limited	
						Slope	0.12
OrA:							
Orelia	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PaB:							
Papalote	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PbA:							
Papalote	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PbB:							
Papalote	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PITS:							
Pits, borrow	100	Not rated		Not rated		Not rated	
PrB:							
Parrita	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PtC:							
Pernitas	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PuC:							
Pettus	85	Not limited		Not limited		Not limited	

Table 18.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
RaB:							
Raisin	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.01	Shrink-swell	0.01	Shrink-swell	0.01
RaC:							
Raisin	95	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.01			Slope	0.12
						Shrink-swell	0.01
RaC2:							
Raisin	90	Somewhat limited		Very limited		Very limited	
		Shrink-swell	0.99	Shrink-swell	1.00	Shrink-swell	0.99
RnB:							
Raisin	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.86	Shrink-swell	1.00	Shrink-swell	0.86
RoA:							
Realitos	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
RsC:							
Rhymes	95	Not limited		Not limited		Not limited	
RuB:							
Runge	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
RyA:							
Rydolph	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.82	Shrink-swell	0.50
				Shrink-swell	0.50		
ScB:							
Sarco	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.01	Shrink-swell	0.04	Shrink-swell	0.01
SnC:							
Sarnosa	95	Not limited		Not limited		Not limited	
SnD:							
Sarnosa	95	Not limited		Not limited		Somewhat limited	
						Slope	0.88
StC:							
Schattel	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
SwA:							
Sinton	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00

Table 18.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
TeA:							
Telferner	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
TeB:							
Telferner	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
ToA:							
Tiocano	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
UsB:							
Ustarents	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
VdA:							
Vidauri	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.44	Shrink-swell	0.44	Shrink-swell	0.44
VwA:							
Vidauri	55	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.44			Shrink-swell	0.44
Wyick	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.08			Shrink-swell	0.08
W:							
Water	100	Not rated		Not rated		Not rated	
WcC:							
Weesatche	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
WeA:							
Weesatche	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
WeB:							
Weesatche	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.56	Shrink-swell	0.08	Shrink-swell	0.56

Table 18.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
WeB2:							
Weesatche, eroded---	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.56	Shrink-swell	0.08	Shrink-swell	0.56
WeC:							
Weesatche-----------	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.56	Shrink-swell	0.08	Shrink-swell	0.56
WoA:							
Woodsboro-----------	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
WyA:							
Wyick---------------	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.08			Shrink-swell	0.08
ZaA:							
Zalco---------------	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
ZcA:							
Zalco---------------	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
ZkA:							
Zunker--------------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
ZnA:							
Zunker--------------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00

Table 19.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
AnA:							
Ander	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00	Too clayey	0.01		
AnB:							
Ander	85	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
BnB:							
Blanconia	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50	Too clayey	0.03		
BsA:							
Buchel	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Flooding	1.00	Too clayey	0.99	Sodium content	1.00
		Low strength	1.00	Flooding	0.60	Flooding	0.60
BuA:							
Buchel	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Flooding	1.00
		Flooding	1.00	Too clayey	0.99	Too clayey	1.00
		Low strength	1.00	Flooding	0.80	Sodium content	1.00
CnA:							
Cieno	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.27				
CrA:							
Clareville	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00	Too clayey	0.01		
		Flooding	0.40				
CrB:							
Clareville	95	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00	Too clayey	0.02		
CsC:							
Colibro	85	Not limited		Somewhat limited		Very limited	
				Cutbanks cave	0.10	Carbonate content	1.00

Table 19.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CsD:							
Colibro	85	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Cutbanks cave	0.10	Carbonate content	1.00
CyB:							
Coy	94	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	1.00	Cutbanks cave	0.10		
CyC:							
Coy	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	1.00	Cutbanks cave	0.10		
DaA:							
Dacosta	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
DAMS:							
Dams	100	Not rated		Not rated		Not rated	
DcA:							
Dacosta	60	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
Contee	30	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Shrink-swell	1.00	Cutbanks cave	1.00		
		Depth to saturated zone	0.19	Too clayey	0.50		
DeC:							
Devine	90	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.78	Cutbanks cave	1.00	Gravel	0.94
				Too clayey	0.03	Droughty	0.42
DUMPS:							
Dumps, dumps	100	Not rated		Not rated		Not rated	
EbA:							
Edna	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00	Cutbanks cave	0.10		
EdA:							
Edroy	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Shrink-swell	1.00	Too clayey	0.03		

Table 19.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EnB:							
Elmendorf	50	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Cutbanks cave	0.10	Sodium content	1.00
		Shrink-swell	1.00	Too clayey	0.02		
Denhawken	45	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
FdA:							
Faddin	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.27		
		Shrink-swell	1.00	Cutbanks cave	0.10		
GdB:							
Goliad	86	Somewhat limited		Not limited		Very limited	
		Low strength	0.78			Carbonate content	1.00
		Shrink-swell	0.50			Droughty	0.15
GoB:							
Goliad	95	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Cutbanks cave	0.10	Carbonate content	1.00
		Shrink-swell	0.50			Depth to cemented pan	0.03
GrA:							
Greta	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
				Cutbanks cave	0.10	Depth to saturated zone	1.00
ImA:							
Imogene	95	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Cutbanks cave	0.10	Sodium content	1.00
		Low strength	0.22			Droughty	0.01
InA:							
Inari	85	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.01	Cutbanks cave	0.10		
InB:							
Inari	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.99				
KyB:							
Kuy	95	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.09
				Depth to saturated zone	0.61		
LaA:							
Laewest	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.88	Sodium content	1.00

Table 19.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LaB:							
Laewest	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.88		
LaD:							
Laewest, eroded	80	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.50		
LmB:							
Leming	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.60	Depth to saturated zone	1.00	Depth to saturated zone	0.60
				Cutbanks cave	1.00		
				Too clayey	0.06		
MbB:							
Milby	90	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.19	Depth to saturated zone	1.00	Depth to saturated zone	0.19
				Cutbanks cave	1.00	Droughty	0.15
MeA:							
Meguin	95	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too clayey	0.61	Flooding	0.60
		Low strength	1.00	Flooding	0.60		
				Cutbanks cave	0.10		
MgA:							
Meguin	95	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.80	Flooding	1.00
		Low strength	1.00	Cutbanks cave	0.10		
MoA:							
Monteola	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.50		
MoB:							
Monteola	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.50		
MoC:							
Monteola	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.50		
NuC:							
Nusil	90	Somewhat limited		Very limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	1.00		

Table 19.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
OdA:							
Odem	50	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Cutbanks cave	0.10		
Riverwash	45	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Depth to saturated zone	0.90	Flooding	1.00
				Flooding	0.80	Droughty	0.69
				Cutbanks cave	0.10		
OmD:							
Olmedo	90	Not limited		Somewhat limited		Very limited	
				Cutbanks cave	0.10	Depth to cemented pan	1.00
						Droughty	1.00
						Carbonate content	1.00
						Gravel	1.00
						Large stones	0.01
OrA:							
Orelia	90	Somewhat limited		Somewhat limited		Very limited	
		Low strength	0.78	Cutbanks cave	0.10	Sodium content	1.00
		Shrink-swell	0.50				
PaB:							
Papalote	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
PbA:							
Papalote	95	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
PbB:							
Papalote	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
PITS:							
Pits, borrow	100	Not rated		Not rated		Not rated	
PrB:							
Parrita	85	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Cutbanks cave	0.10	Depth to cemented pan	1.00
						Carbonate content	1.00
						Droughty	0.76
PtC:							
Pernitas	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
PuC:							
Pettus	85	Not limited		Very limited		Very limited	
				Cutbanks cave	1.00	Carbonate content	1.00
						Droughty	0.13

Table 19.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
RaB:							
Raisin--------------	95	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.01	Cutbanks cave	0.10		
RaC:							
Raisin--------------	95	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.01	Cutbanks cave	0.10		
RaC2:							
Raisin--------------	90	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.99	Cutbanks cave	0.10		
RnB:							
Raisin--------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.86	Cutbanks cave	0.10		
RoA:							
Realitos------------	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.50		
RsC:							
Rhymes--------------	95	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.42
RuB:							
Runge---------------	95	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
RyA:							
Rydolph-------------	85	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Depth to saturated zone	0.82	Flooding	1.00
		Low strength	1.00	Flooding	0.80	Sodium content	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Too clayey	1.00
ScB:							
Sarco---------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
		Shrink-swell	0.01	Cutbanks cave	0.10	Depth to saturated zone	1.00
						Sodium content	1.00
SnC:							
Sarnosa-------------	95	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
SnD:							
Sarnosa-------------	95	Not limited		Somewhat limited		Very limited	
				Cutbanks cave	0.10	Carbonate content	1.00

Table 19.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StC:							
Schattel	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	1.00	Cutbanks cave	0.10		
SwA:							
Sinton	95	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
				Cutbanks cave	0.10		
TeA:							
Telferner	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Low strength	1.00	Too clayey	0.04		
TeB:							
Telferner	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00	Too clayey	0.03		
ToA:							
Tiocano	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.50		
UsB:							
Ustarents	95	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
VdA:							
Vidauri	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.44				
VwA:							
Vidauri	55	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.44				
Wyick	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10	Sodium content	1.00
		Shrink-swell	0.08				

Table 19.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
W:							
Water	100	Not rated		Not rated		Not rated	
WcC:							
Weesatche	85	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
WeA:							
Weesatche	90	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Cutbanks cave	0.10	Carbonate content	1.00
WeB:							
Weesatche	95	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.56	Cutbanks cave	0.10		
WeB2:							
Weesatche, eroded	95	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.56	Cutbanks cave	0.10		
		Low strength	0.22				
WeC:							
Weesatche	95	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.56	Cutbanks cave	0.10		
WoA:							
Woodsboro	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10	Depth to saturated zone	1.00
		Low strength	1.00			Droughty	1.00
		Flooding	0.40			Salinity	0.13
WyA:							
Wyick	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10	Sodium content	1.00
		Shrink-swell	0.08				
ZaA:							
Zalco	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
				Flooding	0.60	Too sandy	0.50
						Droughty	0.34
ZcA:							
Zalco	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	1.00
				Flooding	0.80	Too sandy	0.50
						Droughty	0.34
ZkA:							
Zunker	85	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
				Flooding	0.60		

Table 19.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ZnA:							
Zunker---------------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	1.00
				Flooding	0.80		

Table 20.--Sewage Disposal

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AnA:					
Ander	85	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
AnB:					
Ander	85	Very limited		Not limited	
		Slow water movement	1.00		
BnB:					
Blanconia	85	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	1.00
BsA:					
Buchel	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00		
BuA:					
Buchel	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00		
CnA:					
Cieno	95	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
CrA:					
Clareville	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
CrB:					
Clareville	95	Very limited		Not limited	
		Slow water movement	1.00		

Table 20.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
CsC:					
Colibro	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.32
CsD:					
Colibro	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.92
CyB:					
Coy	94	Very limited		Not limited	
		Slow water movement	1.00		
CyC:					
Coy	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.32
DaA:					
Dacosta	90	Very limited		Not limited	
		Slow water movement	1.00		
DAMS:					
Dams	100	Not rated		Not rated	
DcA:					
Dacosta	60	Very limited		Not limited	
		Slow water movement	1.00		
Contee	30	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
DeC:					
Devine	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
DUMPS:					
Dumps, dumps	100	Not rated		Not rated	
EbA:					
Edna	95	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		

Table 20.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
EdA:					
Edroy	95	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
EnB:					
Elmendorf	50	Very limited		Not limited	
		Slow water movement	1.00		
Denhawken	45	Very limited		Not limited	
		Slow water movement	1.00		
FdA:					
Faddin	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
GdB:					
Goliad	86	Very limited		Not limited	
		Slow water movement	1.00		
GoB:					
Goliad	95	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	1.00	Seepage	0.50
GrA:					
Greta	85	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
ImA:					
Imogene	95	Very limited		Not limited	
		Slow water movement	1.00		
InA:					
Inari	85	Very limited		Not limited	
		Slow water movement	1.00		
InB:					
Inari	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50

Table 20.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
KyB:					
Kuy	95	Somewhat limited		Very limited	
		Depth to saturated zone	0.99	Seepage	1.00
		Slow water movement	0.50		
LaA:					
Laewest	95	Very limited		Not limited	
		Slow water movement	1.00		
LaB:					
Laewest	95	Very limited		Not limited	
		Slow water movement	1.00		
LaD:					
Laewest, eroded	80	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.92
LmB:					
Leming	85	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.98
MbB:					
Milby	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	0.46	Depth to saturated zone	0.75
MeA:					
Meguin	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	0.50	Seepage	0.50
MgA:					
Meguin	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	0.50	Seepage	0.50
MoA:					
Monteola	95	Very limited		Not limited	
		Slow water movement	1.00		
MoB:					
Monteola	85	Very limited		Not limited	
		Slow water movement	1.00		

Table 20.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MoC:					
Monteola------------	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.32
NuC:					
Nusil---------------	90	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
				Slope	0.08
OdA:					
Odem----------------	50	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Flooding	0.40	Flooding	0.40
Riverwash-----------	45	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00		
OmD:					
Olmedo--------------	90	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Slope	0.68
				Seepage	0.50
OrA:					
Orelia--------------	90	Very limited		Not limited	
		Slow water movement	1.00		
PaB:					
Papalote------------	90	Very limited		Not limited	
		Slow water movement	1.00		
PbA:					
Papalote------------	95	Very limited		Not limited	
		Slow water movement	1.00		
PbB:					
Papalote------------	90	Very limited		Not limited	
		Slow water movement	1.00		
PITS:					
Pits, borrow--------	100	Not rated		Not rated	

Table 20.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
PrB:					
Parrita-------------	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	0.50
PtC:					
Pernitas------------	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.32
PuC:					
Pettus--------------	85	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50	Slope	0.32
RaB:					
Raisin--------------	95	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
RaC:					
Raisin--------------	95	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.68
				Seepage	0.50
RaC2:					
Raisin--------------	90	Very limited		Somewhat limited	
		Slow water movement	0.99	Seepage	0.92
				Slope	0.08
RnB:					
Raisin--------------	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.99	Seepage	0.92
RoA:					
Realitos------------	90	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00		
RsC:					
Rhymes--------------	95	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
				Slope	0.08

Table 20.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
RuB:					
Runge	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
RyA:					
Rydolph	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	0.99
		Depth to saturated zone	1.00		
ScB:					
Sarco	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
SnC:					
Sarnosa	95	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50	Slope	0.08
SnD:					
Sarnosa	95	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50	Slope	1.00
StC:					
Schattel	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
				Slope	0.08
SwA:					
Sinton	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	0.50	Seepage	0.50
TeA:					
Telferner	90	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		

Table 20.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
TeB:					
Telferner	95	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
ToA:					
Tiocano	85	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
		Seepage, bottom layer	1.00		
UsB:					
Ustarents	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.32
VdA:					
Vidauri	85	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
VwA:					
Vidauri	55	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
Wyick	40	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
W:					
Water	100	Not rated		Not rated	
WcC:					
Weesatche	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50

Table 20.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
WeA:					
Weesatche-----------	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
WeB:					
Weesatche-----------	95	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	0.99
WeB2:					
Weesatche, eroded---	95	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	0.99
WeC:					
Weesatche-----------	95	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	0.99
				Slope	0.18
WoA:					
Woodsboro-----------	95	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	0.40
		Flooding	0.40		
WyA:					
Wyick---------------	85	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
ZaA:					
Zalco---------------	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00		
ZcA:					
Zalco---------------	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00		
ZkA:					
Zunker--------------	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00

Table 20.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
ZnA:					
Zunker----------------	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00

Table 21.--Landfills

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
AnA:							
Ander	85	Not limited		Not limited		Not limited	
AnB:							
Ander	85	Not limited		Not limited		Somewhat limited	
						Too clayey	0.50
BnB:							
Blanconia	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
BsA:							
Buchel	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
		Excess sodium	1.00			Sodium content	1.00
BuA:							
Buchel	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
		Excess sodium	1.00			Sodium content	1.00
CnA:							
Cieno	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Too clayey	0.50
CrA:							
Clareville	90	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Too clayey	1.00
CrB:							
Clareville	95	Not limited		Not limited		Not limited	
CsC:							
Colibro	85	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Carbonate content	1.00
						Seepage	0.50
CsD:							
Colibro	85	Very limited		Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50

Table 21.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Trench sanitary landfill: Value	Area sanitary landfill: Rating class and limiting features	Area sanitary landfill: Value	Daily cover for landfill: Rating class and limiting features	Daily cover for landfill: Value
CyB:							
Coy	94	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
CyC:							
Coy	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
DaA:							
Dacosta	90	Not limited		Not limited		Very limited	
						Hard to compact	1.00
						Too clayey	0.50
DAMS:							
Dams	100	Not rated		Not rated		Not rated	
DcA:							
Dacosta	60	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
Contee	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
						Depth to saturated zone	0.86
DeC:							
Devine	90	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Gravel content	0.77
DUMPS:							
Dumps, dumps	100	Not rated		Not rated		Not rated	
EbA:							
Edna	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Too clayey	1.00
EdA:							
Edroy	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
EnB:							
Elmendorf	50	Very limited		Not limited		Very limited	
		Excess sodium	1.00			Sodium content	1.00
		Too clayey	0.50			Too clayey	0.50

Table 21.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Denhawken-----------	45	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
FdA:							
Faddin--------------	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
GdB:							
Goliad--------------	86	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
GoB:							
Goliad--------------	95	Somewhat limited		Very limited		Very limited	
		Too clayey	0.50	Depth to cemented pan	1.00	Depth to cemented pan	1.00
						Too clayey	0.50
GrA:							
Greta---------------	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	1.00			Sodium content	1.00
ImA:							
Imogene-------------	95	Very limited		Not limited		Very limited	
		Excess sodium	1.00			Sodium content	1.00
InA:							
Inari---------------	85	Not limited		Not limited		Not limited	
InB:							
Inari---------------	85	Not limited		Not limited		Not limited	
KyB:							
Kuy-----------------	95	Very limited		Very limited		Very limited	
		Too sandy	1.00	Seepage	1.00	Too sandy	1.00
						Seepage	1.00
LaA:							
Laewest-------------	95	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
		Excess sodium	1.00			Hard to compact	1.00
						Sodium content	1.00
LaB:							
Laewest-------------	95	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
LaD:							
Laewest, eroded-----	80	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00

Table 21.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
LmB:							
Leming	85	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Seepage	1.00	Depth to saturated zone	0.99
				Depth to saturated zone	0.98	Too clayey	0.50
MbB:							
Milby	90	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.99	Seepage	1.00	Depth to saturated zone	0.86
				Depth to saturated zone	0.75		
MeA:							
Meguin	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Too clayey	0.50				
MgA:							
Meguin	95	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
MoA:							
Monteola	95	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
MoB:							
Monteola	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
MoC:							
Monteola	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
NuC:							
Nusil	90	Not limited		Very limited		Not limited	
				Seepage	1.00		
OdA:							
Odem	50	Very limited		Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
		Flooding	0.40	Flooding	0.40		
Riverwash	45	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.02
		Seepage, bottom layer	1.00	Not rated	1.00		
				Seepage	1.00		

Table 21.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
OmD:							
Olmedo--------------	90	Not limited		Very limited		Very limited	
				Depth to cemented pan	1.00	Depth to cemented pan	1.00
						Gravel content	1.00
						Carbonate content	1.00
OrA:							
Orelia--------------	90	Very limited		Not limited		Very limited	
		Excess sodium	1.00			Sodium content	1.00
PaB:							
Papalote------------	90	Not limited		Not limited		Not limited	
PbA:							
Papalote------------	95	Not limited		Not limited		Not limited	
PbB:							
Papalote------------	90	Not limited		Not limited		Not limited	
PITS:							
Pits, borrow--------	100	Not rated		Not rated		Not rated	
PrB:							
Parrita-------------	85	Not limited		Very limited		Very limited	
				Depth to cemented pan	1.00	Depth to cemented pan	1.00
PtC:							
Pernitas------------	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
PuC:							
Pettus--------------	85	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Carbonate content	1.00
						Gravel content	0.86
						Seepage	0.21
RaB:							
Raisin--------------	95	Not limited		Not limited		Not limited	
RaC:							
Raisin--------------	95	Not limited		Not limited		Not limited	
RaC2:							
Raisin--------------	90	Not limited		Not limited		Not limited	
RnB:							
Raisin--------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
RoA:							
Realitos------------	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00

Table 21.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
RsC:							
Rhymes	95	Very limited		Very limited		Very limited	
		Too sandy	1.00	Seepage	1.00	Too sandy	1.00
						Seepage	1.00
RuB:							
Runge	95	Not limited		Not limited		Not limited	
RyA:							
Rydolph	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Sodium content	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Excess sodium	1.00			Too clayey	0.50
		Too clayey	0.50				
ScB:							
Sarco	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	1.00			Sodium content	1.00
SnC:							
Sarnosa	95	Very limited		Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
SnD:							
Sarnosa	95	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Carbonate content	1.00
						Seepage	0.50
StC:							
Schattel	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
SwA:							
Sinton	95	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
TeA:							
Telferner	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
TeB:							
Telferner	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Too clayey	0.50

Table 21.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
ToA:							
Tiocano	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00			Too clayey	0.50
		Too clayey	0.50				
UsB:							
Ustarents	95	Not limited		Not limited		Not limited	
VdA:							
Vidauri	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
VwA:							
Vidauri	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Wyick	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
W:							
Water	100	Not rated		Not rated		Not rated	
WcC:							
Weesatche	85	Not limited		Not limited		Not limited	
WeA:							
Weesatche	90	Not limited		Not limited		Very limited	
						Carbonate content	1.00
WeB:							
Weesatche	95	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
WeB2:							
Weesatche, eroded	95	Not limited		Not limited		Not limited	
WeC:							
Weesatche	95	Not limited		Not limited		Not limited	

Table 21.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WoA:							
Woodsboro-----------	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Excess sodium	1.00	Flooding	0.40	Sodium content	1.00
		Flooding	0.40			Too clayey	1.00
WyA:							
Wyick---------------	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
ZaA:							
Zalco---------------	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too sandy	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	1.00				
ZcA:							
Zalco---------------	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too sandy	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	1.00				
ZkA:							
Zunker--------------	85	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.50
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	0.50
		Too sandy	0.50				
ZnA:							
Zunker--------------	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.50
		Seepage, bottom layer	1.00	Seepage	1.00		

Table 22.--Source of Gravel and Sand

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
AnA:					
Ander	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AnB:					
Ander	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BnB:					
Blanconia	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BsA:					
Buchel	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BuA:					
Buchel	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CnA:					
Cieno	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CrA:					
Clareville	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CrB:					
Clareville	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CsC:					
Colibro	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CsD:					
Colibro	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 22.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
CyB:					
Coy	94	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CyC:					
Coy	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DaA:					
Dacosta	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DAMS:					
Dams	100	Not rated		Not rated	
DcA:					
Dacosta	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Contee	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DeC:					
Devine	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DUMPS:					
Dumps, dumps	100	Not rated		Not rated	
EbA:					
Edna	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EdA:					
Edroy	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EnB:					
Elmendorf	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Denhawken	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 22.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
FdA:					
Faddin	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GdB:					
Goliad	86	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GoB:					
Goliad	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GrA:					
Greta	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ImA:					
Imogene	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
InA:					
Inari	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
InB:					
Inari	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KyB:					
Kuy	95	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.15
LaA:					
Laewest	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LaB:					
Laewest	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LaD:					
Laewest, eroded	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LmB:					
Leming	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.15

Table 22.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
MbB:					
Milby	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.17
MeA:					
Meguin	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MgA:					
Meguin	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MoA:					
Monteola	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MoB:					
Monteola	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MoC:					
Monteola	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NuC:					
Nusil	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.07
OdA:					
Odem	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.11
		Thickest layer	0.00	Bottom layer	0.15
Riverwash	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.04
OmD:					
Olmedo	90	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.57	Thickest layer	0.00
OrA:					
Orelia	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PaB:					
Papalote	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 22.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
PbA:					
Papalote	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PbB:					
Papalote	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
PITS:					
Pits, borrow	100	Not rated		Not rated	
PrB:					
Parrita	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
PtC:					
Pernitas	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PuC:					
Pettus	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RaB:					
Raisin	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RaC:					
Raisin	95	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.02
		Thickest layer	0.00	Bottom layer	0.03
RaC2:					
Raisin	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RnB:					
Raisin	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
RoA:					
Realitos	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RsC:					
Rhymes	95	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.12

Table 22.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
RuB:					
Runge	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RyA:					
Rydolph	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ScB:					
Sarco	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.06
SnC:					
Sarnosa	95	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.04
SnD:					
Sarnosa	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
StC:					
Schattel	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SwA:					
Sinton	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TeA:					
Telferner	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TeB:					
Telferner	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ToA:					
Tiocano	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
UsB:					
Ustarents	95	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.01
VdA:					
Vidauri	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 22.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
VwA:					
Vidauri	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Wyick	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
W:					
Water	100	Not rated		Not rated	
WcC:					
Weesatche	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WeA:					
Weesatche	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
WeB:					
Weesatche	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WeB2:					
Weesatche, eroded	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WeC:					
Weesatche	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WoA:					
Woodsboro	95	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
WyA:					
Wyick	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ZaA:					
Zalco	95	Poor		Good	
		Bottom layer	0.00	Thickest layer	0.98
		Thickest layer	0.00	Bottom layer	0.99
ZcA:					
Zalco	95	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.99
		Thickest layer	0.00		

Table 22.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
ZkA:					
Zunker---------------	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.08
ZnA:					
Zunker---------------	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.08

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AnA:							
Ander	85	Poor		Fair		Poor	
		Too clayey	0.00	Low strength	0.22	Too clayey	0.00
		Organic matter content low	0.18	Shrink-swell	0.88		
		Too acid	0.99				
AnB:							
Ander	85	Fair		Fair		Fair	
		Organic matter content low	0.18	Low strength	0.22	Too clayey	0.29
		Too clayey	0.50	No shrink-swell limitation	0.99		
		Too acid	0.99				
BnB:							
Blanconia	85	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness depth	0.00	Wetness depth	0.00
		Too clayey	0.00	Shrink-swell	0.92	Too clayey	0.00
		Organic matter content low	0.01			Sodium content	0.98
		Too acid	0.61				
		Water erosion	0.90				
BsA:							
Buchel	95	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Sodium content	0.10	Low strength	0.00	Sodium content	0.10
		Carbonate content	0.32			Carbonate content	0.41
		Organic matter content low	0.48				
BuA:							
Buchel	85	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Sodium content	0.10	Low strength	0.00	Sodium content	0.10
		Carbonate content	0.32			Carbonate content	0.40
		Organic matter content low	0.84				
CnA:							
Cieno	95	Fair		Poor		Poor	
		Organic matter content low	0.01	Wetness depth	0.00	Wetness depth	0.00
		Too acid	0.50	Low strength	0.22	Too clayey	0.40
		Too clayey	0.61	Shrink-swell	0.86		
CrA:							
Clareville	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Carbonate content	0.97	Shrink-swell	0.12		

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CrB:							
Clareville----------	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Carbonate content	0.99	Shrink-swell	0.12		
CsC:							
Colibro-------------	85	Poor		Good		Poor	
		Carbonate content	0.00			Carbonate content	0.00
		Organic matter content low	0.88				
CsD:							
Colibro-------------	85	Poor		Poor		Poor	
		Carbonate content	0.00	Low strength	0.00	Carbonate content	0.00
		Organic matter content low	0.88				
		Water erosion	0.99				
CyB:							
Coy-----------------	94	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Sodium content	0.22	Shrink-swell	0.12	Sodium content	0.22
		Organic matter content low	0.68			Salinity	0.88
CyC:							
Coy-----------------	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.68	Shrink-swell	0.12	Sodium content	0.22
						Salinity	0.88
DaA:							
Dacosta-------------	90	Fair		Poor		Fair	
		Organic matter content low	0.01	Low strength	0.00	Too clayey	0.06
		Too clayey	0.09	Shrink-swell	0.12		
		Water erosion	0.99				
DAMS:							
Dams----------------	100	Not rated		Not rated		Not rated	
DcA:							
Dacosta-------------	60	Fair		Poor		Fair	
		Too clayey	0.09	Low strength	0.00	Too clayey	0.06
		Organic matter content low	0.82	Shrink-swell	0.13	Sodium content	0.90
		Sodium content	0.90				
Contee--------------	30	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.88	Shrink-swell	0.12	Wetness depth	0.53
		Carbonate content	0.92	Wetness depth	0.53	Rock fragments	0.82
						Carbonate content	0.95

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DeC:							
Devine	90	Poor		Fair		Poor	
		Carbonate content	0.00	Shrink-swell	0.92	Rock fragments	0.00
		Too clayey	0.00			Too clayey	0.00
		Droughty	0.33				
		Organic matter content low	0.88				
DUMPS:							
Dumps, dumps	100	Not rated		Not rated		Not rated	
EbA:							
Edna	95	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Wetness depth	0.00
		Water erosion	0.90	Low strength	0.00	Too clayey	0.00
		Too acid	0.97	Shrink-swell	0.12		
EdA:							
Edroy	95	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Too clayey	0.00
				Low strength	0.00	Wetness depth	0.00
				Shrink-swell	0.12		
EnB:							
Elmendorf	50	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.88	Shrink-swell	0.12		
		Carbonate content	0.92				
Denhawken	45	Fair		Poor		Fair	
		Too clayey	0.07	Low strength	0.00	Too clayey	0.06
				Shrink-swell	0.12		
FdA:							
Faddin	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Water erosion	0.90	Shrink-swell	0.77		
		Too acid	0.97				
GdB:							
Goliad	86	Poor		Fair		Poor	
		Carbonate content	0.00	Low strength	0.22	Too clayey	0.00
		Too clayey	0.00			Carbonate content	0.97
		Droughty	0.05				
		Organic matter content low	0.88				

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
GoB:							
Goliad	95	Poor		Poor		Fair	
		Carbonate content	0.00	Depth to cemented pan	0.00	Too clayey	0.08
		Too clayey	0.14	Low strength	0.00	Depth to cemented pan	0.97
		Organic matter content low	0.18	Shrink-swell	0.87	Carbonate content	0.97
		Droughty	0.55				
		Depth to cemented pan	0.97				
GrA:							
Greta	85	Poor		Poor		Poor	
		Sodium content	0.00	Wetness depth	0.00	Wetness depth	0.00
		Water erosion	0.99			Sodium content	0.00
ImA:							
Imogene	95	Poor		Fair		Poor	
		Sodium content	0.00	Low strength	0.78	Sodium content	0.00
		Organic matter content low	0.50	Shrink-swell	0.87	Too clayey	0.72
		Water erosion	0.90				
		Carbonate content	0.92				
		Too clayey	0.99				
InA:							
Inari	85	Fair		Fair		Good	
		Organic matter content low	0.02	Shrink-swell	0.99		
		Too acid	0.97				
InB:							
Inari	85	Fair		Fair		Fair	
		Organic matter content low	0.02	Shrink-swell	0.87	Too clayey	0.59
		Too clayey	0.97				
		Too acid	0.99				
KyB:							
Kuy	95	Poor		Good		Poor	
		Wind erosion	0.00			Too sandy	0.00
		Too sandy	0.00				
		Organic matter content low	0.12				
LaA:							
Laewest	95	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Carbonate content	0.92	Low strength	0.00		
		Too acid	0.95				
LaB:							
Laewest	95	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Too acid	0.95	Low strength	0.00		

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
LaD:							
Laewest, eroded	80	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
				Low strength	0.00		
LmB:							
Leming	85	Poor		Poor		Poor	
		Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
		Too sandy	0.00	Wetness depth	0.22	Wetness depth	0.22
		Organic matter content low	0.02	Shrink-swell	0.99		
MbB:							
Milby	90	Poor		Fair		Poor	
		Too sandy	0.00	Wetness depth	0.53	Too sandy	0.00
		Wind erosion	0.00	Shrink-swell	0.99	Wetness depth	0.53
		Organic matter content low	0.08				
		Too acid	0.80				
MeA:							
Meguin	95	Fair		Poor		Fair	
		Carbonate content	0.46	Low strength	0.00	Carbonate content	0.63
		Water erosion	0.68				
		Organic matter content low	0.88				
MgA:							
Meguin	95	Fair		Poor		Fair	
		Carbonate content	0.46	Low strength	0.00	Carbonate content	0.57
		Water erosion	0.68				
		Organic matter content low	0.88				
MoA:							
Monteola	95	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Organic matter content low	0.88	Low strength	0.00		
		Water erosion	0.99				
MoB:							
Monteola	85	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Organic matter content low	0.88	Low strength	0.00		
		Water erosion	0.99				
MoC:							
Monteola	85	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Organic matter content low	0.88	Low strength	0.00		
		Water erosion	0.99				

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NuC:							
Nusil----------------	90	Poor		Fair		Poor	
		Wind erosion	0.00	Shrink-swell	0.97	Too sandy	0.00
		Too sandy	0.00				
		Organic matter content low	0.60				
		Too acid	0.95				
OdA:							
Odem-----------------	50	Fair		Good		Fair	
		Too sandy	0.46			Too sandy	0.46
Riverwash------------	45	Poor		Good		Good	
		Wind erosion	0.00				
		Organic matter content low	0.12				
		Droughty	0.98				
OmD:							
Olmedo---------------	90	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Carbonate content	0.00
		Carbonate content	0.00			Rock fragments	0.00
		Depth to cemented pan	0.00			Depth to cemented pan	0.00
OrA:							
Orelia---------------	90	Fair		Fair		Fair	
		Organic matter content low	0.88	Shrink-swell	0.87	Too clayey	0.70
		Too clayey	0.98				
PaB:							
Papalote-------------	90	Poor		Poor		Fair	
		Wind erosion	0.00	Low strength	0.00	Too clayey	0.05
		Too clayey	0.08	Shrink-swell	0.87		
		Organic matter content low	0.18				
		Too acid	0.95				
		Water erosion	0.99				
PbA:							
Papalote-------------	95	Fair		Fair		Fair	
		Organic matter content low	0.18	Shrink-swell	0.87	Too clayey	0.30
		Too clayey	0.46				
		Too acid	0.84				
PbB:							
Papalote-------------	90	Fair		Fair		Fair	
		Organic matter content low	0.18	Shrink-swell	0.87	Too clayey	0.19
		Too clayey	0.29				
PITS:							
Pits, borrow---------	100	Not rated		Not rated		Not rated	

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PrB:							
Parrita	85	Poor		Poor		Poor	
		Carbonate content	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Shrink-swell	0.87		
		Droughty	0.00				
PtC:							
Pernitas	85	Fair		Poor		Fair	
		Carbonate content	0.08	Low strength	0.00	Too clayey	0.44
		Too clayey	0.56	Shrink-swell	0.89		
		Organic matter content low	0.92				
PuC:							
Pettus	85	Poor		Good		Poor	
		Carbonate content	0.00			Rock fragments	0.00
		Organic matter content low	0.60			Carbonate content	0.02
						Hard to reclaim (rock fragments)	0.05
RaB:							
Raisin	95	Poor		Good		Good	
		Wind erosion	0.00				
		Carbonate content	0.08				
		Organic matter content low	0.12				
		Too acid	0.97				
RaC:							
Raisin	95	Poor		Fair		Fair	
		Wind erosion	0.00	Shrink-swell	0.99	Hard to reclaim (rock fragments)	0.12
		Organic matter content low	0.16				
RaC2:							
Raisin	90	Poor		Fair		Fair	
		Wind erosion	0.00	Shrink-swell	0.50	Too clayey	0.56
		Organic matter content low	0.08				
		Not too clayey	0.99				
RnB:							
Raisin	90	Fair		Poor		Poor	
		Organic matter content low	0.08	Wetness depth	0.00	Wetness depth	0.00
				Shrink-swell	0.61		
RoA:							
Realitos	90	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
				Low strength	0.00		

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
RsC:							
Rhymes	95	Poor		Good		Poor	
		Wind erosion	0.00			Too sandy	0.00
		Too sandy	0.00				
		Organic matter content low	0.60				
RuB:							
Runge	95	Fair		Fair		Fair	
		Too clayey	0.77	Low strength	0.78	Too clayey	0.64
		Carbonate content	0.92	Shrink-swell	0.91		
RyA:							
Rydolph	85	Poor		Poor		Poor	
		Sodium content	0.00	Low strength	0.00	Sodium content	0.00
		Carbonate content	0.32	Shrink-swell	0.87	Carbonate content	0.97
		Water erosion	0.90				
ScB:							
Sarco	90	Poor		Poor		Poor	
		Wind erosion	0.00	Wetness depth	0.00	Wetness depth	0.00
		Organic matter content low	0.02	Shrink-swell	0.99	Sodium content	0.02
		Too acid	0.61			Too acid	0.99
		Sodium content	0.90				
SnC:							
Sarnosa	95	Fair		Good		Fair	
		Organic matter content low	0.60			Too sandy	0.62
		Too sandy	0.62			Carbonate content	0.70
		Carbonate content	0.68				
SnD:							
Sarnosa	95	Poor		Good		Poor	
		Carbonate content	0.00			Carbonate content	0.00
		Organic matter content low	0.60				
StC:							
Schattel	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Carbonate content	0.54	Shrink-swell	0.15	Carbonate content	0.88
		Organic matter content low	0.88			Sodium content	0.98
		Sodium content	0.97				
SwA:							
Sinton	95	Fair		Good		Good	
		Carbonate content	0.32				
TeA:							
Telferner	90	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Wetness depth	0.00
		Organic matter content low	0.18	Shrink-swell	0.60	Too clayey	0.00
		Water erosion	0.90				

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
TeB:							
Telferner	95	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Wetness depth	0.00
		Organic matter content low	0.18	Low strength	0.00	Too clayey	0.00
		Water erosion	0.90	Shrink-swell	0.46		
ToA:							
Tiocano	85	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Too clayey	0.00
		Carbonate content	0.92	Shrink-swell	0.00	Wetness depth	0.00
				Low strength	0.78		
UsB:							
Ustarents	95	Fair		Poor		Fair	
		Organic matter content low	0.18	Low strength	0.00	Too clayey	0.55
		Too clayey	0.92	Shrink-swell	0.87		
VdA:							
Vidauri	85	Fair		Poor		Poor	
		Organic matter content low	0.50	Wetness depth	0.00	Wetness depth	0.00
		Water erosion	0.68	Low strength	0.00	Too clayey	0.62
		Too acid	0.74	Shrink-swell	0.96		
		Too clayey	0.95				
VwA:							
Vidauri	55	Fair		Poor		Poor	
		Organic matter content low	0.05	Wetness depth	0.00	Wetness depth	0.00
		Water erosion	0.68	Low strength	0.00	Too clayey	0.62
		Too acid	0.74	Shrink-swell	0.98		
		Too clayey	0.95				
Wyick	40	Poor		Poor		Poor	
		Organic matter content low	0.00	Wetness depth	0.00	Wetness depth	0.00
		Sodium content	0.10	Low strength	0.00	Too clayey	0.63
		Too acid	0.61	Shrink-swell	0.99	Sodium content	0.78
		Water erosion	0.90				
		Too clayey	0.94				
W:							
Water	100	Not rated		Not rated		Not rated	
WcC:							
Weesatche	85	Poor		Fair		Fair	
		Carbonate content	0.00	Low strength	0.78	Too clayey	0.75
		Too clayey	0.90	Shrink-swell	0.87		
WeA:							
Weesatche	90	Poor		Fair		Good	
		Carbonate content	0.00	Shrink-swell	0.87		
		Organic matter content low	0.75				

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
WeB:							
Weesatche	95	Poor		Fair		Fair	
		Carbonate content	0.00	Shrink-swell	0.95	Too clayey	0.63
		Organic matter content low	0.58				
		Too clayey	0.63				
WeB2:							
Weesatche, eroded	95	Poor		Poor		Fair	
		Carbonate content	0.00	Low strength	0.00	Too clayey	0.68
		Organic matter content low	0.58	Shrink-swell	0.95		
		Too clayey	0.68				
WeC:							
Weesatche	95	Poor		Fair		Fair	
		Carbonate content	0.00	Shrink-swell	0.94	Too clayey	0.63
		Organic matter content low	0.58				
		Too clayey	0.63				
WoA:							
Woodsboro	95	Poor		Poor		Poor	
		Droughty	0.00	Wetness depth	0.00	Wetness depth	0.00
		Sodium content	0.00	Shrink-swell	0.12	Sodium content	0.00
		Too clayey	0.00			Too clayey	0.00
		Salinity	0.28			Salinity	0.88
		Organic matter content low	0.68				
WyA:							
Wyick	85	Poor		Poor		Poor	
		Organic matter content low	0.00	Wetness depth	0.00	Wetness depth	0.00
		Sodium content	0.10	Low strength	0.00	Too clayey	0.63
		Too acid	0.61	Shrink-swell	0.99	Sodium content	0.78
		Water erosion	0.90				
		Too clayey	0.94				
ZaA:							
Zalco	95	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Organic matter content low	0.18				
ZcA:							
Zalco	95	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Organic matter content low	0.18				

Table 23.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ZkA:							
Zunker---------------	85	Fair		Good		Fair	
		Too sandy	0.50			Too sandy	0.50
		Carbonate content	0.80			Carbonate content	0.84
		Organic matter content low	0.88				
ZnA:							
Zunker---------------	90	Fair		Good		Fair	
		Too sandy	0.50			Too sandy	0.50
		Carbonate content	0.80			Carbonate content	0.87
		Organic matter content low	0.88				

Table 24.--Ponds and Embankments

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
AnA:							
Ander	85	Not limited		Somewhat limited		Very limited	
				Piping	0.40	Depth to water	1.00
AnB:							
Ander	85	Not limited		Somewhat limited		Very limited	
				Piping	0.40	Depth to water	1.00
BnB:							
Blanconia	85	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Depth to water	1.00
				Piping	0.10		
BsA:							
Buchel	95	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Depth to water	1.00
BuA:							
Buchel	85	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Depth to water	1.00
CnA:							
Cieno	95	Not limited		Very limited		Somewhat limited	
				Ponding	1.00	Slow refill	0.97
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	0.06		
CrA:							
Clareville	90	Somewhat limited		Not limited		Very limited	
		Seepage	0.03			Depth to water	1.00
CrB:							
Clareville	95	Somewhat limited		Not limited		Very limited	
		Seepage	0.03			Depth to water	1.00
CsC:							
Colibro	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.10	Depth to water	1.00
		Slope	0.08				
CsD:							
Colibro	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.84	Depth to water	1.00
		Slope	0.68				
CyB:							
Coy	94	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Depth to water	1.00

Table 24.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CyC:							
Coy	85	Somewhat limited		Very limited		Very limited	
		Slope	0.08	Hard to pack	1.00	Depth to water	1.00
DaA:							
Dacosta	90	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Depth to water	1.00
DAMS:							
Dams	100	Not rated		Not rated		Not rated	
DcA:							
Dacosta	60	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Depth to water	1.00
Contee	30	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Slow refill	1.00
				Depth to saturated zone	0.99	Cutbanks cave	0.10
						Depth to saturated zone	0.01
DeC:							
Devine	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Seepage	0.48	Depth to water	1.00
				Piping	0.02		
DUMPS:							
Dumps, dumps	100	Not rated		Not rated		Not rated	
EbA:							
Edna	95	Not limited		Very limited		Somewhat limited	
				Depth to saturated zone	1.00	Slow refill	0.30
				Piping	0.10	Cutbanks cave	0.10
EdA:							
Edroy	95	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.53	Ponding	1.00	Slow refill	0.47
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Hard to pack	1.00		
EnB:							
Elmendorf	50	Not limited		Very limited		Very limited	
				Piping	1.00	Depth to water	1.00
Denhawken	45	Not limited		Somewhat limited		Very limited	
				Piping	0.40	Depth to water	1.00
FdA:							
Faddin	85	Not limited		Somewhat limited		Very limited	
				Piping	0.50	Depth to water	1.00
GdB:							
Goliad	86	Somewhat limited		Very limited		Very limited	
		Seepage	0.03	Seepage	1.00	Depth to water	1.00
				Thin layer	0.70		

Table 24.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GoB:							
Goliad	95	Somewhat limited		Somewhat limited		Very limited	
		Depth to cemented pan	0.61	Thin layer	0.61	Depth to water	1.00
		Seepage	0.03				
GrA:							
Greta	85	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Depth to water	1.00
				Piping	1.00		
ImA:							
Imogene	95	Not limited		Very limited		Very limited	
				Piping	1.00	Depth to water	1.00
InA:							
Inari	85	Not limited		Not limited		Very limited	
						Depth to water	1.00
InB:							
Inari	85	Not limited		Not limited		Very limited	
						Depth to water	1.00
KyB:							
Kuy	95	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
LaA:							
Laewest	95	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Depth to water	1.00
LaB:							
Laewest	95	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Depth to water	1.00
LaD:							
Laewest, eroded	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.68	Hard to pack	0.95	Depth to water	1.00
LmB:							
Leming	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Depth to water	1.00
				Piping	1.00		
MbB:							
Milby	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
				Depth to saturated zone	0.99		
MeA:							
Meguin	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.79	Depth to water	1.00
MgA:							
Meguin	95	Somewhat limited		Somewhat limited		Very limited	

Table 24.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Seepage	0.70	Piping	0.82	Depth to water	1.00
MoA:							
Monteola------------	95	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Depth to water	1.00
MoB:							
Monteola------------	85	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Depth to water	1.00
MoC:							
Monteola------------	85	Somewhat limited		Very limited		Very limited	
		Slope	0.08	Hard to pack	1.00	Depth to water	1.00
NuC:							
Nusil---------------	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.29	Depth to water	1.00
OdA:							
Odem----------------	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
Riverwash-----------	45	Very limited		Not rated		Somewhat limited	
		Seepage	1.00			Depth to saturated zone	0.38
		Not rated	1.00			Cutbanks cave	0.10
OmD:							
Olmedo--------------	90	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Slope	0.32	Thin layer	1.00		
				Piping	0.02		
OrA:							
Orelia--------------	90	Not limited		Very limited		Very limited	
				Piping	1.00	Depth to water	1.00
PaB:							
Papalote------------	90	Not limited		Somewhat limited		Very limited	
				Piping	0.99	Depth to water	1.00
PbA:							
Papalote------------	95	Not limited		Not limited		Very limited	
						Depth to water	1.00
PbB:							
Papalote------------	90	Not limited		Not limited		Very limited	
						Depth to water	1.00
PITS:							
Pits, borrow--------	100	Not rated		Not rated		Not rated	
PrB:							
Parrita-------------	85	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
				Piping	0.02		

Table 24.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
PtC:							
Pernitas------------	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.23	Depth to water	1.00
		Slope	0.08				
PuC:							
Pettus--------------	85	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	0.08				
RaB:							
Raisin--------------	95	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
RaC:							
Raisin--------------	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Seepage	0.08	Depth to water	1.00
		Slope	0.32				
RaC2:							
Raisin--------------	90	Somewhat limited		Not limited		Very limited	
		Seepage	0.11			Depth to water	1.00
RnB:							
Raisin--------------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.95	Depth to saturated zone	1.00	Depth to water	1.00
RoA:							
Realitos------------	90	Not limited		Very limited		Very limited	
				Ponding	1.00	Depth to water	1.00
				Hard to pack	1.00		
RsC:							
Rhymes--------------	95	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.50	Depth to water	1.00
RuB:							
Runge---------------	95	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
RyA:							
Rydolph-------------	85	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Slow refill	1.00
				Depth to saturated zone	0.09	Depth to saturated zone	0.54
						Cutbanks cave	0.10
ScB:							
Sarco---------------	90	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Depth to water	1.00
				Seepage	1.00		
				Piping	1.00		
SnC:							
Sarnosa-------------	95	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.26	Depth to water	1.00

Table 24.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SnD:							
Sarnosa	95	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	0.92				
StC:							
Schattel	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Piping	0.78	Depth to water	1.00
SwA:							
Sinton	95	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
TeA:							
Telferner	90	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Depth to water	1.00
				Seepage	0.04		
TeB:							
Telferner	95	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Depth to water	1.00
				Piping	0.14		
ToA:							
Tiocano	85	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Ponding	1.00	Cutbanks cave	0.10
				Depth to saturated zone	1.00		
				Hard to pack	0.70		
UsB:							
Ustarents	95	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
		Slope	0.08				
VdA:							
Vidauri	85	Not limited		Very limited		Very limited	
				Ponding	1.00	Depth to water	1.00
				Depth to saturated zone	1.00		
				Piping	0.98		
VwA:							
Vidauri	55	Not limited		Very limited		Very limited	
				Ponding	1.00	Depth to water	1.00
				Depth to saturated zone	1.00		
				Piping	0.22		
Wyick	40	Somewhat limited		Very limited		Very limited	
		Seepage	0.03	Depth to saturated zone	1.00	Depth to water	1.00
				Piping	1.00		
W:							
Water	100	Not rated		Not rated		Not rated	

Table 24.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WcC:							
Weesatche-----------	85	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
WeA:							
Weesatche-----------	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.56	Depth to water	1.00
WeB:							
Weesatche-----------	95	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
WeB2:							
Weesatche, eroded---	95	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.37	Depth to water	1.00
WeC:							
Weesatche-----------	95	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	0.02				
WoA:							
Woodsboro-----------	95	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Depth to water	1.00
				Piping	1.00		
				Salinity	0.72		
WyA:							
Wyick---------------	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.03	Depth to saturated zone	1.00	Depth to water	1.00
				Piping	1.00		
ZaA:							
Zalco---------------	95	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
ZcA:							
Zalco---------------	95	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
ZkA:							
Zunker--------------	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.31	Depth to water	1.00
ZnA:							
Zunker--------------	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00

Table 25.--Engineering Properties

(Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash.)

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	
AnA:												
Ander-----------	0-12	*Fine sandy loam	*SC-SM, SC, SM	*A-4	0	0	100	100	87-98	30-45	21-31	6-10
	12-30	*Sandy clay, Clay	*CH, CL, SC	*A-7-6	0	0	97-100	93-100	81-97	46-60	44-59	25-34
	30-48	*Sandy clay loam, Sandy clay, clay loam	*SC, CL	*A-6, A-7-6	0	0	95-100	87-100	76-95	37-53	34-49	17-27
	48-80	*Sandy clay loam, Loam, clay loam	*CL, SC	*A-6, A-7-6	0	0	92-100	77-100	61-97	40-75	34-46	17-25
AnB:												
Ander-----------	0-12	*Fine sandy loam	*SC-SM, SC, SM	*A-4	0	0	100	100	87-98	30-45	21-31	6-10
	12-17	*Sandy clay, Clay	*CH, CL, SC	*A-7-6	0	0	97-100	93-100	81-97	46-60	44-59	25-34
	17-38	*Sandy clay, Sandy clay loam, clay loam	*SC, CL	*A-6, A-7-6	0	0	95-100	87-100	76-95	37-53	34-49	17-27
	38-80	*Sandy clay loam, Loam, clay loam	*CL, SC	*A-6, A-7-6	0	0	92-100	77-100	61-97	40-75	34-46	17-25
BnB:												
Blanconia-------	0-9	*Loamy fine sand	*SC-SM, SM	*A-2-4, A-4	0	0	100	100	80-91	24-40	0-24	NP-6
	9-15	*Loamy fine sand, Loamy sand	*SC-SM, SM	*A-2-4, A-4	0	0	100	100	80-91	25-40	0-23	NP-6
	15-30	*Sandy clay, Clay	*CH	*A-7-6	0	0	100	100	80-95	50-85	44-55	25-32
	30-50	*Sandy clay loam, Sandy clay	*SC, CL	*A-6, A-7-6	0	0	100	98-100	75-100	34-75	35-46	17-25
	50-80	*Sandy clay loam, Clay loam	*SC, CL	*A-6, A-7-6	0	0	100	95-100	75-100	34-75	31-46	13-25
BsA:												
Buchel----------	0-7	*Clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	53-88	29-45
	7-36	*Clay, Silty clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	52-84	29-46
	36-80	*Clay, Silty clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	52-84	29-46
BuA:												
Buchel----------	0-7	*Clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	53-88	29-45
	7-55	*Clay, Silty clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	52-84	29-46
	55-80	*Clay, Silty clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	52-84	29-46

Table 25.--Engineering 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	
CnA:												
Cieno-----------	0-7	*Loam	*CL	*A-7-6, A-6	0	0	100	92-100	88-98	55-69	33-49	13-21
	7-36	*Clay loam, Sandy clay loam, sandy clay	*CL	*A-7-6, A-6	0	0	100	94-100	82-98	52-70	35-47	16-25
	36-80	*Sandy clay loam, Clay loam	*CL	*A-7-6, A-6	0	0	100	94-100	83-98	42-55	34-46	16-25
CrA:												
Clareville------	0-9	*Sandy clay loam	*CL	*A-7-6, A-6	0	0	100	100	80-90	50-65	37-51	17-25
	9-38	*Clay, Clay loam	*CH, CL	*A-7-6	0	0	100	100	90-100	57-67	47-61	25-32
	38-80	*Sandy clay loam, Clay, clay loam	*CL, CH	*A-7-6	0	0	100	98-100	85-95	50-71	42-59	21-33
CrB:												
Clareville------	0-8	*Sandy clay loam	*CL	*A-7-6, A-6	0	0	100	100	80-90	50-65	37-51	17-25
	8-31	*Clay, Clay loam	*CH, CL	*A-7-6	0	0	100	100	90-100	57-67	47-61	25-32
	31-80	*Sandy clay loam, Clay, clay loam	*CL, CH	*A-7-6	0	0	100	98-100	85-95	50-71	42-59	21-33
CsC:												
Colibro---------	0-6	*Sandy clay loam	*SC	*A-6	0	0-5	100	100	80-95	35-45	30-41	13-21
	6-48	*Sandy clay loam, Loam	*SC, CL	*A-6	0	0-4	100	97-100	80-96	36-65	29-41	12-21
	48-60	*Loam, Fine sandy loam	*CL	*A-6, A-4	0	0-4	100	95-100	80-95	40-70	26-41	9-21
CsD:												
Colibro---------	0-9	*Loam	*CL	*A-6	0	0	100	100	80-95	55-65	29-37	12-17
	9-30	*Loam, Sandy clay loam	*CL	*A-6	0	0	100	97-98	80-98	55-65	29-41	12-21
	30-80	*Loam, Fine sandy loam	*CL	*A-6, A-4	0	0	100	95-97	80-95	55-70	26-41	9-21
CyB:												
Coy-------------	0-6	*Clay loam	*CL, CH	*A-7-6, A-6	0	0	98-100	95-100	79-100	61-83	37-55	17-28
	6-14	*Clay, Clay loam	*CH, CL	*A-7-6	0	0	98-100	95-98	75-98	64-91	47-70	25-44
	14-50	*Clay, Clay loam	*CH	*A-7-6	0	0	95-98	84-97	71-96	60-84	46-65	25-40
	50-80	*Clay, Silty clay	*CH	*A-7-6	0	0	92-98	80-97	67-96	58-84	50-65	29-40
CyC:												
Coy-------------	0-10	*Clay loam	*CL, CH	*A-7-6, A-6	0	0	98-100	95-100	79-100	61-83	39-55	19-28
	10-20	*Clay, Clay loam	*CH, CL	*A-7-6	0	0	98-100	95-98	75-98	64-91	47-70	25-44
	20-46	*Clay, Clay loam	*CH	*A-7-6	0	0	95-98	84-97	71-96	60-84	46-65	25-40
	46-80	*Clay, Silty clay	*CH	*A-7-6	0	0	92-98	80-97	67-96	58-84	50-65	29-40

Table 25.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
DaA:												
Dacosta---------	0-8	*Sandy clay loam	*CL, SC	*A-7-6, A-6	0	0	100	100	90-100	41-58	32-45	13-21
	8-38	*Clay loam, Clay, sandy clay loam	*CH	*A-7-6	0	0	100	100	90-100	60-85	42-57	21-33
	38-77	*Sandy clay loam, Sandy clay, clay loam	*CH, CL, SC	*A-7-6	0	0	100	99-100	80-100	46-75	34-56	15-33
	77-80	*Clay loam, Clay, sandy clay loam	*CH, CL	*A-7-6	0	0	100	99-100	80-100	50-85	41-56	21-33
DAMS:												
Dams------------	---	---	---	---	---	---	---	---	---	---	---	---
DcA:												
Dacosta---------	0-10	*Sandy clay loam	*CL, SC	*A-7-6, A-6	0	0	100	100	90-100	41-58	32-45	13-21
	10-43	*Clay loam, Clay, sandy clay loam	*CH	*A-7-6	0	0	100	100	90-100	60-85	42-57	21-33
	43-74	*Sandy clay, Clay loam, clay	*CH, CL	*A-7-6	0	0	100	99-100	80-100	50-85	46-56	25-33
	74-80	*Sandy clay loam, Sandy clay, clay loam	*CH, CL, SC	*A-7-6	0	0	100	99-100	80-100	46-75	36-56	17-33
Contee----------	0-8	*Clay loam	*CH, CL	*A-7-6	0	0	95-100	87-100	76-100	60-84	47-66	25-36
	8-49	*Clay, Silty clay	*CH	*A-7-6	0	0	91-100	77-98	63-98	54-89	50-62	29-36
	49-80	*Clay, Silty clay	*CH, CL	*A-7-6	0	0	91-98	77-92	61-92	51-83	46-61	25-37
DeC:												
Devine----------	0-10	*Very gravelly fine sandy loam	*GC, GC-GM	*A-2-4, A-1	0	0-5	54-65	27-65	24-64	10-32	21-35	6-13
	10-47	*Very gravelly clay, Very gravelly sandy clay, very gravelly clay loam	*GC	*A-7-6	0	5-10	51-61	26-61	20-56	15-46	43-60	24-36
	47-53	*Very gravelly sandy clay, Very gravelly clay, very gravelly clay loam	*GC	*A-2-7	0	3-10	55-61	32-61	21-50	16-40	43-60	24-36
	53-80	*Loam, Sandy clay loam	*ML	*A-4	0	0	90-100	80-98	60-80	43-65	20-34	6-17
DUMPS:												
Dumps, dumps----	---	---	---	---	---	---	---	---	---	---	---	---

Table 25.--Engineering 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	
EbA:												
Edna------------	0-9	*Fine sandy loam	*CL, CL-ML	*A-6, A-4	0	0	100	100	80-85	40-55	23-37	7-13
	9-30	*Clay, Clay loam	*CH	*A-7-6	0	0	100	100	90-100	70-90	46-64	25-36
	30-50	*Clay loam, Clay	*CL, CH	*A-7-6	0	0	100	100	90-100	70-90	46-57	25-33
	50-80	*Sandy clay loam, Clay loam, clay	*CL, CH	*A-7-6	0	0	98-100	97-100	85-95	50-90	42-53	21-29
EdA:												
Edroy-----------	0-7	*Clay	*CH	*A-7-6	0	0	100	100	100	75-90	51-63	29-32
	7-57	*Clay	*CH, CL	*A-7-6	0	0	100	100	100	75-90	51-64	29-36
	57-70	*Clay	*CH, CL	*A-7-6	0	0	100	100	98-100	75-90	47-63	25-36
	70-80	*Sandy clay loam, Fine sandy loam	*SC, SC-SM, SM	*A-6, A-2-6	0	0	100	100	80-90	35-45	28-45	12-25
EnB:												
Elmendorf-------	0-6	*Sandy clay loam	*CL	*A-6, A-7-6	0	0-1	95-100	86-100	76-100	51-73	33-53	13-24
	6-26	*Clay, Clay loam	*CH, CL	*A-7-6	0	0-1	95-100	86-100	61-100	47-84	47-66	25-36
	26-55	*Clay loam, Clay	*CL, CH	*A-7-6	0	0-1	95-100	86-100	71-98	55-80	46-57	25-33
	55-80	*Clay loam, Clay	*CH	*A-7-6	0	0-1	95-100	86-100	71-98	55-80	46-57	25-33
Denhawken-------	0-6	*Clay loam	*CL, CH	*A-7-6	0	0-1	95-100	85-100	74-100	52-76	41-62	21-32
	6-41	*Clay loam, Clay	*CL, CH	*A-7-6	0	0-1	95-100	85-100	60-91	45-73	47-64	25-36
	41-80	*Clay loam, Clay	*CH, CL	*A-7-6	0	0-1	96-100	87-100	87-100	73-100	45-60	25-37
FdA:												
Faddin----------	0-16	*Fine sandy loam	*CL-ML, ML	*A-4	0	0	100	100	86-100	41-51	19-33	3-10
	16-46	*Clay, Clay loam, sandy clay	*CH, CL	*A-7-6	0	0	99-100	98-100	85-100	67-90	46-70	25-42
	46-80	*Clay loam, Sandy clay loam, sandy clay	*CL	*A-7-6	0	0	100	98-100	85-100	61-82	39-50	21-29
GdB:												
Goliad----------	0-10	*Fine sandy loam	*SC, SC-SM	*A-2-4, A-4	0	0	100	100	86-96	27-37	22-37	6-13
	10-25	*Sandy clay, Sandy clay loam, clay loam	*SC, CL	*A-7-6, A-6	0	0	95-100	86-100	63-84	35-51	40-51	21-29
	25-35	*Cemented material			---	---	---	---	---	---	---	---
	35-80	*Cemented material			---	---	---	---	---	---	---	---

Table 25.--Engineering 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	
GoB:												
Goliad----------	0-13	*Sandy clay loam	*SC, CL	*A-6	0	0	100	100	86-98	40-54	33-49	13-23
	13-17	*Sandy clay loam, Sandy clay, clay loam	*SC, CL	*A-6, A-7-6	0	0	95-100	86-100	71-95	40-55	38-51	19-29
	17-37	*Sandy clay, Clay, clay loam	*CL, CH	*A-7-6	0	0	95-100	82-100	64-91	46-70	45-59	26-36
	37-49	*Cemented material			---	---	---	---	---	---	---	---
	49-80	*Cemented material			---	---	---	---	---	---	---	---
GrA:												
Greta-----------	0-5	*Fine sandy loam	*SC-SM, SM	*A-4	0	0	100	100	90-100	40-47	21-33	4-12
	5-13	*Sandy clay loam, Clay loam, sandy clay	*CL, SC	*A-6, A-7-6	0	0	100	95-100	80-100	36-80	36-54	17-29
	13-34	*Sandy clay loam, Clay loam	*SC, CL	*A-6	0	0	96-100	92-100	80-100	36-80	32-46	15-25
	34-80	*Sandy clay loam, Clay loam	*CL, SC	*A-6	0	0	95-100	91-100	84-100	35-80	35-49	14-24
ImA:												
Imogene---------	0-6	*Fine sandy loam	*SC-SM, SC	*A-4, A-6	0	0	100	100	90-100	40-50	20-32	4-12
	6-25	*Sandy clay loam, Clay loam	*SC, CL	*A-7-6, A-6	0	0	100	100	73-88	38-53	32-47	13-25
	25-65	*Sandy clay loam, Clay loam	*SC, CL	*A-7-6, A-6	0	0	100	98-100	69-85	34-50	32-47	13-25
	65-80	*Loam, Sandy clay loam, clay loam	*CL	*A-7-6, A-6	0	0	95-100	87-100	84-100	53-74	31-45	13-24
InA:												
Inari-----------	0-11	*Fine sandy loam	*SC-SM, SM	*A-2-4	0	0	100	100	93-98	30-41	18-32	2-10
	11-18	*Sandy clay, Sandy clay loam, clay	*CL,	*A-7-6	0	0	100	100	85-99	51-60	41-58	21-33
	18-36	*Sandy clay loam, Clay loam	*CL, SC	*A-7-6, A-6	0	0	100	98-100	80-99	45-55	35-46	17-25
	36-80	*Sandy clay loam, Clay loam	*CL, SC	*A-7-6, A-6	0	0	100	98-100	80-99	45-55	35-41	17-21
InB:												
Inari-----------	0-13	*Fine sandy loam	*SC-SM, SM	*A-2-4	0	0	100	100	93-98	30-41	18-32	2-10
	13-40	*Sandy clay loam, Clay loam	*CL	*A-7-6, A-6	0	0	100	100	85-99	51-60	37-48	18-25
	40-80	*Sandy clay loam, Clay loam	*CL, SC	*A-7-6, A-6	0	0	100	98-100	80-99	45-55	0-41	NP-21

Table 25.--Engineering 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	
KyB:												
Kuy-------------	0-12	*Fine sand	*SM	*A-2-4	0	0	100	100	82-97	14-27	0-26	NP-7
	12-66	*Fine sand	*SM	*A-2-4	0	0	100	100	85-96	14-25	0-24	NP-7
	66-80	*Sandy clay loam, Clay loam	*SC	*A-6	0	0	100	100	78-100	30-48	29-44	13-25
LaA:												
Laewest---------	0-6	*Clay	*CH	*A-7-6	0	0	100	100	95-100	75-95	55-83	29-42
	6-40	*Clay	*CH	*A-7-6	0	0	100	100	95-100	75-95	53-79	29-42
	40-62	*Clay	*CH	*A-7-6	0	0	100	98-100	95-100	75-90	52-77	29-44
	62-80	*Clay loam	*CH	*A-7-6	0	0-1	95-100	86-100	71-98	55-80	46-52	25-28
LaB:												
Laewest---------	0-6	*Clay	*CH	*A-7-6	0	0	100	100	95-100	75-95	55-83	29-42
	6-46	*Clay	*CH	*A-7-6	0	0	100	100	95-100	75-95	53-79	29-42
	46-80	*Clay	*CH	*A-7-6	0	0	100	98-100	95-100	75-90	52-77	29-44
LaD:												
Laewest, eroded-	0-10	*Clay	*CH	*A-7-6	0	0	100	98-100	81-100	69-91	55-89	29-45
	10-24	*Clay	*CH	*A-7-6	0	0	100	98-100	81-100	69-91	53-82	29-46
	24-60	*Clay	*CH	*A-7-6	0	0	98-100	96-100	81-100	69-91	52-82	29-46
	60-80	*Clay	*CH	*A-7-6	0	0	96-100	93-100	75-100	64-92	52-80	29-46
LmB:												
Leming----------	0-8	*Loamy fine sand	*SM, SC-SM	*A-2-4	0	0	100	100	83-100	15-29	16-28	1-10
	8-28	*Loamy fine sand, Fine sand	*SM, SC-SM	*A-2-4	0	0	100	100	82-100	15-29	0-28	NP-10
	28-48	*Sandy clay, Clay	*CH, CL	*A-7-6	0	0-10	100	100	85-100	55-85	44-55	25-32
	48-80	*Sandy clay loam, Clay loam	*CL, SC	*A-7-6, A-6	0	0-9	100	100	80-100	40-75	35-46	17-25
MbB:												
Milby-----------	0-11	*Fine sand	*SM, SC-SM	*A-2-4	0	0	100	100	86-95	15-26	0-25	NP-6
	11-28	*Sand, Fine sand	*SM, SC-SM	*A-2-4	0	0	100	100	81-95	15-24	0-21	NP-4
	28-80	*Sandy clay loam, Clay loam	*SC	*A-6, A-7-6	0	0	100	98-100	75-90	35-45	31-42	13-21

Table 25.--Engineering 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	
MeA:												
Meguin----------	0-18	*Silty clay loam	*CL	*A-7-6	0	0	100	100	95-100	85-95	37-56	18-26
	18-41	*Clay loam, Silty clay loam, loam	*CL	*A-6	0	0	100	100	95-100	85-90	30-46	13-24
	41-61	*Clay loam, Loam, sandy clay loam	*CL	*A-6	0	0	100	100	95-100	80-90	35-46	17-24
	61-80	*Clay, Silty clay loam, clay loam	*CH, CL	*A-7-6	0	0	100	100	95-100	85-95	40-65	21-40
MgA:												
Meguin----------	0-11	*Silty clay loam	*CL	*A-7-6	0	0	100	100	95-100	85-95	37-56	18-26
	11-46	*Loam, Silty clay loam, clay loam	*CL	*A-6	0	0	100	100	95-100	85-90	30-46	13-24
	46-58	*Clay loam, Loam, sandy clay loam	*CL	*A-6	0	0	100	100	95-100	80-90	29-46	12-24
	58-80	*Clay loam, Silty clay loam, clay	*CH, CL	*A-7-6	0	0	95-100	85-100	84-100	71-100	40-65	20-40
MoA:												
Monteola--------	0-8	*Clay	*CH	*A-7-6	0	0-3	100	100	90-100	75-87	53-81	29-42
	8-30	*Clay	*CH	*A-7-6	0	0-3	100	100	90-100	75-91	52-84	29-46
	30-62	*Clay	*CH	*A-7-6	0	0-3	100	97-99	90-95	75-91	52-80	29-46
	62-80	*Clay	*CH	*A-7-6	0	0-3	100	95-99	90-95	75-91	50-70	29-44
MoB:												
Monteola--------	0-12	*Clay	*CH	*A-7-6	0	0-3	100	100	90-100	75-87	53-81	29-42
	12-26	*Clay	*CH	*A-7-6	0	0-3	100	100	90-100	75-91	52-84	29-46
	26-50	*Clay	*CH	*A-7-6	0	0-3	100	97-99	90-95	75-91	52-80	29-46
	50-80	*Clay	*CH	*A-7-6	0	0-3	100	95-99	90-95	75-91	50-70	29-44
MoC:												
Monteola--------	0-8	*Clay	*CH	*A-7-6	0	0-3	100	100	90-100	75-87	53-81	29-42
	8-23	*Clay	*CH	*A-7-6	0	0-3	100	100	90-100	75-91	52-84	29-46
	23-54	*Clay	*CH	*A-7-6	0	0-3	100	97-99	90-95	75-91	52-80	29-46
	54-80	*Clay	*CH	*A-7-6	0	0-3	100	95-99	90-95	75-91	50-70	29-44
NuC:												
Nusil-----------	0-5	*Fine sand	*SM	*A-2-4	0	0	100	100	85-94	12-24	0-24	NP-6
	5-23	*Fine sand, Loamy fine sand	*SM	*A-2-4	0	0	100	100	84-96	12-24	0-27	NP-8
	23-53	*Sandy clay loam	*SC	*A-6, A-2-6	0	0	100	100	68-90	31-48	29-47	12-25
	53-80	*Fine sandy loam, Sandy clay loam	*SC	*A-2-6, A-6	0	0	100	100	61-90	24-45	26-47	9-25

Table 25.--Engineering 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	
OdA:												
Odem------------	0-28	*Fine sandy loam	*CL, CL-ML	*A-4	0	0	100	100	90-100	50-70	20-35	3-12
	28-59	*Fine sandy loam, Loamy fine sand	*CL, CL-ML	*A-4	0	0	100	100	90-100	50-70	20-35	3-12
	59-80	*Fine sandy loam, Loamy fine sand, loam	*SM, SC-SM	*A-4	0	0	100	100	90-100	14-55	19-33	3-12
Riverwash-------	0-80	*Fine sandy loam, Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0-1	0-5	95-100	89-100	79-100	26-45	16-32	2-13
OmD:												
Olmedo----------	0-6	*Very gravelly loam	*GC-GM, GC	*A-2-6	0-11	0-29	30-50	25-40	20-35	10-15	26-37	11-18
	6-14	*Very gravelly loam	*GC-GM, GC	*A-2-6	0-10	0-30	25-50	20-40	15-35	10-15	26-37	11-18
	14-23	*Cemented material		---	---	---	---	---	---	---	---	---
	23-80	*Silt loam	*ML	*A-4, A-6	0	0	90-100	80-98	60-80	43-65	20-24	6-11
OrA:												
Orelia----------	0-5	*Fine sandy loam	*SC-SM, SC, SM	*A-2-4, A-4	0	0	100	100	85-95	25-39	19-31	3-10
	5-39	*Sandy clay loam, Clay loam	*CL, SC	*A-7-6, A-6	0	0	100	100	85-95	49-56	38-47	19-25
	39-80	*Sandy clay loam, Clay loam	*SC, CL	*A-6, A-7-6	0	0	100	100	80-95	36-54	31-46	13-25
PaB:												
Papalote--------	0-9	*Loamy sand	*SM, SC-SM	*A-2-4	0	0	100	100	85-95	24-32	0-24	NP-6
	9-28	*Sandy clay, Clay	*CL, CH, SC	*A-7-6	0	0	100	100	85-95	45-80	44-55	25-32
	28-36	*Sandy clay loam, Sandy clay	*SC	*A-6, A-7-6	0	0	100	100	80-90	35-45	33-49	15-27
	36-80	*Loam, Sandy clay loam	*CL	*A-6	0	0	99-100	95-100	80-90	53-65	32-42	15-21
PbA:												
Papalote--------	0-8	*Fine sandy loam	*SM, SC, SC-SM	*A-2-4, A-4	0	0	100	95-100	88-99	25-45	18-30	3-11
	8-24	*Sandy clay, Clay	*CL, CH	*A-7-6	0	0	100	95-100	85-95	50-60	44-55	25-32
	24-52	*Sandy clay loam, Clay loam, sandy clay	*CL, SC	*A-7-6, A-6	0	0	99-100	90-100	80-90	48-55	39-46	21-25
	52-80	*Sandy clay loam	*SC	*A-6, A-7-6	0	0	98-100	90-100	80-90	35-48	32-46	15-25

Table 25.--Engineering 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	
PbB:												
Papalote--------	0-8	*Fine sandy loam	*SC, SC-SM, SM	*A-2-4, A-4	0	0	100	100	70-85	20-45	18-30	3-11
	8-27	*Sandy clay, Clay	*CL, CH, SC	*A-7-6	0	0	100	100	85-95	45-80	44-55	25-32
	27-34	*Sandy clay loam	*SC	*A-6, A-7-6	0	0	99-100	88-100	80-90	35-45	33-47	15-25
	34-80	*Sandy clay loam	*SC	*A-6	0	0	99-100	83-100	80-90	31-45	32-42	15-21
PITS:												
Pits, borrow----	---	---	---	---	---	---	---	---	---	---	---	---
PrB:												
Parrita---------	0-6	*Sandy clay loam	*SC	*A-6, A-2-6	0	0	100	100	84-98	35-49	27-45	10-21
	6-18	*Sandy clay loam, Sandy clay	*SC	*A-7-6, A-6	0	0	95-100	90-100	65-72	35-49	37-49	17-25
	18-33	*Cemented material		---	---	---	---	---	---	---	---	---
	33-80	*Loam	*ML	*A-4	0	0	90-100	80-98	60-80	43-65	20-30	6-13
PtC:												
Pernitas--------	0-11	*Sandy clay loam	*SC, CL	*A-6	0	0	100	98-100	90-100	44-57	31-47	13-22
	11-29	*Clay loam, Sandy clay loam	*CL	*A-7-6, A-6	0	0	95-100	90-100	72-95	46-65	32-49	14-25
	29-80	*Clay loam, Sandy clay loam	*CL	*A-7-6, A-6	0	0	96-100	86-100	72-98	45-67	32-47	14-25
PuC:												
Pettus----------	0-11	*Loam	*CL, SC	*A-6, A-7-6	0	0	85-100	66-100	56-100	42-78	31-49	13-24
	11-25	*Very gravelly loam, Gravelly loam, gravelly sandy clay loam	*GC, CL, SC	*A-6, A-2-6, A-7-6	0	0-9	60-87	22-87	19-87	14-68	31-49	13-24
	25-35	*Very gravelly loam, Very gravelly sandy clay loam	*GC, CL, SC	*A-6, A-2-6	0-5	0-17	55-85	16-85	14-79	10-59	27-38	12-18
	35-80	*Very gravelly loam, Very gravelly sandy clay loam	*GC, CL, SC	*A-6, A-2-6	0	0-9	65-95	24-95	20-90	14-67	25-38	9-18

Table 25.--Engineering 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	
RaB:												
Raisin----------	0-5	*Loamy fine sand	*SM, SC-SM	*A-2-4	0	0	100	100	91-100	15-29	0-26	NP-7
	5-19	*Loamy fine sand, Loamy sand	*SM, SC-SM	*A-2-4	0	0	100	100	91-100	15-29	0-25	NP-7
	19-25	*Sandy clay loam, Sandy clay	*SC, CL	*A-6, A-7-6	0	0	100	94-100	80-95	38-51	39-49	21-27
	25-67	*Sandy clay loam	*SC	*A-6, A-7-6	0	0	100	95-100	90-95	42-49	32-42	15-21
	67-80	*Loam, Sandy clay loam, fine sandy loam	*SC	*A-6	0	0	60-85	50-85	48-75	35-49	29-40	12-20
RaC:												
Raisin----------	0-9	*Loamy fine sand	*SM, SC-SM	*A-2-4	0	0	100	100	85-94	15-32	0-26	NP-7
	9-19	*Sandy clay loam, Sandy clay	*SC	*A-6, A-7-6	0	0	100	94-100	74-95	32-49	39-46	21-25
	19-38	*Sandy clay loam	*SC	*A-6, A-7-6	0	0	100	95-100	85-95	37-49	32-46	15-25
	38-80	*Fine sandy loam, Loam, sandy clay loam	*SC	*A-6	0	0	60-85	50-85	48-75	35-49	29-40	11-20
RaC2:												
Raisin----------	0-4	*Loamy fine sand	*SC-SM,	*A-2-4	0	0	100	95-100	95-100	25-44	21-33	4-12
	4-18	*Sandy clay loam, Sandy clay	*CL, SC	*A-7-6, A-6	0	0	100	98-100	85-100	42-55	39-49	20-25
	18-80	*Sandy clay loam, Loam	*SC, CL	*A-7-6, A-6	0	0	100	96-100	85-100	35-50	31-47	13-24
RnB:												
Raisin----------	0-11	*Fine sandy loam	*SC-SM, SC	*A-2-4	0	0	100	95-100	95-100	25-44	21-33	4-12
	11-20	*Sandy clay loam, Sandy clay	*CL, SC	*A-7-6, A-6	0	0	100	94-100	85-100	42-55	39-49	20-25
	20-35	*Sandy clay loam	*SC	*A-6, A-7-6	0	0	100	95-100	85-100	38-48	32-45	15-22
	35-80	*Sandy clay loam, Loam	*SC	*A-6, A-7-6	0	0	100	96-100	85-100	35-44	31-45	13-22
RoA:												
Realitos--------	0-6	*Clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	56-76	33-49
	6-23	*Clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	53-86	29-45
	23-75	*Clay	*CH	*A-7-6	0	0	100	100	90-100	75-95	56-76	33-49
	75-80	*Sandy clay loam, Sandy clay, clay loam	*SC, CH	*A-7-6	0	0	100	100	80-95	40-80	44-63	22-30
RsC:												
Rhymes----------	0-10	*Fine sand	*SM	*A-2-4	0	0	100	100	50-80	15-35	16-20	NP-3
	10-64	*Fine sand, Loamy sand, loamy fine sand	*SM	*A-2-4	0	0	100	100	50-80	15-35	16-20	NP-3
	64-80	*Sandy clay loam, Fine sandy loam	*SC, CL	*A-6, A-4	0	0	100	100	80-90	35-55	25-38	8-15

Table 25.--Engineering 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	
RuB:												
Runge-----------	0-14	*Fine sandy loam	*SC-SM, SC	*A-4	0	0	100	100	70-88	40-55	22-39	6-13
	14-51	*Sandy clay loam, Clay loam	*SC	*A-7-6, A-6	0	0	100	98-100	80-95	34-51	32-49	13-25
	51-80	*Sandy clay loam, Fine sandy loam, loam	*SC, CL	*A-7-6, A-6	0	0	100	95-100	80-89	35-65	29-45	12-23
RyA:												
Rydolph---------	0-9	*Silty clay	*CH	*A-7-6	0	0	100	98-100	90-100	80-98	51-65	33-44
	9-80	*Silty clay loam, Silt loam, loam	*CH, CL	*A-7-6, A-6	0	0	98-100	95-100	90-100	75-95	38-62	22-40
ScB:												
Sarco-----------	0-5	*Coarse sand	*SM, SC-SM	*A-3	0	0	99-100	98-100	55-67	7-16	0-25	NP-6
	5-12	*Coarse sand, Sand	*SM, SC-SM	*A-2-4	0	0	99-100	98-100	60-72	12-22	0-24	NP-6
	12-20	*Sandy clay loam, Sandy clay	*SC	*A-7-6	0	0	99-100	98-100	61-79	28-44	40-55	21-32
	20-32	*Sandy clay loam, Sandy loam	*SC	*A-6	0	0	99-100	98-100	68-81	29-41	26-42	10-21
	32-80	*Sandy clay loam, Sandy loam	*SC	*A-6	0	0	99-100	90-100	66-81	32-42	26-42	10-21
SnC:												
Sarnosa---------	0-11	*Fine sandy loam	*SC-SM, SC, SM	*A-2-4, A-2-6	0	0	97-100	93-100	93-100	25-40	21-37	4-13
	11-37	*Fine sandy loam, Loam, sandy clay loam	*SC, SC-SM	*A-2-4, A-2-6	0	0	95-100	90-100	69-91	25-43	20-36	4-15
	37-80	*Fine sandy loam, Loam, sandy clay loam	*SC-SM, SC	*A-2-4, A-4	0	0	95-100	72-97	56-91	21-44	19-37	4-17
SnD:												
Sarnosa---------	0-7	*Fine sandy loam	*SC-SM, SC, SM	*A-4, A-6	0	0	100	95-100	76-90	40-45	21-35	4-12
	7-29	*Fine sandy loam, Loam	*SC, SC-SM	*A-4, A-6	0	0	100	95-100	77-90	40-46	20-33	4-12
	29-80	*Sandy clay loam, Fine sandy loam, loam	*SC, SC-SM, CL	*A-6, A-4	0	0	100	95-100	70-90	33-54	19-37	4-17
StC:												
Schattel--------	0-13	*Sandy clay loam	*CL	*A-7-6, A-6	0	0	100	100	85-100	55-73	38-49	19-25
	13-39	*Clay, Clay loam	*CH, CL	*A-7-6	0	0	100	98-100	83-100	67-88	46-66	25-40
	39-52	*Clay, Clay loam	*CH, CL	*A-7-6	0	0	98-100	95-98	76-98	64-91	45-65	25-40
	52-80	*Clay, Silty clay, clay loam	*CH, CL	*A-7-6	0	0	97-100	91-98	73-98	61-91	45-69	25-44

Table 25.--Engineering 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	
SwA:												
Sinton----------	0-17	*Sandy clay loam	*SC	*A-6	0	0	100	98-100	91-98	35-45	31-49	13-24
	17-41	*Sandy clay loam, Loam, clay loam	*SC, CL	*A-6, A-4	0	0	100	98-100	87-98	35-65	31-49	13-24
	41-80	*Sandy clay loam, Fine sandy loam, loam, clay loam	*CL, SC	*A-6, A-4	0	0	100	98-100	70-98	40-65	23-47	7-24
TeA:												
Telferner-------	0-9	*Fine sandy loam	*SC-SM, SC	*A-2-4	0	0	100	95-100	90-94	20-35	20-31	4-12
	9-29	*Sandy clay, Clay	*SC, CL, CH	*A-7-6	0	0	100	95-100	90-97	45-58	46-61	25-37
	29-80	*Sandy clay loam, Sandy clay, clay loam	*SC, CH, CL	*A-7-6, A-6	0	0	100	95-100	90-97	31-52	31-50	13-29
TeB:												
Telferner-------	0-12	*Fine sandy loam	CL, CL-ML, SC-SM	*A-4	0	0	90-100	90-100	80-100	40-60	20-30	5-10
	12-40	*Sandy clay, Clay	*CH	*A-7-6	0	0	90-100	90-100	90-100	55-85	51-65	30-40
	40-80	*Sandy clay loam, Clay loam, sandy clay	*CL	*A-6, A-7-6	0	0	90-100	90-100	85-100	50-75	30-50	15-32
ToA:												
Tiocano---------	0-9	*Clay	*CH	*A-7-6	0	0	100	100	82-100	71-91	53-86	29-45
	9-34	*Clay	*CH	*A-7-6	0	0	100	100	82-100	71-91	52-82	29-46
	34-67	*Sandy clay, Sandy clay loam, clay loam	*SC, CH	*A-7-6, A-6	0	0	100	100	80-95	40-80	44-63	22-30
	67-80	*Fine sandy loam	*SC-SM, SM	*A-4	0	0	100	95-100	83-99	35-49	27-35	9-13
UsB:												
Ustarents-------	0-6	*Sandy clay loam	*CL, SC	*A-6, A-7-6	0	0	99-100	98-100	85-99	40-75	35-48	15-25
	6-60	*Sandy clay loam, Clay loam	*CL, SC	*A-6, A-7-6	0	0	99-100	98-100	85-99	40-75	35-48	15-25
VdA:												
Vidauri---------	0-4	*Fine sandy loam	*SC, SC-SM	*A-6, A-4	0	0	100	100	95-98	36-48	20-37	4-13
	4-41	*Clay loam, Sandy clay loam, sandy clay	*CH	*A-7-6, A-6	0	0	100	100	95-100	75-85	34-47	17-25
	41-49	*Sandy clay loam, Clay loam	*CL, CH	*A-7-6, A-6	0	0	98-100	97-100	90-99	37-55	34-46	17-25
	49-80	*Sandy clay loam, Sandy clay, clay loam	*CL, CH	*A-7-6, A-6	0	0	98-100	97-100	90-99	37-55	30-46	13-25

Table 25.--Engineering 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	
VwA:												
Vidauri---------	0-4	*Fine sandy loam	*SC, SC-SM	*A-4, A-6	0	0	100	100	95-98	36-48	23-37	7-13
	4-34	*Clay loam, Sandy clay loam	*CH	*A-7-6, A-6	0	0	100	100	95-100	75-85	34-47	17-25
	34-80	*Sandy clay loam, Clay loam	*CL, CH	*A-7-6, A-6	0	0	98-100	97-100	90-99	37-55	34-44	17-23
Wyick-----------	0-9	*Fine sandy loam	*SC, SC-SM	*A-4, A-2-4	0	0	100	100	95-100	30-49	18-27	2-7
	9-15	*Sandy clay, Sandy clay loam	*CH,	*A-7-6, A-6	0	0	100	100	85-100	50-66	36-58	17-33
	15-34	*Sandy clay loam	*CH, CL	*A-7-6, A-6	0	0	100	100	82-100	50-60	31-46	13-25
	34-80	*Sandy clay loam	*CL, CH	*A-6, A-7-6	0	0	100	95-100	66-98	51-71	32-46	15-25
W:												
Water-----------	---	---	---	---	---	---	---	---	---	---	---	---
WcC:												
Weesatche-------	0-10	*Fine sandy loam	*SC-SM, SC	*A-4, A-2-4	0	0	100	100	70-93	35-41	22-39	6-13
	10-50	*Sandy clay loam, Clay loam	*SC	*A-7-6, A-6	0	0	100	98-100	80-95	32-49	32-49	13-25
	50-80	*Sandy clay loam, Loam	*SC, CL	*A-7-6, A-6	0	0	100	95-100	80-85	27-65	28-45	10-23
WeA:												
Weesatche-------	0-9	*Sandy clay loam	*SC	*A-6, A-2-6	0	0	100	100	77-84	25-38	33-47	13-19
	9-27	*Sandy clay loam, Clay loam	*SC, CL	*A-6, A-7-6	0	0	100	100	69-84	36-51	32-49	13-25
	27-80	*Loam, Sandy clay loam	*CL, SC	*A-6, A-7-6	0	0	98-100	95-100	64-84	47-65	28-45	10-23
WeB:												
Weesatche-------	0-5	*Sandy clay loam	*SC, CL	*A-6	0	0	100	100	86-98	44-60	33-51	13-21
	5-28	*Sandy clay loam, Sandy clay, clay loam	*CL	*A-6, A-7-6	0	0	100	100	80-98	50-65	32-54	13-27
	28-80	*Clay loam, Sandy clay loam, loam	*CL	*A-6, A-7-6	0	0	80-95	75-90	69-90	50-70	31-45	13-23
WeB2:												
Weesatche, eroded---------	0-6	*Sandy clay loam	*SC, CL	*A-6	0	0	100	100	92-98	37-60	33-51	13-21
	6-25	*Clay loam, Sandy clay loam	*CL	*A-6, A-7-6	0	0	100	100	81-98	50-65	32-51	13-25
	25-80	*Loam, Sandy clay loam	*CL	*A-6, A-7-6	0	0	80-95	75-90	71-90	50-70	28-45	10-23

Table 25.--Engineering 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	
WeC:												
Weesatche-------	0-7	*Sandy clay loam	*SC, CL	*A-6, A-7-6	0	0	100	100	86-98	44-60	33-51	13-21
	7-33	*Sandy clay loam, Clay loam	*CL	*A-6, A-7-6	0	0	100	100	80-98	50-65	32-51	13-25
	33-80	*Loam, Sandy clay loam	*CL	*A-6, A-7-6	0	0	80-95	75-90	69-90	50-70	28-45	10-23
WoA:												
Woodsboro-------	0-6	*Loam	*SC, SC-SM	*A-4	0	0	100	100	91-100	40-50	21-35	6-13
	6-32	*Clay, Sandy clay	*CH, CL	*A-7-6	0	0	100	100	85-100	51-85	46-57	25-33
	32-38	*Sandy clay loam, Clay loam	*SC, CL	*A-7-6, A-6	0	0	100	99-100	80-98	40-85	41-49	21-25
	38-80	*Sandy clay loam, Clay loam	*SC	*A-6, A-7-6	0	0	100	98-100	80-95	40-80	33-49	14-25
WyA:												
Wyick-----------	0-6	*Fine sandy loam	*SC, SC-SM	*A-4, A-2-4	0	0	100	100	95-100	30-49	18-27	2-7
	6-12	*Sandy clay, Sandy clay loam	*CH	*A-7-6, A-6	0	0	100	100	85-100	50-66	42-58	22-33
	12-30	*Sandy clay loam	*CH, CL	*A-7-6, A-6	0	0	100	100	82-100	50-60	31-46	13-25
	30-80	*Sandy clay loam, Loam	*CL, CH	*A-7-6, A-6	0	0	100	95-100	66-98	51-71	31-46	13-25
ZaA:												
Zalco-----------	0-10	*Sand	*SP-SM	*A-2-4	0	0	95-100	90-100	59-90	2-11	0-22	NP-4
	10-80	*Sand	*SP-SM	*A-2-4	0	0	95-100	90-100	54-90	2-10	0-21	NP-4
ZcA:												
Zalco-----------	0-6	*Sand	*SP-SM	*A-2-4	0	0	95-100	90-100	64-90	1-10	0-22	NP-4
	6-80	*Fine sand	*SP-SM	*A-2-4	0	0	95-100	90-100	75-98	2-10	0-21	NP-4
ZkA:												
Zunker----------	0-12	*Fine sandy loam	*SC-SM, SM	*A-4	0	0	100	95-100	83-99	35-49	21-35	4-13
	12-77	*Loamy fine sand, Loam, fine sandy loam	*SC-SM, SM	*A-2-4	0	0	100	95-100	86-100	20-32	19-31	3-12
	77-80	*Clay loam, Loam	*CL	*A-6, A-4	0	0	100	95-100	95-100	60-80	26-43	9-22
ZnA:												
Zunker----------	0-9	*Fine sandy loam	*SM, SC-SM	*A-4	0	0	100	95-100	70-85	40-49	16-23	NP-7
	9-26	*Loamy fine sand, Fine sandy loam	*SM, SC-SM	*A-4, A-2-4	0	0	100	95-100	70-90	25-49	12-23	NP-7
	26-80	*Fine sandy loam, Loamy fine sand	*ML, SM, CL-ML, SC-SM	*A-4	0	0	100	95-100	85-95	40-75	16-23	NP-7

Table 26.--Physical Soil Properties

(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	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	g/cc	In/hr	In/in	Pct	Pct					
AnA:												
Ander----------------	0-12	10-15	1.45-1.70	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	12-30	35-47	1.35-1.60	0.06-0.2	0.13-0.18	3.0-9.0	0.2-0.8	.20	.20			
	30-48	25-38	1.45-1.70	0.06-0.2	0.12-0.17	2.0-5.9	0.1-0.5	.24	.24			
	48-80	25-35	1.45-1.70	0.06-0.2	0.12-0.17	2.0-5.9	0.1-0.5	.24	.24			
AnB:												
Ander----------------	0-12	10-15	1.45-1.70	2-6	0.11-0.16	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	12-17	35-47	1.35-1.60	0.06-0.2	0.13-0.18	3.0-9.0	0.2-0.8	.20	.20			
	17-38	25-38	1.45-1.70	0.06-0.2	0.12-0.17	2.0-5.9	0.1-0.5	.24	.24			
	38-80	25-35	1.45-1.70	0.06-0.2	0.12-0.17	2.0-5.9	0.1-0.5	.24	.24			
BnB:												
Blanconia------------	0-9	3-10	1.50-1.70	2-6	0.07-0.11	0.0-2.9	0.2-1.0	.32	.32	5	2	134
	9-15	3-10	1.50-1.70	2-6	0.07-0.11	0.0-2.9	0.1-0.5	.43	.43			
	15-30	35-45	1.35-1.60	0.06-0.2	0.13-0.18	3.0-5.9	0.2-0.8	.20	.20			
	30-50	25-35	1.45-1.70	0.06-0.2	0.12-0.17	3.0-5.9	0.1-0.2	.28	.28			
	50-80	20-35	1.45-1.70	0.06-0.2	0.12-0.17	3.0-5.9	0.1-0.2	.32	.32			
BsA:												
Buchel---------------	0-7	40-60	1.25-1.55	0.00-0.06	0.12-0.18	9.0-25.0	1.0-5.0	.32	.32	5	4	86
	7-36	40-60	1.25-1.60	0.00-0.06	0.12-0.18	9.0-25.0	0.5-3.0	.32	.32			
	36-80	40-60	1.30-1.60	0.00-0.06	0.12-0.18	9.0-25.0	0.2-3.0	.32	.32			
BuA:												
Buchel---------------	0-7	40-60	1.25-1.55	0.00-0.06	0.12-0.18	9.0-25.0	1.0-5.0	.32	.32	5	4	86
	7-55	40-60	1.25-1.60	0.00-0.06	0.12-0.18	9.0-25.0	0.5-3.0	.32	.32			
	55-80	40-60	1.30-1.60	0.00-0.06	0.12-0.18	9.0-25.0	0.2-3.0	.32	.32			
CnA:												
Cieno----------------	0-7	20-30	1.20-1.45	0.2-0.6	0.12-0.18	3.0-5.9	1.0-4.0	.32	.32	5	6	48
	7-36	24-35	1.40-1.75	0.00-0.06	0.12-0.18	3.0-5.9	0.4-1.0	.32	.32			
	36-80	24-35	1.40-1.80	0.00-0.06	0.12-0.18	3.0-5.9	0.0-0.5	.32	.32			
CrA:												
Clareville-----------	0-9	25-35	1.35-1.55	0.6-2	0.12-0.20	3.0-5.9	1.0-3.0	.32	.32	5	5	56
	9-38	35-45	1.35-1.55	0.2-0.6	0.15-0.20	6.0-8.9	1.0-3.0	.32	.32			
	38-80	30-45	1.40-1.60	0.2-0.6	0.15-0.20	6.0-8.9	0.5-2.0	.32	.32			

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
CrB:												
Clareville----------	0-8	25-35	1.35-1.55	0.6-2	0.12-0.20	3.0-5.9	1.0-3.0	.32	.32	5	5	56
	8-31	35-45	1.35-1.55	0.2-0.6	0.15-0.20	6.0-8.9	1.0-3.0	.32	.32			
	31-80	30-45	1.40-1.60	0.2-0.6	0.15-0.20	6.0-8.9	0.5-2.0	.32	.32			
CsC:												
Colibro-------------	0-6	20-30	1.40-1.60	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28	5	4L	86
	6-48	19-30	1.50-1.70	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	48-60	15-30	1.50-1.70	2-6	0.09-0.14	0.0-2.9	0.5-1.0	.28	.32			
CsD:												
Colibro-------------	0-9	19-25	1.40-1.60	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.37	.37	5	5	56
	9-30	19-30	1.50-1.70	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.32	.32			
	30-80	15-30	1.50-1.70	2-6	0.09-0.14	0.0-2.9	0.5-1.0	.37	.37			
CyB:												
Coy-----------------	0-6	25-40	1.35-1.55	0.2-0.6	0.15-0.20	3.0-5.9	1.0-3.0	.32	.32	5	4	86
	6-14	35-60	1.40-1.60	0.00-0.06	0.14-0.18	6.0-8.9	0.8-1.0	.28	.28			
	14-50	35-55	1.40-1.60	0.00-0.06	0.10-0.18	6.0-8.9	0.5-0.8	.28	.28			
	50-80	40-55	1.40-1.60	0.00-0.06	0.10-0.18	6.0-8.9	0.2-0.5	.28	.28			
CyC:												
Coy-----------------	0-10	27-40	1.35-1.55	0.2-0.6	0.15-0.20	3.0-5.9	1.0-3.0	.32	.32	5	4	86
	10-20	35-60	1.40-1.60	0.00-0.06	0.14-0.18	6.0-8.9	0.8-1.0	.28	.28			
	20-46	35-55	1.40-1.60	0.00-0.06	0.10-0.18	6.0-8.9	0.5-0.8	.28	.28			
	46-80	40-55	1.40-1.60	0.00-0.06	0.10-0.18	6.0-8.9	0.2-0.5	.28	.28			
DaA:												
Dacosta-------------	0-8	20-30	1.35-1.65	0.2-0.6	0.15-0.20	3.0-5.9	0.5-2.0	.32	.32	5	5	56
	8-38	30-45	1.40-1.60	0.00-0.06	0.13-0.16	6.0-8.9	0.5-1.0	.28	.28			
	38-77	22-45	1.35-1.65	0.00-0.06	0.13-0.15	6.0-8.9	0.0-0.2	.37	.37			
	77-80	30-45	1.35-1.60	0.00-0.06	0.13-0.16	6.0-8.9	0.2-0.5	.28	.28			
DAMS:												
Dams----------------	---	---	---	---	---	---	---	---	---	-	---	---

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
DcA:												
Dacosta	0-10	20-30	1.35-1.65	0.2-0.6	0.15-0.20	3.0-5.9	0.5-2.0	.32	.32	5	5	56
	10-43	30-45	1.40-1.60	0.00-0.06	0.13-0.16	6.0-8.9	0.5-1.0	.28	.28			
	43-74	35-45	1.35-1.60	0.00-0.06	0.13-0.16	6.0-8.9	0.2-0.5	.28	.28			
	74-80	24-45	1.35-1.65	0.00-0.06	0.13-0.15	6.0-8.9	0.0-0.2	.37	.37			
Contee	0-8	35-50	1.40-1.50	0.00-0.06	0.14-0.18	6.0-8.9	1.0-3.0	.28	.28	5	4L	86
	8-49	40-50	1.45-1.60	0.00-0.06	0.14-0.18	6.0-8.9	0.5-1.0	.24	.24			
	49-80	35-50	1.50-1.65	0.00-0.06	0.13-0.17	6.0-8.9	0.2-0.5	.17	.28			
DeC:												
Devine	0-10	10-20	1.40-1.65	6-20	0.03-0.11	0.0-2.9	0.5-2.0	.10	.24	4	6	48
	10-47	35-50	1.35-1.60	0.2-0.6	0.03-0.12	1.0-5.9	0.5-1.0	.05	.32			
	47-53	35-50	1.35-1.60	0.2-0.6	0.03-0.12	1.0-5.9	0.5-1.0	.05	.32			
	53-80	10-25	1.25-1.30	0.00-0.2	---	---	0.1-0.5	.05	.32			
DUMPS:												
Dumps, dumps	---	---	---	---	---	---	---	---	---	-	---	---
EbA:												
Edna	0-9	12-20	1.40-1.60	0.6-2	0.10-0.16	0.0-2.9	0.5-3.0	.43	.43	5	3	86
	9-30	35-50	1.35-1.55	0.00-0.06	0.12-0.17	6.0-8.9	0.5-2.0	.32	.32			
	30-50	35-45	1.35-1.55	0.00-0.06	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			
	50-80	30-40	1.40-1.65	0.00-0.06	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			
EdA:												
Edroy	0-7	40-45	1.35-1.55	0.00-0.06	0.10-0.17	6.0-8.9	1.0-4.0	.24	.24	5	4	86
	7-57	40-50	1.35-1.55	0.06-0.2	0.09-0.17	6.0-8.9	1.0-2.0	.24	.24			
	57-70	35-50	1.35-1.55	0.06-0.2	0.09-0.17	6.0-8.9	0.8-1.5	.28	.28			
	70-80	18-35	1.30-1.65	0.2-2	0.05-0.15	0.0-2.9	0.5-0.8	.24	.24			
EnB:												
Elmendorf	0-6	20-34	1.35-1.55	0.2-0.6	0.15-0.20	3.0-5.9	1.0-4.0	.32	.32	5	4L	86
	6-26	35-50	1.30-1.60	0.00-0.06	0.15-0.20	6.0-8.9	1.0-3.0	.32	.32			
	26-55	35-45	1.25-1.60	0.00-0.06	0.04-0.18	6.0-8.9	0.5-1.0	.32	.32			
	55-80	35-45	1.25-1.60	0.00-0.06	0.04-0.18	6.0-8.9	0.5-1.0	.32	.32			
Denhawken	0-6	30-45	1.20-1.50	0.2-0.6	0.13-0.18	3.0-5.9	1.0-4.0	.20	.20	5	4L	86
	6-41	35-50	1.25-1.50	0.00-0.06	0.14-0.18	6.0-8.9	1.0-2.0	.24	.24			
	41-80	35-50	1.45-1.65	0.00-0.06	0.03-0.12	6.0-8.9	0.1-0.3	.49	.49			

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
FdA:												
Faddin--------------	0-16	6-15	1.45-1.65	0.6-2	0.12-0.17	0.0-2.9	1.0-3.0	.43	.43	5	3	86
	16-46	35-57	1.35-1.60	0.00-0.06	0.14-0.19	6.0-8.9	0.5-2.0	.32	.32			
	46-80	30-40	1.45-1.70	0.06-0.2	0.14-0.18	3.0-5.9	0.0-0.5	.32	.32			
GdB:												
Goliad--------------	0-10	10-20	1.40-1.65	2-6	0.10-0.15	0.0-2.9	1.0-3.0	.24	.24	3	3	86
	10-25	30-40	1.40-1.65	0.06-0.6	0.12-0.16	3.0-5.9	0.5-1.0	.28	.28			
	25-35	---	---	0.00-0.01	---	---	---	---	---			
	35-80	---	---	0.00-0.01	---	---	---	---	---			
GoB:												
Goliad--------------	0-13	20-32	1.40-1.65	0.6-2	0.12-0.17	3.0-5.9	1.0-3.0	.20	.20	3	5	56
	13-17	27-40	1.40-1.65	0.2-0.6	0.12-0.16	3.0-5.9	0.5-1.0	.17	.17			
	17-37	37-50	1.40-1.65	0.2-0.6	0.05-0.14	3.0-5.9	0.1-0.5	.17	.17			
	37-49	---	---	0.00-0.01	---	---	---	---	---			
	49-80	---	---	0.00-0.01	---	---	---	---	---			
GrA:												
Greta---------------	0-5	8-18	1.50-1.70	0.6-2	0.08-0.13	0.0-2.9	1.0-1.8	.37	.37	3	3	86
	5-13	25-40	1.50-1.70	0.06-0.2	0.12-0.16	3.0-8.9	0.8-1.5	.24	.24			
	13-34	22-35	1.50-1.75	0.06-0.2	0.11-0.16	2.0-5.9	0.2-0.6	.24	.24			
	34-80	22-35	1.50-1.70	0.06-0.2	0.08-0.16	2.0-5.9	1.8-2.0	.28	.28			
ImA:												
Imogene-------------	0-6	8-18	1.40-1.70	0.6-2	0.10-0.20	0.0-2.9	0.8-1.5	.43	.43	2	3	86
	6-25	20-35	1.50-1.75	0.00-0.06	0.05-0.12	3.0-5.9	0.5-1.0	.24	.24			
	25-65	20-35	1.50-1.75	0.00-0.06	0.05-0.12	3.0-5.9	0.5-0.8	.24	.24			
	65-80	20-34	1.40-1.65	0.06-0.2	0.05-0.11	3.0-5.9	0.2-0.5	.37	.37			
InA:												
Inari---------------	0-11	5-15	1.45-1.61	0.6-2	0.12-0.17	0.0-2.9	1.0-2.5	.32	.32	5	3	86
	11-18	30-45	1.35-1.65	0.00-0.06	0.14-0.19	6.0-8.9	0.2-1.5	.28	.28			
	18-36	25-35	1.45-1.70	0.06-0.2	0.14-0.18	3.0-5.9	0.0-0.2	.28	.28			
	36-80	25-30	1.45-1.70	0.06-0.2	0.14-0.18	3.0-5.9	0.0-0.2	.28	.28			
InB:												
Inari---------------	0-13	5-15	1.45-1.61	0.6-2	0.12-0.17	0.0-2.9	1.0-2.5	.32	.32	5	3	86
	13-40	25-35	1.35-1.65	0.00-0.06	0.14-0.19	6.0-8.9	0.2-0.8	.28	.28			
	40-80	2-30	1.45-1.70	0.06-0.2	0.14-0.18	3.0-5.9	0.0-0.2	.28	.28			

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
KyB:												
Kuy	0-12	2-12	1.50-1.70	6-20	0.07-0.11	0.0-2.9	0.2-1.0	.15	.15	5	1	220
	12-66	2-12	1.50-1.70	6-20	0.07-0.11	0.0-2.9	0.2-0.3	.15	.15			
	66-80	20-35	1.45-1.70	0.6-2	0.12-0.17	0.0-2.9	0.1-0.2	.15	.15			
LaA:												
Laewest	0-6	40-55	1.20-1.45	0.00-0.06	0.15-0.20	9.0-25.0	2.0-5.0	.24	.24	5	4	86
	6-40	40-55	1.20-1.45	0.00-0.06	0.15-0.20	9.0-25.0	1.0-2.5	.24	.24			
	40-62	40-57	1.30-1.50	0.00-0.06	0.15-0.20	9.0-25.0	0.2-0.8	.24	.24			
	62-80	35-38	1.25-1.60	0.00-0.06	0.04-0.18	6.0-8.9	0.5-1.0	.32	.32			
LaB:												
Laewest	0-6	40-55	1.20-1.45	0.00-0.06	0.15-0.20	9.0-25.0	2.0-5.0	.24	.24	5	4	86
	6-46	40-55	1.20-1.45	0.00-0.06	0.15-0.20	9.0-25.0	1.0-2.5	.24	.24			
	46-80	40-57	1.30-1.50	0.00-0.06	0.15-0.20	9.0-25.0	0.2-0.8	.24	.24			
LaD:												
Laewest, eroded	0-10	40-60	1.20-1.45	0.00-0.06	0.15-0.20	9.0-25.0	2.0-6.0	.32	.32	5	4	86
	10-24	40-60	1.20-1.45	0.00-0.06	0.15-0.20	9.0-25.0	1.0-2.0	.32	.32			
	24-60	40-60	1.20-1.45	0.00-0.06	0.15-0.20	9.0-25.0	0.5-2.0	.32	.32			
	60-80	40-60	1.30-1.50	0.00-0.06	0.15-0.20	9.0-25.0	0.5-1.0	.32	.32			
LmB:												
Leming	0-8	4-15	1.40-1.50	2-6	0.05-0.10	0.0-2.9	0.4-1.0	.15	.15	5	2	134
	8-28	3-15	1.40-1.55	2-6	0.03-0.10	0.0-2.9	0.1-1.0	.15	.15			
	28-48	35-45	1.35-1.60	0.06-0.2	0.15-0.20	3.0-5.9	0.1-0.5	.17	.17			
	48-80	25-35	1.60-1.65	0.06-0.2	0.15-0.20	3.0-5.9	0.1-0.5	.17	.17			
MbB:												
Milby	0-11	2-10	1.50-1.70	6-20	0.03-0.10	0.0-2.9	0.5-1.5	.15	.15	5	1	220
	11-28	2-8	1.50-1.70	6-20	0.03-0.10	0.0-2.9	0.1-0.5	.20	.20			
	28-80	20-30	1.60-1.65	0.6-2	0.10-0.15	3.0-5.9	0.1-0.5	.17	.17			
MeA:												
Meguin	0-18	27-38	1.30-1.60	0.6-2	0.15-0.22	1.0-3.0	1.0-5.0	.24	.24	5	4L	86
	18-41	20-35	1.30-1.60	0.6-2	0.15-0.22	1.0-3.0	0.5-1.5	.49	.49			
	41-61	25-35	1.30-1.60	0.6-2	0.15-0.22	1.0-3.0	0.5-1.5	.37	.37			
	61-80	30-55	1.30-1.60	0.6-2	0.15-0.22	3.0-5.9	0.5-1.5	.20	.20			

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
MgA:												
Meguin----------------	0-11	27-38	1.30-1.60	0.6-2	0.15-0.22	1.0-3.0	1.0-5.0	.24	.24	5	4L	86
	11-46	20-35	1.30-1.60	0.6-2	0.15-0.22	1.0-3.0	0.5-1.5	.49	.49			
	46-58	18-35	1.30-1.60	0.6-2	0.15-0.22	1.0-3.0	0.5-1.5	.37	.37			
	58-80	30-55	1.30-1.60	0.6-2	0.15-0.22	3.0-5.9	0.5-1.5	.32	.32			
MoA:												
Monteola-------------	0-8	40-55	1.20-1.45	0.00-0.06	0.13-0.18	9.0-25.0	1.0-4.0	.32	.32	5	4	86
	8-30	40-60	1.20-1.55	0.00-0.06	0.13-0.18	9.0-25.0	0.5-3.0	.37	.37			
	30-62	40-60	1.30-1.60	0.00-0.06	0.13-0.17	9.0-25.0	0.5-1.0	.37	.37			
	62-80	40-60	1.40-1.65	0.00-0.06	0.06-0.13	6.0-8.9	0.5-1.0	.37	.37			
MoB:												
Monteola-------------	0-12	40-55	1.20-1.45	0.00-0.06	0.13-0.18	9.0-25.0	1.0-4.0	.32	.32	5	4	86
	12-26	40-60	1.20-1.55	0.00-0.06	0.13-0.18	9.0-25.0	0.5-3.0	.37	.37			
	26-50	40-60	1.30-1.60	0.00-0.06	0.13-0.17	9.0-25.0	0.5-1.0	.37	.37			
	50-80	40-60	1.40-1.65	0.00-0.06	0.06-0.13	6.0-8.9	0.5-1.0	.37	.37			
MoC:												
Monteola-------------	0-8	40-55	1.20-1.45	0.00-0.06	0.13-0.18	9.0-25.0	1.0-4.0	.32	.32	5	4	86
	8-23	40-60	1.20-1.55	0.00-0.06	0.13-0.18	9.0-25.0	0.5-3.0	.37	.37			
	23-54	40-60	1.30-1.60	0.00-0.06	0.13-0.17	9.0-25.0	0.5-1.0	.37	.37			
	54-80	40-60	1.40-1.65	0.00-0.06	0.06-0.13	6.0-8.9	0.5-1.0	.37	.37			
NuC:												
Nusil----------------	0-5	1-10	1.35-1.50	6-20	0.05-0.08	0.0-2.9	0.5-1.0	.17	.17	5	1	220
	5-23	1-13	1.35-1.65	2-20	0.05-0.11	0.0-2.9	0.1-1.0	.17	.17			
	23-53	18-35	1.65-1.75	0.06-0.2	0.12-0.17	3.0-5.9	0.1-1.0	.24	.24			
	53-80	14-35	1.60-1.70	0.2-0.6	0.08-0.12	3.0-5.9	0.1-1.0	.24	.24			
OdA:												
Odem-----------------	0-28	7-18	1.40-1.65	2-6	0.10-0.16	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	28-59	7-18	1.40-1.65	2-6	0.10-0.16	0.0-2.9	1.0-3.0	.24	.24			
	59-80	7-18	1.40-1.65	2-6	0.10-0.16	0.0-2.9	0.5-2.0	.24	.24			
Riverwash------------	0-80	5-20	1.40-1.60	2-20	0.02-0.12	0.0-2.9	0.0-0.5	.17	.17	5	1	220
OmD:												
Olmedo---------------	0-6	12-21	1.25-1.55	0.6-2	0.05-0.10	0.0-2.9	1.0-5.0	.10	.28	1	6	48
	6-14	12-21	1.30-1.55	0.6-2	0.05-0.10	0.0-2.9	1.0-3.0	.10	.32			
	14-23	---	---	0.00-0.01	---	---	---	---	---			
	23-80	4-8	1.25-1.30	0.00-0.2	0.11-0.18	0.0-2.9	0.1-0.5	.37	.37			

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
OrA:												
Orelia--------------	0-5	6-15	1.30-1.55	0.2-0.6	0.10-0.16	0.0-2.9	1.0-2.0	.32	.32	5	3	86
	5-39	28-35	1.45-1.65	0.06-0.2	0.10-0.17	3.0-5.9	0.5-1.0	.24	.24			
	39-80	20-35	1.45-1.70	0.00-0.06	0.09-0.17	3.0-5.9	0.1-0.5	.24	.24			
PaB:												
Papalote------------	0-9	2-10	1.55-1.70	6-20	0.05-0.10	0.0-2.9	0.5-1.0	.28	.28	5	2	134
	9-28	35-45	1.35-1.60	0.06-0.2	0.13-0.18	3.0-5.9	0.2-0.8	.17	.17			
	28-36	22-38	1.50-1.60	0.06-0.2	0.13-0.18	3.0-5.9	0.2-0.8	.20	.20			
	36-80	22-30	1.50-1.70	0.06-0.2	0.12-0.17	3.0-5.9	0.1-0.5	.37	.37			
PbA:												
Papalote------------	0-8	6-17	1.45-1.70	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	8-24	35-45	1.35-1.60	0.06-0.2	0.13-0.18	3.0-5.9	0.2-0.8	.24	.24			
	24-52	30-35	1.45-1.70	0.06-0.2	0.12-0.17	3.0-5.9	0.1-0.5	.24	.24			
	52-80	22-35	1.45-1.70	0.06-0.2	0.12-0.17	3.0-5.9	0.1-0.5	.24	.24			
PbB:												
Papalote------------	0-8	6-17	1.45-1.70	2-6	0.11-0.16	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	8-27	35-45	1.35-1.60	0.06-0.2	0.13-0.18	3.0-5.9	0.2-0.8	.20	.20			
	27-34	22-35	1.50-1.60	0.06-0.2	0.13-0.18	3.0-5.9	0.2-0.8	.20	.20			
	34-80	22-30	1.50-1.70	0.06-0.2	0.12-0.17	3.0-5.9	0.1-0.5	.20	.20			
PITS:												
Pits, borrow--------	---	---	---	---	---	---	---	---	---	-	---	---
PrB:												
Parrita-------------	0-6	16-30	1.35-1.55	0.6-2	0.11-0.16	0.0-2.9	1.0-3.0	.24	.24	2	5	56
	6-18	25-35	1.35-1.55	0.6-2	0.12-0.17	3.0-5.9	1.0-2.0	.20	.20			
	18-33	---	---	0.00-0.01	---	---	---	---	---			
	33-80	10-20	1.25-1.30	0.00-0.2	0.11-0.18	0.0-2.9	0.1-0.5	.37	.37			
PtC:												
Pernitas------------	0-11	20-32	1.35-1.60	0.6-2	0.11-0.16	0.0-2.9	1.0-3.0	.20	.20	5	5	56
	11-29	21-35	1.30-1.55	0.6-2	0.13-0.18	3.0-5.9	0.5-2.0	.20	.20			
	29-80	21-35	1.30-1.55	0.6-2	0.13-0.18	3.0-5.9	0.1-1.0	.24	.24			
PuC:												
Pettus--------------	0-11	20-35	1.45-1.60	0.6-2	0.10-0.15	0.0-2.9	1.0-3.0	.32	.32	3	4L	86
	11-25	20-34	1.45-1.65	0.6-2	0.08-0.12	0.0-2.9	1.0-3.0	.10	.32			
	25-35	18-26	1.45-1.60	0.6-2	0.02-0.05	0.0-2.9	0.1-1.0	.10	.37			
	35-80	15-26	1.50-1.65	0.6-6	0.03-0.08	0.0-2.9	0.1-1.0	.15	.32			

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
RaB:												
Raisin--------------	0-5	3-12	1.50-1.60	2-6	0.07-0.11	0.0-2.9	0.1-1.2	.24	.24	5	2	134
	5-19	3-12	1.50-1.65	2-6	0.07-0.11	0.0-2.9	0.1-0.7	.24	.24			
	19-25	30-38	1.30-1.70	0.2-0.6	0.10-0.20	3.0-5.9	0.1-0.5	.17	.17			
	25-67	22-30	1.30-1.70	0.2-0.6	0.10-0.20	3.0-5.9	0.1-0.5	.20	.20			
	67-80	18-28	1.10-1.55	0.6-2	0.10-0.17	3.0-5.9	0.1-0.5	.32	.32			
RaC:												
Raisin--------------	0-9	3-12	1.50-1.60	2-6	0.07-0.11	0.0-2.9	0.1-1.2	.24	.24	5	2	134
	9-19	30-35	1.30-1.70	0.2-0.6	0.10-0.20	3.0-5.9	0.1-0.5	.15	.15			
	19-38	22-35	1.30-1.70	0.2-0.6	0.10-0.20	3.0-5.9	0.1-0.5	.17	.17			
	38-80	18-28	1.10-1.55	0.6-2	0.10-0.17	3.0-5.9	0.1-0.5	.10	.10			
RaC2:												
Raisin--------------	0-4	8-18	1.30-1.55	2-6	0.11-0.16	0.0-2.9	1.0-2.0	.32	.32	5	2	134
	4-18	29-35	1.30-1.60	0.6-2	0.14-0.20	3.0-9.0	0.5-1.0	.17	.17			
	18-80	20-33	1.20-1.60	0.2-0.6	0.14-0.20	3.0-9.0	0.1-1.0	.20	.20			
RnB:												
Raisin--------------	0-11	8-18	1.30-1.55	2-6	0.11-0.16	0.0-2.9	1.0-2.0	.32	.32	5	3	86
	11-20	29-35	1.30-1.60	0.6-2	0.14-0.20	3.0-9.0	0.5-1.0	.15	.15			
	20-35	22-30	1.50-1.70	0.6-2	0.14-0.20	3.0-9.0	0.1-1.0	.20	.20			
	35-80	20-30	1.20-1.60	0.2-0.6	0.14-0.20	3.0-9.0	0.1-1.0	.20	.20			
RoA:												
Realitos------------	0-6	40-45	1.35-1.60	0.00-0.06	0.12-0.18	9.0-25.0	1.0-4.0	.32	.32	5	4	86
	6-23	40-60	1.35-1.60	0.00-0.06	0.12-0.18	9.0-25.0	1.0-4.0	.32	.32			
	23-75	40-60	1.35-1.60	0.00-0.06	0.12-0.18	9.0-25.0	1.0-3.0	.32	.32			
	75-80	30-38	1.25-1.50	0.00-0.06	0.12-0.17	9.0-25.0	0.5-2.0	.24	.24			
RsC:												
Rhymes--------------	0-10	1-10	1.35-1.50	6-20	0.05-0.08	0.0-2.9	0.5-1.0	.17	.17	5	1	220
	10-64	1-13	1.35-1.50	2-20	0.05-0.11	0.0-2.9	0.1-1.0	.17	.17			
	64-80	18-35	1.50-1.65	0.2-0.6	0.12-0.17	3.0-5.9	0.1-1.0	.24	.24			
RuB:												
Runge---------------	0-14	10-20	1.35-1.55	0.6-2	0.11-0.15	0.0-2.9	1.0-4.0	.15	.15	5	3	86
	14-51	20-35	1.45-1.65	0.6-2	0.15-0.20	3.0-5.9	0.5-2.0	.15	.15			
	51-80	18-33	1.40-1.65	0.6-2	0.10-0.15	3.0-5.9	0.3-1.0	.17	.17			

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
RyA:												
Rydolph-------------	0-9	40-50	1.20-1.40	0.06-0.2	0.12-0.18	3.0-5.9	1.0-3.0	.37	.37	5	4	86
	9-80	20-40	1.20-1.45	0.06-0.2	0.12-0.20	3.0-5.9	0.3-3.0	.43	.43			
ScB:												
Sarco---------------	0-5	2-10	1.65-1.80	6-20	0.05-0.10	0.0-2.9	0.8-1.2	.24	.24	5	1	220
	5-12	1-10	1.65-1.80	6-20	0.05-0.10	0.0-2.9	0.3-0.8	.24	.24			
	12-20	30-45	1.40-1.55	0.06-0.2	0.13-0.18	3.0-5.9	0.5-0.8	.15	.15			
	20-32	15-30	1.55-1.70	0.06-0.2	0.12-0.17	3.0-5.9	0.1-0.6	.17	.17			
	32-80	15-30	1.55-1.70	0.06-0.2	0.12-0.17	3.0-5.9	0.1-0.5	.20	.20			
SnC:												
Sarnosa-------------	0-11	8-20	1.35-1.55	0.6-2	0.10-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	11-37	8-22	1.40-1.60	0.6-2	0.10-0.15	0.0-2.9	0.5-2.0	.24	.24			
	37-80	8-25	1.40-1.65	2-6	0.06-0.12	0.0-2.9	0.1-1.0	.24	.24			
SnD:												
Sarnosa-------------	0-7	8-18	1.35-1.55	0.6-2	0.10-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	7-29	8-18	1.40-1.60	0.6-2	0.10-0.15	0.0-2.9	0.5-2.0	.28	.28			
	29-80	8-25	1.40-1.65	2-6	0.06-0.12	0.0-2.9	0.1-1.0	.24	.24			
StC:												
Schattel------------	0-13	27-35	1.15-1.35	0.6-2	0.11-0.18	3.0-5.9	0.5-2.0	.24	.24	3	4L	86
	13-39	35-55	1.20-1.45	0.2-0.6	0.08-0.15	6.0-8.9	0.5-1.0	.24	.24			
	39-52	35-55	1.65-1.80	0.06-0.2	0.03-0.08	6.0-8.9	0.1-0.5	.24	.24			
	52-80	35-60	1.65-1.80	0.06-0.2	0.03-0.08	6.0-8.9	0.1-0.5	.24	.24			
SwA:												
Sinton--------------	0-17	20-35	1.35-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.24	.24	5	5	56
	17-41	20-35	1.35-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.20	.20			
	41-80	12-35	1.35-1.60	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.24	.24			
TeA:												
Telferner-----------	0-9	8-18	1.45-1.60	0.6-2	0.10-0.15	0.0-2.9	0.5-1.0	.43	.43	5	3	86
	9-29	35-50	1.35-1.65	0.00-0.06	0.12-0.17	6.0-8.9	0.3-0.5	.32	.32			
	29-80	20-40	1.35-1.65	0.06-0.2	0.12-0.15	3.0-5.9	0.1-0.5	.32	.32			
TeB:												
Telferner-----------	0-12	8-18	1.45-1.60	0.6-2	0.10-0.15	0.0-2.9	0.5-1.0	.43	.43	5	3	86
	12-40	35-50	1.35-1.65	0.00-0.06	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			
	40-80	20-40	1.35-1.65	0.06-0.2	0.12-0.15	3.0-5.9	0.1-0.5	.32	.32			

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
ToA:												
Tiocano	0-9	40-60	1.25-1.50	0.00-0.06	0.12-0.18	9.0-25.0	1.0-4.0	.32	.32	5	4	86
	9-34	40-60	1.25-1.50	0.00-0.06	0.12-0.17	9.0-25.0	0.5-2.0	.32	.32			
	34-67	30-38	1.25-1.50	0.00-0.06	0.12-0.17	9.0-25.0	0.5-2.0	.24	.24			
	67-80	15-20	1.50-1.65	2-6	0.11-0.15	0.0-2.9	1.0-2.0	.20	.20			
UsB:												
Ustarents	0-6	25-35	1.35-1.60	0.6-2	0.12-0.18	3.0-5.9	0.5-2.0	.24	.24	5	6	48
	6-60	25-40	1.35-1.60	0.6-2	0.12-0.18	3.0-5.9	0.1-0.5	.24	.24			
VdA:												
Vidauri	0-4	8-20	1.35-1.65	0.6-2	0.10-0.15	0.0-2.9	0.5-3.2	.32	.32	5	3	86
	4-41	25-35	1.35-1.70	0.00-0.06	0.10-0.15	1.0-6.0	0.3-0.8	.49	.49			
	41-49	25-35	1.45-1.75	0.06-0.2	0.09-0.14	1.0-6.0	0.1-0.5	.24	.24			
	49-80	20-35	1.45-1.75	0.06-0.2	0.09-0.14	1.0-6.0	0.1-0.5	.24	.24			
VwA:												
Vidauri	0-4	12-20	1.35-1.65	0.6-2	0.10-0.15	0.0-2.9	0.5-3.2	.32	.32	5	3	86
	4-34	25-35	1.35-1.70	0.00-0.06	0.10-0.15	1.0-6.0	0.3-0.8	.49	.49			
	34-80	25-33	1.45-1.75	0.06-0.2	0.09-0.14	1.0-6.0	0.1-0.5	.24	.24			
Wyick	0-9	5-12	1.40-1.70	0.6-2	0.08-0.13	0.0-2.9	1.0-1.5	.43	.43	5	3	86
	9-15	25-45	1.35-1.65	0.00-0.06	0.08-0.14	3.0-8.9	0.8-1.2	.24	.24			
	15-34	20-35	1.35-1.65	0.00-0.06	0.08-0.14	3.0-5.9	0.2-0.6	.28	.28			
	34-80	22-35	1.30-1.60	0.2-0.6	0.06-0.14	3.0-5.9	0.0-0.2	.32	.32			
W:												
Water	---	---	---	---	---	---	---	---	---	-	---	---
WcC:												
Weesatche	0-10	10-20	1.35-1.55	0.6-2	0.11-0.15	0.0-2.9	1.0-4.0	.17	.17	5	3	86
	10-50	20-35	1.30-1.50	0.6-2	0.15-0.20	3.0-5.9	0.5-2.0	.15	.15			
	50-80	16-33	1.30-1.55	0.6-2	0.10-0.15	3.0-5.9	0.3-1.0	.15	.15			
WeA:												
Weesatche	0-9	20-27	1.30-1.50	0.6-2	0.12-0.17	3.0-5.9	1.0-4.0	.32	.32	5	5	56
	9-27	20-35	1.30-1.50	0.6-2	0.15-0.20	3.0-5.9	0.5-2.0	.32	.32			
	27-80	16-33	1.30-1.55	0.6-2	0.10-0.15	3.0-5.9	0.3-1.0	.32	.32			

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
WeB:												
Weesatche-----------	0-5	20-30	1.30-1.50	0.6-2	0.12-0.17	3.0-5.9	1.0-5.0	.32	.32	5	5	56
	5-28	20-38	1.30-1.50	0.6-2	0.15-0.20	3.0-5.9	0.5-3.0	.32	.32			
	28-80	20-33	1.30-1.55	0.6-2	0.10-0.15	3.0-5.9	0.3-1.0	.32	.32			
WeB2:												
Weesatche, eroded---	0-6	20-30	1.30-1.50	0.6-2	0.12-0.17	3.0-5.9	1.0-5.0	.32	.32	5	5	56
	6-25	20-35	1.30-1.50	0.6-2	0.15-0.20	3.0-5.9	0.5-3.0	.32	.32			
	25-80	16-33	1.30-1.55	0.6-2	0.10-0.15	3.0-5.9	0.3-1.0	.32	.32			
WeC:												
Weesatche-----------	0-7	20-30	1.30-1.50	0.6-2	0.12-0.17	3.0-5.9	1.0-5.0	.32	.32	5	5	56
	7-33	20-35	1.30-1.50	0.6-2	0.15-0.20	3.0-5.9	0.5-3.0	.32	.32			
	33-80	16-33	1.30-1.55	0.6-2	0.10-0.15	3.0-5.9	0.3-1.0	.32	.32			
WoA:												
Woodsboro-----------	0-6	10-20	1.40-1.60	0.6-2	0.05-0.10	0.0-2.9	0.5-2.0	.32	.32	2	3	86
	6-32	35-45	1.45-1.65	0.00-0.06	0.00-0.02	6.0-8.9	0.2-1.0	.24	.24			
	32-38	30-35	1.40-1.60	0.00-0.06	0.00-0.02	6.0-8.9	0.2-1.0	.24	.24			
	38-80	20-35	1.40-1.60	0.00-0.06	0.00-0.02	6.0-8.9	0.2-1.0	.24	.24			
WyA:												
Wyick---------------	0-6	5-12	1.40-1.70	0.6-2	0.08-0.13	0.0-2.9	1.0-1.5	.43	.43	5	3	86
	6-12	32-45	1.35-1.65	0.00-0.06	0.08-0.14	3.0-8.9	0.8-1.2	.24	.24			
	12-30	20-35	1.35-1.65	0.00-0.06	0.08-0.14	3.0-5.9	0.2-0.6	.28	.28			
	30-80	20-35	1.30-1.60	0.2-0.6	0.06-0.14	3.0-5.9	0.0-0.2	.32	.32			
ZaA:												
Zalco---------------	0-10	1-8	1.35-1.55	6-20	0.05-0.11	0.0-2.9	0.2-1.0	.17	.17	5	1	220
	10-80	1-8	1.35-1.55	6-20	0.05-0.11	0.0-2.9	0.2-0.5	.17	.17			
ZcA:												
Zalco---------------	0-6	1-8	1.35-1.55	6-20	0.05-0.11	0.0-2.9	0.2-1.0	.17	.17	5	1	220
	6-80	1-8	1.35-1.55	6-20	0.05-0.11	0.0-2.9	0.2-0.5	.17	.17			
ZkA:												
Zunker--------------	0-12	8-20	1.50-1.65	2-6	0.11-0.15	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	12-77	7-18	1.60-1.70	2-6	0.07-0.15	0.0-2.9	0.5-1.0	.17	.17			
	77-80	15-32	1.40-1.60	2-6	0.10-0.16	0.0-2.9	0.5-1.0	.28	.28			

Table 26.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	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	g/cc	In/hr	In/in	Pct	Pct					
ZnA:												
Zunker---------------	0-9	8-20	1.50-1.65	2-6	0.11-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	9-26	7-18	1.60-1.70	2-6	0.07-0.15	0.0-2.9	0.5-1.0	.24	.24			
	26-80	10-20	1.70-1.80	2-6	0.10-0.16	0.0-2.9	0.5-1.0	.24	.24			

Table 27.--Chemical Soil Properties

(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
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
AnA:								
Ander	0-12	5.7-15	---	6.1-7.3	0	0	0	0
	12-30	25-33	---	6.1-7.8	0	0	0.0-0.5	0-6
	30-48	18-26	---	6.6-7.8	0-5	0	0.0-1.0	2-8
	48-80	10-26	---	7.4-8.4	5-15	0	0.0-2.0	6-13
AnB:								
Ander	0-12	5.7-15	---	6.1-7.3	0	0	0	0
	12-17	25-33	---	6.1-7.8	0	0	0.0-0.5	0-6
	17-38	18-26	---	6.6-7.8	0-5	0	0.0-1.0	2-8
	38-80	10-26	---	7.4-8.4	5-15	0	0.0-2.0	6-13
BnB:								
Blanconia	0-9	---	1.9-6.9	5.1-6.0	0	0	0.0-1.0	0
	9-15	0.5-8.9	---	5.1-6.0	0	0	0.0-1.0	0
	15-30	25-33	---	5.6-7.3	0	0	0.0-2.0	2-8
	30-50	17-26	---	6.6-7.8	1-5	0	0.0-2.0	2-8
	50-80	12-26	---	7.4-8.4	1-15	0	0.0-2.0	2-8
BsA:								
Buchel	0-7	30-45	---	7.4-8.4	20-30	0	0.0-2.0	0-2
	7-36	29-44	---	7.4-8.4	20-30	0	0.0-2.0	0-13
	36-80	28-44	---	7.4-8.4	20-30	0	0.0-8.0	5-20
BuA:								
Buchel	0-7	30-45	---	7.4-8.4	20-30	0	0.0-2.0	0-2
	7-55	29-44	---	7.4-8.4	20-30	0	0.0-2.0	0-13
	55-80	28-44	---	7.4-8.4	20-30	0	0.0-8.0	5-20
CnA:								
Cieno	0-7	---	5.1-9.5	5.1-7.3	0	0	0.0-2.0	0
	7-36	12-19	---	5.1-7.3	0-2	0	0.0-2.0	0-6
	36-80	12-18	---	6.1-7.8	0-5	0	0.0-2.0	0-6
CrA:								
Clareville	0-9	20-28	---	6.6-7.8	0	0	0	0
	9-38	27-34	---	6.6-7.8	0	0	0	0
	38-80	23-34	---	7.9-8.4	5-30	0	0	0
CrB:								
Clareville	0-8	20-28	---	6.6-7.8	0	0	0	0
	8-31	27-34	---	6.6-7.8	0	0	0	0
	31-80	23-34	---	7.9-8.4	5-30	0	0	0
CsC:								
Colibro	0-6	12-23	---	7.9-8.4	30-50	0	0	0
	6-48	12-26	---	7.9-8.4	40-70	0	0	0
	48-60	6.8-16	---	7.9-8.4	30-50	0	0	0
CsD:								
Colibro	0-9	12-17	---	7.9-8.4	30-50	0	0	0
	9-30	12-20	---	7.9-8.4	40-70	0	0	0
	30-80	9.5-20	---	7.9-8.4	30-50	0	0	0
CyB:								
Coy	0-6	22-34	---	7.9-8.4	0	0	0.0-1.0	0-5
	6-14	27-43	---	7.9-8.4	0-10	0-5	0.0-1.0	2-5
	14-50	15-35	---	7.9-8.4	2-20	0-10	2.0-8.0	4-15
	50-80	15-35	---	7.9-8.4	2-20	0-10	2.0-8.0	4-15

Table 27.--Chemical Soil Properties--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
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
CyC:								
Coy	0-10	22-34	---	7.9-8.4	0	0	0.0-1.0	0-5
	10-20	27-43	---	7.9-8.4	0-10	0-5	0.0-1.0	2-5
	20-46	15-35	---	7.9-8.4	2-20	0-10	2.0-8.0	4-15
	46-80	15-35	---	7.9-8.4	2-20	0-10	2.0-8.0	4-15
DaA:								
Dacosta	0-8	16-24	---	6.1-7.3	0	0	0.0-2.0	0-2
	8-38	20-33	---	6.1-7.8	0	0	0.2-1.0	2-6
	38-77	15-22	---	7.4-7.8	0-5	0	2.0-4.0	6-12
	77-80	15-25	---	6.6-7.8	0-5	0	2.0-6.0	6-12
DAMS:								
Dams	---	---	---	---	---	---	---	---
DcA:								
Dacosta	0-10	16-24	---	6.1-7.3	0	0	0.0-1.0	0-2
	10-43	20-33	---	6.1-7.8	0	0	0.2-1.0	2-6
	43-74	15-25	---	6.1-7.8	0-5	0	2.0-6.0	6-12
	74-80	15-22	---	7.4-8.4	0-5	0	2.0-6.0	6-12
Contee	0-8	20-31	---	7.9-8.4	5-25	0	0.0-1.0	0-2
	8-49	20-30	---	7.9-8.4	10-30	0-2	0.0-2.0	0-4
	49-80	13-30	---	7.9-8.4	10-25	2-6	0.0-6.0	4-16
DeC:								
Devine	0-10	6.5-14	---	5.6-7.3	0	0	0	0
	10-47	18-27	---	5.6-7.3	0	0	0.0-0.5	0
	47-53	18-27	---	6.6-7.8	0-10	0	0.0-1.0	0
	53-80	4.0-7.0	---	7.4-8.4	60-75	0	0.2-2.0	1-6
DUMPS:								
Dumps, dumps	---	---	---	---	---	---	---	---
EbA:								
Edna	0-9	10-17	---	5.1-7.3	0	0	0.0-0.5	0-2
	9-30	26-37	---	5.6-7.3	0	0	0.0-1.0	0-4
	30-50	26-33	---	6.6-8.4	0-3	0	0.0-2.0	0-6
	50-80	23-30	---	7.4-8.4	0-10	0	0.0-2.0	0-8
EdA:								
Edroy	0-7	28-41	---	6.1-7.3	0	0	0.0-2.0	0-2
	7-57	25-37	---	6.6-7.8	0	0	0.0-2.0	0-8
	57-70	25-37	---	7.4-8.4	0-5	0	0.0-4.0	2-8
	70-80	5.0-30	---	7.4-8.4	0-5	0-2	0.0-2.0	2-14
EnB:								
Elmendorf	0-6	17-27	---	6.1-8.4	0	0	0.0-1.0	0-2
	6-26	17-38	---	6.6-8.4	0	0	0.0-2.0	0-6
	26-55	23-33	---	7.4-8.4	2-35	0-25	2.0-4.0	4-35
	55-80	11-29	---	7.4-8.4	2-35	0-25	2.0-8.0	4-35
Denhawken	0-6	24-35	---	7.4-8.4	2-15	0	0.0-2.0	0-4
	6-41	24-37	---	7.4-8.4	2-25	0-10	0.0-2.0	0-6
	41-80	14-30	---	7.4-8.4	5-15	0-15	2.0-16.0	4-13
FdA:								
Faddin	0-16	5.9-13	---	6.1-7.3	0	0	0	0-2
	16-46	26-42	---	6.1-8.4	0	0	0.0-1.0	2-4
	46-80	17-32	---	7.4-8.4	10-35	0	0.0-2.0	4-8

Table 27.--Chemical Soil Properties--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
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
GdB:								
Goliad---------------	0-10	9.1-17	---	6.6-8.4	0-1	0	0	0
	10-25	23-30	---	6.6-8.4	0-1	0	0	0
	25-35	---	---	---	50-80	0	0	0
	35-80	---	---	---	50-80	0	0	0
GoB:								
Goliad---------------	0-13	11-17	---	6.6-8.4	0-1	0	0	0
	13-17	14-21	---	6.6-8.4	0-1	0	0	0
	17-37	18-26	---	7.4-8.4	10-45	0	0	0
	37-49	---	---	---	50-80	0	0	0
	49-80	---	---	---	50-80	0	0	0
GrA:								
Greta----------------	0-5	3.0-10	---	6.1-7.3	0	0	0.3-2.0	2-4
	5-13	15-25	---	6.6-7.8	0	0	0.5-4.0	6-20
	13-34	15-25	---	7.4-8.4	0-5	0	2.0-4.0	13-20
	34-80	15-25	---	7.4-8.4	5-25	0	2.0-6.0	13-20
ImA:								
Imogene--------------	0-6	7.2-15	---	6.1-7.8	0	0	2.0-4.0	4-13
	6-25	16-28	---	6.6-8.4	0	0-5	2.0-6.0	25-40
	25-65	16-27	---	6.6-8.4	0-5	0-5	2.0-6.0	25-40
	65-80	7.2-40	---	7.4-9.0	0-30	0-7	2.0-8.0	20-40
InA:								
Inari----------------	0-11	5.6-13	---	5.6-6.5	0	0	0.0-1.0	0-2
	11-18	20-27	---	5.6-6.5	0	0	0.0-1.0	0-4
	18-36	17-23	---	6.6-7.8	0	0	0.0-2.0	0-6
	36-80	17-23	---	7.4-8.4	1-10	0	0.0-2.0	0-6
InB:								
Inari----------------	0-13	5.6-13	---	5.6-6.5	0	0	0.0-1.0	0-2
	13-40	20-27	---	5.6-7.3	0	0	0.0-1.0	0-4
	40-80	17-23	---	7.4-8.4	1-10	0	0.0-2.0	0-8
KyB:								
Kuy------------------	0-12	1.1-6.5	---	5.6-7.3	0	0	0	0
	12-66	2.7-6.4	---	5.6-7.3	0	0	0	0
	66-80	10-18	---	5.1-6.5	0	0	0.0-2.0	0-2
LaA:								
Laewest--------------	0-6	31-50	---	6.1-7.8	0	0	0	0-2
	6-40	30-50	---	6.1-7.8	0	0	0.0-1.0	0-6
	40-62	25-50	---	6.6-8.4	5-20	0	0.0-4.0	0-13
	62-80	11-29	---	7.9-8.4	2-35	0-25	2.0-8.0	4-35
LaB:								
Laewest--------------	0-6	31-50	---	6.1-7.8	0	0	0	0-2
	6-46	30-50	---	6.1-7.8	0	0	0.0-1.0	0-6
	46-80	25-50	---	6.6-8.4	5-20	0	0.0-4.0	0-13
LaD:								
Laewest, eroded------	0-10	31-45	---	5.6-7.8	0	0	0.0-2.0	0-2
	10-24	30-44	---	5.6-7.8	0	0	0.0-2.0	0-2
	24-60	29-44	---	6.6-8.4	1-5	0	0.0-2.0	0-5
	60-80	26-43	---	6.6-8.4	5-20	0	0.0-2.0	0-5

Table 27.--Chemical Soil Properties--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
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
LmB:								
Leming----------------	0-8	2.2-8.1	---	6.1-7.3	0	0	0	0
	8-28	1.6-8.1	---	6.1-7.3	0	0	0	0
	28-48	18-24	---	6.1-7.3	0	0	0.0-1.0	0-2
	48-80	13-18	---	6.1-8.4	0-10	0	0.0-1.0	0-2
MbB:								
Milby-----------------	0-11	1.1-5.4	---	5.1-7.3	0	0	0	0
	11-28	1.1-5.4	---	5.1-7.3	0	0	0	0
	28-80	10-16	---	5.6-6.5	0	0	0.0-2.0	0
MeA:								
Meguin----------------	0-18	22-32	---	7.4-8.4	5-30	0	0	0
	18-41	16-28	---	7.4-8.4	15-30	0-1	0.0-1.0	0-2
	41-61	15-28	---	7.9-8.4	15-30	0-1	0.0-1.0	0-2
	61-80	27-42	---	7.9-8.4	15-30	0-1	0.0-2.0	0-13
MgA:								
Meguin----------------	0-11	22-32	---	7.4-8.4	15-30	0	0	0
	11-46	16-28	---	7.9-8.4	15-30	0-1	0.0-1.0	0-2
	46-58	15-28	---	7.9-8.4	15-30	0-1	0.0-1.0	0-2
	58-80	20-42	---	7.9-8.4	15-30	0-1	0.0-2.0	0-13
MoA:								
Monteola--------------	0-8	30-41	---	7.4-8.4	0-10	0	0.0-1.0	0-2
	8-30	29-44	---	7.4-8.4	0-10	0-3	0.1-1.0	0-4
	30-62	29-43	---	7.4-8.4	0-15	2-5	0.2-2.0	0-8
	62-80	29-43	---	7.4-9.0	0-15	2-5	0.5-4.0	2-12
MoB:								
Monteola--------------	0-8	30-41	---	7.4-8.4	0-10	0	0.0-1.0	0-2
	8-30	29-44	---	7.4-8.4	0-10	0-3	0.1-1.0	0-4
	30-62	29-43	---	7.4-8.4	0-15	2-5	0.2-2.0	0-8
	62-80	29-43	---	7.4-9.0	0-15	2-5	0.5-4.0	2-12
MoC:								
Monteola--------------	0-8	30-41	---	7.4-8.4	0-10	0	0.0-1.0	0-2
	8-30	29-44	---	7.4-8.4	0-10	0-3	0.1-1.0	0-4
	30-62	29-43	---	7.4-8.4	0-15	2-5	0.2-2.0	0-8
	62-80	29-43	---	7.4-9.0	0-15	2-5	0.5-4.0	2-12
NuC:								
Nusil-----------------	0-5	---	0.2-2.9	6.1-7.8	0	0	0	0
	5-23	---	---	6.1-7.8	0	0	0	0
	23-53	9.3-19	---	6.1-7.8	0	0	0.0-1.0	0-4
	53-80	7.3-19	---	6.1-8.4	0-5	0	0.0-2.0	0-4
OdA:								
Odem------------------	0-28	6.4-16	---	6.1-8.4	0	0	0.0-2.0	0
	28-59	6.4-16	---	6.6-8.4	0	0	0.0-2.0	0
	59-80	6.3-16	---	6.6-8.4	0-5	0	0.0-2.0	0
Riverwash-------------	0-80	---	---	7.4-8.4	0-2	0	0.0-2.0	0
OmD:								
Olmedo----------------	0-6	9.4-22	---	7.4-8.4	40-70	0	0.0-1.0	0-2
	6-14	5.0-20	---	7.4-8.4	40-70	0	0.0-1.0	0-2
	14-23	---	---	7.9-8.4	---	---	---	---
	23-80	4.0-7.0	---	7.4-8.4	60-75	0	0.2-2.0	1-6

Table 27.--Chemical Soil Properties--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
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
OrA:								
Orelia----------------	0-5	5.6-13	---	6.1-7.3	0	0	0.0-1.0	0-2
	5-39	22-28	---	6.6-7.8	0-5	0	0.2-2.0	1-6
	39-80	15-27	---	7.9-8.4	5-20	0-2	2.0-4.0	10-20
PaB:								
Papalote-------------	0-9	2.2-9.1	---	5.6-7.8	0	0	0	0
	9-28	25-33	---	6.1-7.8	0	0	0.0-0.5	0
	28-36	17-27	---	6.6-8.4	0	0	0.0-0.5	0
	36-80	17-23	---	6.6-8.4	0-5	0	0.0-1.0	0
PbA:								
Papalote-------------	0-8	5.7-14	---	5.6-7.8	0	0	0	0
	8-24	25-30	---	6.1-7.8	0	0	0.0-1.0	0-4
	24-52	22-26	---	7.4-8.4	0-5	0	0.0-2.0	0-4
	52-80	17-26	---	7.4-8.4	0-5	0	0.0-2.0	0-4
PbB:								
Papalote-------------	0-8	5.7-14	---	5.6-7.3	0	0	0	0
	8-27	25-33	---	6.1-7.3	0	0	0.0-0.5	0
	27-34	17-27	---	6.6-8.4	0	0	0.0-0.5	0
	34-80	17-23	---	6.6-8.4	0-5	0	0.0-1.0	0
PITS:								
Pits, borrow---------	---	---	---	---	---	---	---	---
PrB:								
Parrita--------------	0-6	14-25	---	6.6-8.4	0-1	0	0	0
	6-18	20-28	---	6.6-8.4	0-5	0	0	0
	18-33	---	---	7.9-8.4	---	---	---	---
	33-80	4.0-7.0	---	7.9-8.4	60-75	0	0.2-2.0	1-6
PtC:								
Pernitas-------------	0-11	17-26	---	7.4-8.4	5-10	0	0	0
	11-29	17-28	---	7.4-8.4	8-30	0	0	0
	29-80	16-28	---	7.9-8.4	15-35	0	0	0
PuC:								
Pettus---------------	0-11	14-30	---	7.9-8.4	15-40	0	0.0-2.0	0
	11-25	14-30	---	7.9-8.4	30-40	0	0.0-2.0	0
	25-35	7.3-18	---	7.9-8.4	40-65	0	0.0-2.0	0
	35-80	6.3-18	---	7.9-8.4	40-65	0	0.0-2.0	0
RaB:								
Raisin---------------	0-5	3.0-11	---	5.6-7.3	0	0	0	0
	5-19	2.0-10	---	5.6-7.3	0	0	0	0
	19-25	18-27	---	5.6-7.3	0	0	0.0-1.0	0-2
	25-67	18-27	---	6.1-7.8	0-5	0	0.0-1.0	0-2
	67-80	17-27	---	7.4-8.4	5-45	0	0.0-1.0	0-2
RaC:								
Raisin---------------	0-9	3.0-11	---	5.6-7.3	0	0	0	0
	9-19	18-27	---	5.6-7.3	0	0	0.0-1.0	0-2
	19-38	18-27	---	6.1-7.8	0-5	0	0.0-1.0	0-2
	38-80	12-23	---	7.4-8.4	5-45	0	0.0-1.0	0-2
RaC2:								
Raisin---------------	0-4	6.0-16	---	5.6-7.3	0	0	0.0-0.2	0-1
	4-18	17-28	---	5.6-7.3	0	0	0.0-0.2	0-2
	18-80	17-26	---	7.4-8.4	5-20	0	0.0-2.0	0-4

Table 27.--Chemical Soil Properties--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
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
RnB:								
Raisin----------------	0-11	6.0-16	---	6.1-7.3	0	0	0.0-0.2	0-1
	11-20	17-28	---	6.1-7.3	0	0	0.0-0.2	0-2
	20-35	17-24	---	6.1-7.3	0	0	0.0-1.0	0-4
	35-80	17-24	---	7.4-8.4	5-20	0	0.0-2.0	0-4
RoA:								
Realitos-------------	0-6	30-45	---	6.1-7.8	0	0	0.0-1.0	0-2
	6-23	30-45	---	6.6-8.4	0	0	0.0-1.0	0-2
	23-75	30-45	---	6.6-8.4	2-10	0	0.0-1.0	0-6
	75-80	23-30	---	7.4-8.4	15-35	2-6	0.0-4.0	2-12
RsC:								
Rhymes---------------	0-10	1.0-5.0	---	5.6-7.3	0	0	0	0
	10-64	1.0-5.0	---	5.6-7.3	0	0	0	0
	64-80	8.0-25	---	5.6-7.8	0-5	0	0.0-2.0	0-4
RuB:								
Runge----------------	0-14	9.2-19	---	5.6-7.3	0	0	0	0
	14-51	15-27	---	6.1-7.3	0-10	0	0.0-0.2	0
	51-80	13-24	---	7.4-8.4	15-35	0	0	0
RyA:								
Rydolph--------------	0-9	25-35	---	7.9-8.4	10-25	0	0.0-2.0	10-20
	9-80	10-25	---	7.9-8.4	25-35	0	2.0-4.0	65-119
ScB:								
Sarco----------------	0-5	0.6-5.4	---	5.6-7.3	0	0	0	0
	5-12	0.5-5.4	---	5.6-7.3	0	0	0	0
	12-20	11-25	---	5.1-7.3	0	0	0.0-2.0	2-8
	20-32	---	6.3-12	5.1-7.3	0-1	0	0.0-3.0	6-13
	32-80	10-25	---	6.6-8.4	0-5	0	1.0-4.0	10-30
SnC:								
Sarnosa--------------	0-11	7.3-17	---	7.9-8.4	2-25	0	0.0-2.0	0
	11-37	7.1-19	---	7.9-8.4	10-40	0	0.0-2.0	0
	37-80	6.6-20	---	7.9-8.4	10-40	0	0.0-2.0	0
SnD:								
Sarnosa--------------	0-7	7.3-16	---	7.9-8.4	25-55	0	0	0
	7-29	7.1-16	---	7.9-8.4	35-75	0	0	0
	29-80	6.6-20	---	7.9-8.4	45-75	0	0	0
StC:								
Schattel-------------	0-13	21-34	---	7.4-8.4	2-15	0	0.0-2.0	0-4
	13-39	26-40	---	7.4-8.4	3-50	0-2	0.0-2.0	0-6
	39-52	25-42	---	7.4-8.4	0-30	0-5	2.0-6.0	4-12
	52-80	25-42	---	7.4-8.4	0-30	0-5	2.0-6.0	4-12
SwA:								
Sinton---------------	0-17	16-29	---	7.4-8.4	5-30	0	0	0
	17-41	17-29	---	7.4-8.4	5-30	0	0	0
	41-80	10-28	---	7.4-8.4	10-30	0	0	0
TeA:								
Telferner------------	0-9	7.4-15	---	6.1-7.3	0	0	0.0-2.0	0
	9-29	26-36	---	6.6-7.3	0-2	0	0.0-2.0	0-6
	29-80	15-29	---	7.4-8.4	0-10	0	0.0-2.0	0-8

Table 27.--Chemical Soil Properties--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
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
TeB:								
Telferner------------	0-12	3.0-7.0	---	6.1-7.3	0	0	0.0-2.0	0
	12-40	20-35	---	6.1-7.8	0-2	0	0.0-2.0	0
	40-80	15-30	---	7.4-8.4	0-10	0	0.0-2.0	0
ToA:								
Tiocano--------------	0-9	30-45	---	6.6-8.4	0	0	0	0
	9-34	29-44	---	6.6-8.4	0-15	0	0	0
	34-67	23-30	---	7.4-8.4	15-35	2-6	0.0-4.0	2-12
	67-80	6.2-14	---	7.4-8.4	10-30	0	0.0-2.0	0-4
UsB:								
Ustarents------------	0-6	15-35	---	6.6-8.4	0-5	0-2	0.0-2.0	0-2
	6-60	15-35	---	6.6-8.4	0-5	0-2	0.0-2.0	0-2
VdA:								
Vidauri--------------	0-4	4.3-12	---	5.1-6.5	0	0	0.0-1.0	0-2
	4-41	13-19	---	5.6-7.3	0	0	0.0-2.0	0-10
	41-49	10-18	---	7.4-8.4	0-5	0	0.2-4.0	4-12
	49-80	10-18	---	8.4-9.0	0-5	0	0.2-4.0	6-20
VwA:								
Vidauri--------------	0-4	4.3-12	---	5.1-6.5	0	0	0.0-1.0	0-2
	4-34	13-19	---	5.6-7.3	0	0	0.0-2.0	2-6
	34-80	10-18	---	7.4-8.4	0-5	0	0.2-2.0	4-12
Wyick----------------	0-9	2.2-9.7	---	5.1-7.3	0	0	0.0-2.0	0-4
	9-15	---	7.5-16	5.1-7.3	0	0	0.1-2.0	6-12
	15-34	10-25	---	6.1-7.3	0	0	0.1-2.0	6-12
	34-80	10-18	---	7.9-8.4	0-15	0	2.0-6.0	6-18
W:								
Water----------------	---	---	---	---	---	---	---	---
WcC:								
Weesatche------------	0-10	8.9-18	---	6.6-7.8	0	0	0	0
	10-50	16-28	---	7.4-8.4	0-10	0	0.0-0.2	0
	50-80	13-26	---	7.9-8.4	15-65	0-2	0.0-1.0	0-2
WeA:								
Weesatche------------	0-9	17-23	---	6.6-7.8	0	0	0.0-1.0	0-4
	9-27	16-28	---	7.4-8.4	0-2	0	0.0-1.0	0-4
	27-80	13-26	---	7.9-8.4	15-65	0	0.0-0.5	0-2
WeB:								
Weesatche------------	0-5	17-30	---	6.6-7.8	0-1	0	0	0
	5-28	16-35	---	7.4-8.4	0-1	0	0	0
	28-80	13-26	---	7.9-8.4	15-65	0	0.0-1.0	0-2
WeB2:								
Weesatche, eroded----	0-6	17-30	---	6.6-7.8	0-1	0	0	0
	6-25	16-35	---	7.4-8.4	0-1	0	0	0
	25-80	13-26	---	7.9-8.4	15-65	0	0.0-1.0	0-2
WeC:								
Weesatche------------	0-7	17-30	---	6.6-7.8	0-1	0	0	0
	7-33	16-35	---	7.4-8.4	0-1	0	0	0
	33-80	13-26	---	7.9-8.4	15-65	0	0.0-1.0	0-2

Table 27.--Chemical Soil Properties--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
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	dS/m	
WoA:								
Woodsboro------------	0-6	8.9-17	---	6.6-8.4	0	0	2.0-10.0	10-30
	6-32	25-33	---	7.4-9.0	0	0	5.0-15.0	15-40
	32-38	22-33	---	7.9-9.0	2-10	0-2	8.0-20.0	15-45
	38-80	16-33	---	7.9-9.0	5-20	0-2	8.0-20.0	15-45
WyA:								
Wyick----------------	0-6	2.2-9.7	---	5.1-6.5	0	0	0.0-2.0	0-4
	6-12	---	7.5-16	5.1-6.5	0	0	0.1-2.0	6-12
	12-30	10-25	---	6.1-7.8	0	0	0.1-2.0	6-12
	30-80	10-18	---	7.4-8.4	0-15	0	2.0-6.0	6-18
ZaA:								
Zalco----------------	0-10	0.0-6.4	---	6.6-8.4	5-25	0	0.0-2.0	0
	10-80	0.0-6.1	---	6.6-8.4	5-25	0	0.0-2.0	0
ZcA:								
Zalco----------------	0-6	0.0-6.4	---	6.6-8.4	5-25	0	0.0-2.0	0
	6-80	0.0-6.4	---	6.6-8.4	5-25	0	0.0-2.0	0
ZkA:								
Zunker---------------	0-12	6.2-14	---	7.9-8.4	10-30	0	0.0-2.0	0
	12-77	5.0-12	---	7.9-8.4	10-35	0	0.0-2.0	0
	77-80	9.2-18	---	7.9-8.4	5-25	0	0.0-2.0	0
ZnA:								
Zunker---------------	0-9	5.0-15	---	7.9-8.4	10-30	0	0.0-2.0	0
	9-26	5.0-20	---	7.9-8.4	10-35	0	0.0-2.0	0
	26-80	5.0-20	---	7.9-8.4	5-25	0	0.0-2.0	0

Table 28.--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	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
AnA:										
Ander	C	Medium	Jan-Dec	---	---	---	---	None	---	None
AnB:										
Ander	C	High	Jan-Dec	---	---	---	---	None	---	None
BnB:										
Blanconia	C/D	Low	Jan-Apr	0.8-2.0	1.0-2.5	---	---	None	---	None
			May-Dec	---	---	---	---	None	---	None
BsA:										
Buchel	D	Medium	Apr-Oct	---	---	---	---	None	Very brief	Occasional
BuA:										
Buchel	D	Low	Apr-Oct	---	---	---	---	None	Very brief	Frequent
CnA:										
Cieno	D	Negligible	Jan-Jun	0.0	>6.0	0.0-2.0	Very long	Frequent	---	None
			Jul-Aug	---	---	---	---	---	---	None
			Sep-Dec	0.0	>6.0	0.0-2.0	Very long	Frequent	---	None
CrA:										
Clareville	C	Negligible	Apr-Jun	---	---	---	---	None	---	Rare
			Sep-Oct	---	---	---	---	None	---	Rare
CrB:										
Clareville	C	Low	Apr-Jun	---	---	---	---	None	---	Rare
			Sep-Oct	---	---	---	---	None	---	Rare
CsC:										
Colibro	A	Very low	Jan-Dec	---	---	---	---	None	---	None
CsD:										
Colibro	A	Low	Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
CyB:										
Coy	D	Very high	Jan-Dec	---	---	---	---	None	---	None
CyC:										
Coy	D	Very high	Jan-Dec	---	---	---	---	None	---	None
DaA:										
Dacosta	D	High	Jan-Dec	---	---	---	---	None	---	None
DAMS:										
Dams	D	---	Jan-Dec	---	---	---	---	---	---	---
DcA:										
Dacosta	D	High	Jan-Dec	---	---	---	---	None	---	None
Contee	D	High	Jan-Apr	1.0-3.0	>6.0	---	---	None	---	None
			May-Aug	---	---	---	---	None	---	None
			Sep-Dec	1.0-3.0	>6.0	---	---	None	---	None
DeC:										
Devine	C	Low	Jan-Dec	---	---	---	---	None	---	None
DUMPS:										
Dumps, dumps	---	---	Jan-Dec	---	---	---	---	---	---	---
EbA:										
Edna	D	High	Jan-Jun	0.3-1.7	1.7-3.3	---	---	None	---	None
			Jul-Nov	---	---	---	---	None	---	None
			Dec	0.3-1.7	1.7-3.3	---	---	None	---	None
EdA:										
Edroy	D	Negligible	Jan-Jun	0.0	>6.0	0.0-2.0	Very long	Frequent	---	None
			Jul-Aug	---	---	---	---	---	---	None
			Sep-Dec	0.0	>6.0	0.0-2.0	Very long	Frequent	---	None
EnB:										
Elmendorf	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Denhawken	D	Very high	Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
FdA:										
Faddin	D	Low	Jan-Dec	---	---	---	---	None	---	None
GdB:										
Goliad	C	Medium	Jan-Dec	---	---	---	---	None	---	None
GoB:										
Goliad	C	Medium	Jan-Dec	---	---	---	---	None	---	None
GrA:										
Greta	C/D	High	Jan-Apr	0.3-0.7	0.7-2.0	---	---	None	---	None
			May-Sep	---	---	---	---	None	---	None
			Oct-Nov	0.3-0.7	0.7-2.0	---	---	None	---	None
			Dec	---	---	---	---	None	---	None
ImA:										
Imogene	D	High	Jan-Dec	---	---	---	---	None	---	None
InA:										
Inari	D	Medium	Jan-Dec	---	---	---	---	None	---	None
InB:										
Inari	D	High	Jan-Dec	---	---	---	---	None	---	None
KyB:										
Kuy	A	Negligible	Jan-May	4.0-6.0	4.5-6.0	---	---	None	---	None
			Jun-Nov	---	---	---	---	None	---	None
			Dec	4.0-6.0	4.5-6.0	---	---	None	---	None
LaA:										
Laewest	D	High	Jan-Dec	---	---	---	---	None	---	None
LaB:										
Laewest	D	Very high	Jan-Dec	---	---	---	---	None	---	None
LaD:										
Laewest, eroded	D	Very high	Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
LmB:										
Leming	C	Medium	Jan-Feb	---	---	---	---	None	---	None
			Mar-Apr	1.5-2.6	2.6-3.3	---	---	None	---	None
			May-Sep	---	---	---	---	None	---	None
			Oct-Dec	1.5-2.6	2.6-3.3	---	---	None	---	None
MbB:										
Milby	A	Very low	Jan-Feb	---	---	---	---	None	---	None
			Mar-May	1.5-2.5	2.0-3.3	---	---	None	---	None
			Jun-Dec	---	---	---	---	None	---	None
MeA:										
Meguin	B	Negligible	Apr-Oct	---	---	---	---	None	Brief	Occasional
MgA:										
Meguin	B	Negligible	Apr-Oct	---	---	---	---	None	Brief	Frequent
MoA:										
Monteola	D	High	Jan-Dec	---	---	---	---	None	---	None
MoB:										
Monteola	D	High	Jan-Dec	---	---	---	---	None	---	None
MoC:										
Monteola	D	Very high	Jan-Dec	---	---	---	---	None	---	None
NuC:										
Nusil	C	Medium	Jan-Dec	---	---	---	---	None	---	None
OdA:										
Odem	A	Negligible	Apr-Oct	---	---	---	---	None	---	Rare
Riverwash	---	Negligible	Jan-Apr	0.5-6.0	>6.0	---	---	None	---	---
			May-Oct	---	---	---	---	None	Brief	Frequent
			Nov-Dec	0.5-6.0	>6.0	---	---	None	---	---
OmD:										
Olmedo	D	High	Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
OrA:										
Orelia-------------------	D	High	Jan-Dec	---	---	---	---	None	---	None
PaB:										
Papalote-----------------	C	Low	Jan-Dec	---	---	---	---	None	---	None
PbA:										
Papalote-----------------	C	Medium	Jan-Dec	---	---	---	---	None	---	None
PbB:										
Papalote-----------------	C	High	Jan-Dec	---	---	---	---	None	---	None
PITS:										
Pits, borrow-------------	---	---	Jan-Dec	---	---	---	---	---	---	---
PrB:										
Parrita------------------	D	Medium	Jan-Dec	---	---	---	---	None	---	None
PtC:										
Pernitas-----------------	B	Low	Jan-Dec	---	---	---	---	None	---	None
PuC:										
Pettus-------------------	B	Low	Jan-Dec	---	---	---	---	None	---	None
RaB:										
Raisin-------------------	C	Low	Jan-Dec	---	---	---	---	None	---	None
RaC:										
Raisin-------------------	C	Low	Jan-Dec	---	---	---	---	None	---	None
RaC2:										
Raisin-------------------	C	Low	Jan-Dec	---	---	---	---	None	---	None
RnB:										
Raisin-------------------	C/D	Low	Jan-Dec	---	---	---	---	None	---	None
RoA:										
Realitos-----------------	D	Negligible	Jan-Apr	---	---	0.0-2.0	Very brief	Occasional	---	None
			May-Sep	---	---	0.0-2.0	Very brief	Occasional	---	None
			Oct-Dec	---	---	0.0-2.0	Very brief	Occasional	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
RsC:										
Rhymes	A	Negligible	Jan-Dec	---	---	---	---	None	---	None
RuB:										
Runge	B	Low	Jan-Dec	---	---	---	---	None	---	None
RyA:										
Rydolph	C	Negligible	Jan-Apr	2.0-5.0	>6.0	---	---	None	---	---
			May-Oct	---	---	---	---	None	Brief	Frequent
			Nov-Dec	2.0-5.0	>6.0	---	---	None	---	---
ScB:										
Sarco	C/D	Medium	Jan-Feb	---	---	---	---	None	---	None
			Mar-Apr	0.8-1.6	1.6-2.5	---	---	None	---	None
			May-Sep	---	---	---	---	None	---	None
			Oct-Nov	0.8-1.6	1.6-2.5	---	---	None	---	None
SnC:										
Sarnosa	B	Low	Jan-Dec	---	---	---	---	None	---	None
SnD:										
Sarnosa	B	High	Jan-Dec	---	---	---	---	None	---	None
StC:										
Schattel	C	Very high	Jan-Dec	---	---	---	---	None	---	None
SwA:										
Sinton	B	Negligible	Apr-Oct	---	---	---	---	None	Brief	Occasional
TeA:										
Telferner	D	High	Jan	0.8-1.0	1.7-1.7	---	---	None	---	None
			Feb	0.8-1.0	1.7-1.7	---	---	None	---	None
			Mar-Nov	---	---	---	---	None	---	None
			Dec	0.8-1.0	1.7-1.7	---	---	None	---	None
TeB:										
Telferner	D	Very high	Jan	0.8-1.0	1.7-1.7	---	---	None	---	None
			Feb	0.8-1.0	1.7-1.7	---	---	None	---	None
			Mar-Nov	---	---	---	---	None	---	None
			Dec	0.8-1.0	1.7-1.7	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
ToA:										
Tiocano	D	Negligible	Jan-May	0.0	>6.0	0.0-1.0	Long	Occasional	---	None
			Jun-Aug	---	---	---	---	---	---	None
			Sep-Dec	0.0	>6.0	0.0-1.0	Long	Occasional	---	None
UsB:										
Ustarents	B	Medium	Jan-Dec	---	---	---	---	None	---	None
VdA:										
Vidauri	D	Negligible	Jan-Apr	0.3-1.5	1.0-2.0	0.0-0.2	Brief	Occasional	---	None
			May-Aug	---	---	---	---	---	---	None
			Sep-Dec	0.5-1.5	1.0-2.0	---	---	---	---	None
VwA:										
Vidauri	D	Negligible	Jan-Apr	0.3-1.5	1.0-2.0	0.0-0.2	Brief	Occasional	---	None
			May-Aug	---	---	---	---	---	---	None
			Sep-Dec	0.5-1.5	1.0-2.0	---	---	---	---	None
Wyick	D	High	Jan-Apr	0.4-1.0	1.0-2.5	---	---	None	---	None
			May-Aug	---	---	---	---	None	---	None
			Sep-Dec	0.5-1.0	1.0-1.5	---	---	None	---	None
W:										
Water	---	---	Jan-Dec	---	---	---	---	---	---	---
WcC:										
Weesatche	B	Low	Jan-Dec	---	---	---	---	None	---	None
WeA:										
Weesatche	B	Negligible	Jan-Dec	---	---	---	---	None	---	None
WeB:										
Weesatche	B	Low	Jan-Dec	---	---	---	---	None	---	None
WeB2:										
Weesatche, eroded	B	Low	Jan-Dec	---	---	---	---	None	---	None
WeC:										
Weesatche	B	Low	Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft	Ft	Ft				
WoA:										
Woodsboro	D	High	April	0.0	0.5-3.3	---	---	None	---	Rare
			May	0.0	0.5-3.3	---	---	None	---	Rare
			June	0.0	0.5-3.3	---	---	None	---	Rare
			September	0.0	0.5-3.3	---	---	None	---	Rare
			October	0.0	0.5-3.3	---	---	None	---	Rare
WyA:										
Wyick	D	High	Jan-Apr	0.4-1.0	1.0-2.5	---	---	None	---	None
			May-Aug	---	---	---	---	None	---	None
			Sep-Dec	0.5-1.0	1.0-1.5	---	---	None	---	None
ZaA:										
Zalco	A	Negligible	Apr-Oct	---	---	---	---	None	Brief	Occasional
ZcA:										
Zalco	A	Negligible	Apr-Oct	---	---	---	---	None	Brief	Frequent
ZkA:										
Zunker	A	Negligible	Apr-Oct	---	---	---	---	None	Brief	Occasional
ZnA:										
Zunker	A	Negligible	Apr-Oct	---	---	---	---	None	Brief	Frequent

Table 29.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
AnA:						
Ander	Abrupt textural change	7-16	---	---	High	Low
AnB:						
Ander	Abrupt textural change	7-16	---	---	High	Low
BnB:						
Blanconia	Abrupt textural change	9-19	---	---	High	Low
BsA:						
Buchel	---	---	---	---	High	Low
BuA:						
Buchel	---	---	---	---	High	Low
CnA:						
Cieno	---	---	---	---	High	Low
CrA:						
Clareville	---	---	---	---	High	Low
CrB:						
Clareville	---	---	---	---	High	Low
CsC:						
Colibro	---	---	---	---	Moderate	Low
CsD:						
Colibro	---	---	---	---	Moderate	Low
CyB:						
Coy	---	---	---	---	High	Low
CyC:						
Coy	---	---	---	---	High	Low
DaA:						
Dacosta	---	---	---	---	High	Low
DAMS:						
Dams	---	---	---	---	Moderate	---
DcA:						
Dacosta	---	---	---	---	High	Low
Contee	---	---	---	---	High	Low
DeC:						
Devine	Abrupt textural change	6-18	---	---	Moderate	Low
DUMPS:						
Dumps, dumps	---	---	---	---	Moderate	---

Table 29.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
EbA:						
Edna	Abrupt textural change	4-10	---	---	High	Low
EdA:						
Edroy	---	---	---	---	High	Low
EnB:						
Elmendorf	---	---	---	---	High	Low
Denhawken	---	---	---	---	High	Low
FdA:						
Faddin	Abrupt textural change	8-20	---	---	High	Low
GdB:						
Goliad	Cemented horizon	25-40	---	Weakly cemented	High	Low
GoB:						
Goliad	Petrocalcic	22-49	---	Strongly cemented	High	Low
	Petrocalcic	37-80	---	Weakly cemented		
GrA:						
Greta	Natric	4-20	---	---	High	Low
	Abrupt textural change	4-7	---	---		
ImA:						
Imogene	Natric	2-10	---	---	High	Moderate
InA:						
Inari	Abrupt textural change	8-20	---	---	High	Low
InB:						
Inari	Abrupt textural change	8-20	---	---	High	Low
KyB:						
Kuy	---	---	---	---	High	Moderate
LaA:						
Laewest	---	---	---	---	High	Low
LaB:						
Laewest	---	---	---	---	High	Low
LaD:						
Laewest, eroded	---	---	---	---	High	Low
LmB:						
Leming	Abrupt textural change	20-34	---	---	High	Low
MbB:						
Milby	Abrupt textural change	22-35	---	---	Low	Moderate
MeA:						
Meguin	---	---	---	---	High	Low

Table 29.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Depth to top	Thickness	Hardness	Risk of corrosion: Uncoated steel	Concrete
		In	In			
MgA:						
Meguin	---	---	---	---	High	Low
MoA:						
Monteola	---	---	---	---	High	Low
MoB:						
Monteola	---	---	---	---	High	Low
MoC:						
Monteola	---	---	---	---	High	Low
NuC:						
Nusil	Abrupt textural change	22-35	---	---	Low	Moderate
OdA:						
Odem	---	---	---	---	Moderate	Low
Riverwash	---	---	---	---	High	Low
OmD:						
Olmedo	Petrocalcic	10-20	---	Strongly cemented	High	Low
OrA:						
Orelia	---	---	---	---	High	Low
PaB:						
Papalote	Abrupt textural change	6-18	---	---	High	Low
PbA:						
Papalote	Abrupt textural change	6-18	---	---	High	Low
PbB:						
Papalote	Abrupt textural change	6-18	---	---	High	Low
PITS:						
Pits, borrow	---	---	---	---	Moderate	---
PrB:						
Parrita	Petrocalcic	14-20	---	Strongly cemented	High	Low
PtC:						
Pernitas	---	---	---	---	High	Low
PuC:						
Pettus	---	---	---	---	Moderate	Low
RaB:						
Raisin	Abrupt textural change	8-20	---	---	High	Low
RaC:						
Raisin	Abrupt textural change	6-18	---	---	High	Low
RaC2:						
Raisin	Abrupt textural change	2-6	---	---	Moderate	Low

Table 29.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
RnB:						
Raisin	Abrupt textural change	9-18	---	---	High	Low
RoA:						
Realitos	---	---	---	---	High	Low
RsC:						
Rhymes	---	---	---	---	Low	Low
RuB:						
Runge	---	---	---	---	Moderate	Low
RyA:						
Rydolph	---	---	---	---	High	Low
ScB:						
Sarco	Abrupt textural change	10-14	---	---	High	Low
SnC:						
Sarnosa	---	---	---	---	Moderate	Low
SnD:						
Sarnosa	---	---	---	---	Low	Low
StC:						
Schattel	---	---	---	---	High	Low
SwA:						
Sinton	---	---	---	---	Moderate	Low
TeA:						
Telferner	Abrupt textural change	6-29	---	---	High	Low
TeB:						
Telferner	Abrupt textural change	6-29	---	---	High	Low
ToA:						
Tiocano	---	---	---	---	High	Low
UsB:						
Ustarents	---	---	---	---	High	Low
VdA:						
Vidauri	Abrupt textural change	3-7	---	---	High	Low
VwA:						
Vidauri	Abrupt textural change	3-7	---	---	High	Low
Wyick	Abrupt textural change	7-12	---	---	High	Low
W:						
Water	---	---	---	---	Moderate	---
WcC:						
Weesatche	Abrupt textural change	8-12	---	---	High	Low
WeA:						
Weesatche	---	---	---	---	High	Low

Table 29.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
WeB:						
Weesatche	---	---	---	---	High	Low
WeB2:						
Weesatche, eroded	---	---	---	---	High	Low
WeC:						
Weesatche	---	---	---	---	High	Low
WoA:						
Woodsboro	Natric	3-9	---	---	High	Moderate
WyA:						
Wyick	Abrupt textural change	4-8	---	---	High	Low
ZaA:						
Zalco	---	---	---	---	High	Low
ZcA:						
Zalco	---	---	---	---	High	Low
ZkA:						
Zunker	---	---	---	---	Moderate	Low
ZnA:						
Zunker	---	---	---	---	Moderate	Low

Table 30.--Physical Analysis of Selected Soils

(The abbreviation “COLE” means coefficient of linear extensibility. Dashes indicate that data were not available. Analyses performed at USDA NRCS, National Soil Survey Laboratory, Lincoln, Nebraska.)

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2.0-0.05 mm)	Fine Silt (0.02-0.002 mm)	Total Silt	Fine Clay <0.0002 mm	Total Clay	COLE	Bulk Density: 1/3-bar	Oven Dry	Water Content: 1/3-bar	15-bar
	In		(by weight)										cm/cm	g/cc	g/cc	Wt %	Wt %
Ander (1,2)																	
S07-TX175-002																	
07N02015	0-6	A1	0.4	2.9	15.1	38.6	17.0	74.0	7.5	14.4	8.4	11.6	0.009	1.55	1.59	11.7	6.2
07N02016	6-12	A2	0.3	4.5	16.4	40.5	12.0	73.7	7.9	14.7	7.9	11.6	0.006	1.70	1.73	9.9	5.5
07N02017	12-17	Bt1	0.6	2.7	10.8	24.7	9.4	48.2	5.1	6.7	40.2	45.1	0.128	1.33	1.91	31.7	22.2
07N02018	17-28	Bt2	0.6	3.6	11.5	24.8	10.0	50.5	5.6	8.9	34.5	40.6	0.086	1.49	1.91	25.3	22.3
07N02019	28-38	Bt3	1.2	3.6	12.4	26.5	11.4	55.1	5.6	9.5	29.9	35.4	0.051	1.56	1.81	21.6	18.0
07N02020	38-45	Btk1	1.0	5.3	14.3	31.9	9.5	62.0	6.2	9.7	18.5	28.3	0.033	1.58	1.74	18.4	14.0
07N02021	45-59	Btk2	1.6	4.2	13.0	29.8	11.6	60.2	6.0	11.0	19.8	28.8	0.047	1.55	1.78	22.6	13.5
07N02022	59-72	B't4	1.6	4.4	10.9	23.3	10.7	50.9	11.5	17.0	21.9	32.1	0.039	1.56	1.75	20.3	15.6
07N02023	72-80	Bk	0.9	2.2	6.6	13.3	6.0	29.0	43.2	47.3	14.6	23.7	0.028	1.50	1.63	22.6	11.0
Faddin (1,3)																	
S03-TX175-001																	
04N01049	0-11	A	tr	1.1	11.5	46.4	20.9	79.9	5.9	14.2	3.6	5.9	0.011	1.53	1.58	11.1	4.0
04N01050	11-18	Bt1	tr	0.8	7.6	27.3	14.0	49.7	5.3	10.7	34.4	39.6	0.103	1.37	1.84	30.3	18.1
04N01051	18-26	Bt2	0.1	0.9	9.8	27.6	15.4	53.8	6.1	14.9	25.6	31.3	0.066	1.62	1.96	19.7	14.4
04N01052	26-36	Bt3	tr	0.9	10.8	34.9	14.5	61.1	6.4	13.7	21.0	25.2	0.059	1.66	1.97	19.3	11.3
04N01053	36-52	Btk1	0.1	1.1	8.5	33.0	13.0	55.7	9.3	16.9	17.5	27.4	0.055	1.61	1.89	20.1	12.0
04N01054	52-72	Btk2	0.1	0.9	8.7	31.7	15.3	56.7	9.0	17.1	17.9	26.2	0.058	1.56	1.85	21.2	11.3
04N01055	72-80	Btk3	0.1	1.1	11.3	28.9	14.7	56.1	7.9	14.9	19.8	29.0	0.057	1.55	1.83	22.3	13.3
Greta (1,2)																	
S01-TX175-003																	
01N05453	0-5	A	---	0.8	8.2	39.8	23.0	71.8	8.2	17.4	6.4	10.8	0.015	1.70	1.78	10.9	4.5
01N05454	5-13	Btn1	0.1	0.7	7.8	33.4	14.3	56.3	6.0	12.4	25.4	31.3	0.075	1.53	1.90	23.5	13.2
01N05455	13-25	Btn2	tr	0.8	10.2	34.4	15.5	60.9	7.3	14.4	19.4	24.7	0.042	1.73	1.96	16.6	10.5
01N05456	25-34	Btn3	0.3	1.1	7.9	33.4	17.3	60.0	7.9	14.4	16.6	25.6	0.049	1.61	1.86	19.9	11.0
01N05457	34-49	Btk1	0.1	1.1	6.6	29.2	17.3	54.3	12.4	19.4	15.0	26.3	0.059	1.60	1.90	21.2	11.0
01N05458	49-67	Btk2	0.1	0.8	7.6	32.2	15.2	55.9	10.8	17.9	16.1	26.2	0.054	1.62	1.90	19.7	10.7
01N05459	67-80	Btk3	0.3	0.7	6.9	29.6	14.8	52.3	12.8	20.8	16.5	26.9	0.055	1.61	1.89	19.9	10.9

Table 30.--Physical Analysis of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Sand: Coarse (1.0-0.5mm)	Sand: Medium (0.5-0.25mm)	Sand: Fine (0.25-0.1 mm)	Sand: Very fine (0.1-0.05 mm)	Sand: Total (2.0-0.05 mm)	Fine Silt (0.02-0.002 mm)	Total Silt	Fine Clay <0.0002 mm	Total Clay	COLE	Bulk Density: 1/3-bar	Bulk Density: Oven Dry	Water Content: 1/3-bar	Water Content: 15-bar
	In		(by weight)										cm/cm	g/cc	g/cc	Wt %	Wt %
Raisin (1,4)																	
S07-TX175-005																	
08N01102	0-5	A	0.1	3.2	28.2	35.6	9.3	76.4	7.4	18.3	3.5	5.3	0.004	1.74	1.76	8.8	3.3
08N01103	5-16	E	0.2	3.3	27.6	38.8	7.9	77.8	6.7	17.4	3.8	4.8	0.006	1.72	1.75	5.7	2.3
08N01104	16-24	Bt1	0.1	3.6	20.8	25.8	6.5	56.8	3.7	11.3	30.0	31.9	0.072	1.37	1.69	27.5	16.1
08N01105	24-32	Bt2	0.3	2.1	18.2	28.2	7.5	56.3	4.7	13.3	26.7	30.4	0.065	1.44	1.74	24.3	14.9
08N01106	32-41	Bt3	0.7	2.1	19.1	26.7	5.2	53.8	4.2	10.4	27.7	35.8	0.073	1.54	1.90	22.6	16.0
08N01107	41-52	Bt4	0.2	2.2	27.1	33.1	3.2	65.8	4.1	8.6	22.1	25.6	0.037	1.75	1.95	16.5	12.9
08N01108	52-64	Bt5	0.3	1.9	29.7	32.7	4.1	68.7	3.8	9.8	18.1	21.5	0.031	1.77	1.94	15.2	10.8
08N01100	64-78	Bt6	1.2	9.2	43.9	28.3	1.5	84.1	2.1	4.4	11.4	11.5	0.020	1.67	1.77	11.6	7.2
08N01110	78-80	Bt7	0.6	6.7	48.4	26.4	1.6	85.7	0.8	3.3	9.4	11.0	0.014	1.65	1.72	9.3	5.5
Raisin (1,2)																	
S07-TX175-006																	
08N01111	0-5	A	tr	3.3	22.8	52.6	8.5	87.2	2.7	9.4	2.9	3.4	0.004	1.56	1.58	6.1	2.7
08N01112	5-19	E	0.1	3.1	21.0	50.5	11.2	85.9	2.9	10.2	2.5	3.9	0.004	1.61	1.63	3.6	1.8
08N01113	19-25	Bt1	0.1	2.4	14.0	31.0	7.6	55.1	4.8	11.3	29.4	33.6	0.111	1.30	1.79	32.1	16.9
08N01114	25-35	Bt2	0.2	2.3	15.2	33.7	9.4	60.8	4.9	13.0	22.5	26.2	0.056	1.64	1.93	20.0	12.9
08N01115	35-46	Bt3	0.1	1.4	13.2	35.8	11.6	62.1	4.3	12.5	22.2	25.4	0.053	1.68	1.96	19.1	12.7
08N01116	46-54	Bt4	tr	1.6	13.4	37.0	11.4	63.4	4.8	13.8	20.4	22.8	0.049	1.69	1.95	18.8	12.1
08N01117	54-67	Bt5	0.2	1.9	12.4	35.7	8.5	58.7	5.7	16.1	22.4	25.2	0.050	1.65	1.91	20.4	12.8
08N01118	67-80	Btk	0.9	2.8	7.8	15.4	6.1	33.0	30.2	40.4	17.3	26.6	0.066	1.17	1.53	36.4	13.9
Vidauri (1,2)																	
S01-TX175-002																	
01N05445	0-4	A	---	0.6	7.5	35.1	18.9	62.1	9.1	16.1	9.1	21.8	0.025	1.59	1.71	10.5	9.5
01N05446	4-9	Bt1	tr	0.7	9.2	37.6	16.9	64.4	8.1	15.6	8.1	20.0	0.046	1.54	1.76	14.2	7.5
01N05447	9-19	Bt2	tr	tr	0.3	6.4	28.7	35.4	10.1	33.0	10.1	31.6	0.065	1.68	2.03	17.7	12.8
01N05448	19-32	Bt3	---	0.6	7.4	31.2	16.4	55.6	7.0	13.7	7.0	30.7	0.047	1.68	1.93	16.6	11.9
01N05449	32-41	Bt4	0.1	0.7	6.6	32.7	16.0	56.1	6.2	13.6	6.2	30.3	0.044	1.57	1.79	19.7	10.9
01N05450	41-49	Btk	0.1	0.6	7.2	34.7	13.5	56.1	6.0	11.9	6.0	32.0	0.050	1.64	1.90	18.1	10.8
01N05451	49-59	Btkn1	0.1	0.5	6.8	32.1	13.8	53.3	6.1	11.2	6.1	35.5	0.079	1.59	2.00	22.1	14.4
01N05452	59-80	Btkn2	0.2	0.8	6.4	32.7	16.3	56.4	5.3	9.5	5.3	34.1	0.080	1.60	2.03	23.1	13.0

Table 30.--Physical Analysis of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2.0-0.05 mm)	Fine Silt (0.02-0.002 mm)	Total Silt	Fine Clay <0.0002 mm	Total Clay	COLE	Bulk Density: 1/3-bar	Oven Dry	Water Content: 1/3-bar	15-bar
	In		(by weight)										cm/cm	g/cc	g/cc	Wt %	Wt %
Weesatche (1,2)																	
S07-TX175-003																	
07N02024	0-5	A	0.3	2.2	11.9	28.1	9.8	52.3	8.7	18.8	24.6	28.9	0.046	1.39	1.59	23.7	15.0
07N02025	5-12	Bt1	0.9	2.6	9.8	24.3	11.0	48.6	8.0	17.1	30.1	34.3	0.046	1.37	1.57	22.0	17.2
07N02026	12-27	Bt2	2.6	2.5	8.3	22.5	10.9	46.8	8.0	17.5	29.4	35.7	0.047	1.55	1.78	20.4	16.1
07N02027	27-37	Btk	2.4	3.0	7.0	18.8	10.0	41.2	13.3	22.5	20.0	36.3	0.044	1.59	1.81	18.7	14.9
07N02028	37-61	Bk1	0.9	1.9	3.1	7.3	5.6	18.8	43.1	60.1	13.4	21.1	0.008	1.36	1.40	21.1	9.3
07N02029	61-80	Bk2	0.5	2.0	4.0	10.4	7.4	24.3	31.4	46.7	21.8	29.0	0.037	1.36	1.54	26.7	13.9
Wyick (1,5)																	
S01-TX175-001																	
01N05436	0-6	A	0.1	3.0	19.7	41.1	13.8	77.7	4.8	14.6	4.3	7.7	0.008	1.69	1.73	06.9	3.2
01N05437	6-12	Bt1	0.1	2.7	15.4	29.9	11.2	59.3	3.3	12.3	23.7	28.4	0.044	1.54	1.75	16.5	12.4
01N05438	12-18	Bt2	0.3	3.2	14.5	32.0	11.8	61.8	5.7	11.3	21.4	26.9	0.063	1.68	2.02	17.9	10.9
01N05439	18-30	Bt3	0.4	3.7	14.0	30.3	12.8	61.2	7.0	12.6	18.7	26.2	0.067	1.62	1.97	20.1	11.2
01N05440	30-39	Btk1	0.4	3.5	13.1	30.5	12.9	60.4	6.7	11.7	16.0	27.9	0.053	1.49	1.74	23.2	11.8
01N05441	39-49	Btk2	---	3.2	12.9	30.6	13.9	60.6	6.6	11.7	17.6	27.7	0.060	1.56	1.86	21.9	11.2
01N05442	49-59	Btk3	0.2	2.1	13.9	31.8	12.0	60.0	6.5	12.9	18.0	27.1	0.061	1.60	1.91	20.6	11.1
01N05443	59-69	Btky	0.2	2.3	14.4	29.7	11.6	58.2	6.9	12.0	18.1	29.8	0.060	1.61	1.92	20.4	12.0
01N05444	69-80	Bky	0.5	2.7	13.2	28.6	11.5	56.5	7.8	12.8	17.4	30.7	0.072	1.59	1.96	22.6	12.4
Wyick (1,2)																	
S03-TX175-002																	
04N01056	0-6	A	0.1	0.7	10.1	42.6	22.1	75.6	8.5	18.5	3.5	5.9	0.011	1.50	1.55	15.3	3.0
04N01057	6-12	Bt1	---	0.6	5.4	24.7	14.7	45.4	5.0	12.3	36.8	42.3	0.095	1.40	1.84	31.7	20.0
04N01058	12-21	Bt2	tr	0.6	6.6	28.7	18.1	54.0	5.6	14.3	25.3	31.7	0.061	1.53	1.83	22.2	14.1
04N01059	21-30	Bt3	tr	0.6	9.3	31.9	20.6	62.4	6.8	15.0	17.0	22.6	0.056	1.58	1.86	20.0	10.3
04N01060	30-57	Btk1	0.4	0.7	6.1	28.3	16.2	51.7	11.8	20.7	15.4	27.6	0.054	1.57	1.84	20.9	12.0
04N01061	57-74	Btk2	0.6	1.0	5.5	23.6	16.2	46.9	17.0	26.8	14.9	26.3	0.058	1.55	1.84	22.7	12.1
04N01062	74-80	Btk3	0.2	0.5	4.3	22.3	16.9	44.2	19.5	29.2	14.8	26.6	0.072	1.51	1.86	24.0	12.6

Footnotes

1 National Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska.

2 Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

3 From the Refugio and Goliad County line marker on Texas Highway 239, 1.0 mile west on Texas Highway 239 to gate on south side of road, 7.0 miles south and southwest on ranch road to double windmills, 0.9 mile northwest and west on ranch road, and 0.2 mile northwest in rangeland.

4 From the intersection of FM 1961 and FM 622, 1.2 miles west on FM 1961 to Hencerling Road, 1.2 miles east and north on Hencerling Road to private ranch road, 0.5 mile west, 0.5 mile north, 0.2 mile west on ranch road, and 250 feet north in pastureland.

5 From the intersection of U.S. Highway 183 and FM 2441, 12.6 miles west and south on FM 2441 to private ranch road, 3.8 miles east on private ranch road to windmill, 0.2 mile southeast on ranch road to fenceline, 0.25 mile east along fenceline, and 0.1 mile north in rangeland.

Table 31.--Chemical Analysis of Selected Soils

(Dashes indicate that analyses were not made. Analyses performed at USDA-NRCS, National Soil Survey Laboratory, Lincoln, Nebraska.)

Soil name and sample number	Depth	Horizon	pH 1:1 (soil: water)	Extractable bases				Total Acid-ity	Cation Exchange Capacity (CEC7)	Base satura-tion (NH_4OAC)	Exchange-able sodium (ESP)	Electrical Conductivity	Carbonate as $CaCO_3$	Ratio CEC to Clay
				Ca	Mg	Na	K							
	In		pH	---------------- Meq/100gm ------------						Pct	Pct	dS/m	Pct	
Ander (1,2)														
S07-TX175-002														
07N02015	0-7	A1	6.4	8.4	1.4	---	0.4	3.5	10.9	94	---	---	tr	0.94
07N02016	7-12	A2	6.9	7.3*	1.1	0.1	0.2	2.2	8.7	100	1	---	tr	0.75
07N02017	12-17	Bt1	7.0	25.0	5.5	1.9	0.6	7.5	34.7	95	5	---	tr	0.77
07N02018	17-28	Bt2	7.5	22.3	5.5	2.6	0.6	4.2	31.7	98	8	---	tr	0.78
07N02019	28-38	Bt3	8.0	19.8	5.2	3.6	0.4	2.8	30.0	97	12	---	tr	0.85
07N02020	38-45	Btk1	7.9	32.2*	4.3	3.9	0.4	tr	22.7	100	17	---	1	0.80
07N02021	45-59	Btk2	7.8	22.4*	4.3	4.3	0.5	0.9	22.9	100	19	---	1	0.80
07N02022	59-72	B't4	7.9	46.6*	4.8	4.3	0.5	---	17.4	100	25	---	9	0.54
07N02023	72-80	Bk	8.0	48.4*	3.1	2.4	0.3	---	12.2	100	20	---	48	0.51
Faddin (1,3)														
S03-TX175-001														
04N01049	0-11	A	6.4	4.0*	1.1	0.3	0.4	---	5.8	100	5	0.48	---	0.98
04N01050	11-18	Bt1	6.2	16.2	7.9	0.2	0.5	---	27.0	92	1	0.12	---	0.68
04N01051	18-26	Bt2	6.8	14.9*	6.8	0.2	0.4	---	21.2	100	1	0.46	---	0.68
04N01052	26-36	Bt3	6.7	11.6	5.3	0.1	0.5	---	18.3	96	tr	0.21	---	0.73
04N01053	36-52	Btk1	8.1	43.5*	6.7	0.2	0.4	---	19.4	100	1	0.31	3	0.71
04N01054	52-72	Btk2	8.2	42.0*	7.0	0.2	0.4	---	18.5	100	1	0.29	3	0.71
04N01055	72-80	Btk3	8.2	28.1*	8.7	0.3	0.5	---	21.4	100	1	0.31	1	0.74
Greta (1,2)														
S01-TX175-003														
01N05453	0-5	A	6.9	4.9*	1.3	0.4	0.2	1.6	6.5	100	5	0.54	---	0.60
01N05454	5-13	Btn1	6.7	10.2	4.5	2.1	0.3	4.2	19.5	88	9	0.62	---	0.62
01N05455	13-25	Btn2	7.4	9.4*	4.8	3.8	0.2	0.6	16.4	100	16	2.68	tr	0.66
01N05456	25-34	Btn3	8.1	16.4*	5.4	5.0	0.2	---	16.7	100	21	3.60	1	0.65
01N05457	34-49	Btk1	8.1	46.8*	5.4	5.2	0.3	---	16.3	100	20	4.63	9	0.62
01N05458	49-67	Btk2	8.2	46.1*	5.4	5.0	0.3	---	16.7	100	19	4.82	7	0.64
01N05459	67-80	Btk3	8.0	46.9*	5.2	4.9	0.3	---	16.9	100	19	4.20	9	0.63

Table 31.--Chemical Analysis of Selected Soils–Continued

Soil name and sample number	Depth	Horizon	pH 1:1 (soil: water)	Extractable bases Ca	Mg	Na	K	Total Acid-ity	Cation Exchange Capacity (CEC7)	Base satura-tion (NH_4OAC)	Exchange-able sodium (ESP)	Electrical Conductivity	Carbonate as $CaCO_3$	Ratio CEC to Clay
	In		pH	------ Meq/100gm					------	Pct	Pct	dS/m	Pct	
Raisin (1,4)														
S07-TX175-005														
08N01102	0-5	A	5.0	1.7	0.6	---	0.3	4.9	4.0	65	---	---	---	0.75
08N01103	5-16	E	5.1	1.3	0.4	---	0.2	3.3	3.2	59	---	---	---	0.67
08N01104	16-24	Bt1	5.3	12.4	5.5	tr	0.7	9.2	21.2	88	tr	---	---	0.66
08N01105	24-32	Bt2	5.4	11.5	6.2	0.1	0.4	8.0	20.6	88	tr	---	---	0.68
08N01106	32-41	Bt3	5.6	14.0	7.8	0.2	0.4	6.8	23.4	96	1	---	---	0.65
08N01107	41-52	Bt4	6.1	11.2	6.1	0.4	0.4	5.7	18.6	97	2	---	---	0.73
08N01108	52-64	Bt5	6.3	10.8	5.7	0.5	0.3	3.1	17.0	100	3	---	---	0.79
08N01100	64-78	Bt6	6.5	6.3	3.3	0.4	0.2	2.2	10.1	100	4	---	---	0.88
08N01110	78-80	Bt7	6.5	5.4	2.7	0.4	0.3	1.7	8.7	100	5	---	tr	0.79
Raisin (1,2)														
S07-TX175-006														
08N01111	0-5	A	6.2	1.9	0.4	---	0.2	1.8	3.3	76	---	---	tr	0.97
08N01112	5-19	E	6.3	1.6	0.3	---	tr	1.0	2.5	76	---	---	---	0.64
08N01113	19-25	Bt1	6.3	15.5	4.4	0.1	0.4	6.3	21.6	94	tr	---	---	0.64
08N01114	25-35	Bt2	6.3	13.6	4.3	0.1	0.2	4.5	18.8	97	1	---	tr	0.72
08N01115	35-46	Bt3	6.4	14.4	4.1	0.2	0.2	4.4	20.6	92	1	---	---	0.81
08N01116	46-54	Bt4	6.6	14.2	3.7	0.2	0.2	2.3	20.3	90	1	---	---	0.89
08N01117	54-67	Bt5	6.9	16.1	3.4	0.2	0.3	2.2	18.3	100	1	---	---	0.73
08N01118	67-80	Btk	8.1	52.2	3.0	0.2	0.3	---	19.9	100	1	---	36	0.75
Vidauri (1,2)														
S01-TX175-002														
01N05445	0-4	A	5.6	6.0	2.8	0.3	0.3	5.4	12.1	78	2	0.42	---	0.56
01N05446	4-9	Bt1	5.7	5.1	2.5	0.3	0.2	3.3	9.3	87	3	0.25	---	0.47
01N05447	9-19	Bt2	6.2	7.3	4.2	0.6	0.3	3.4	14.9	83	4	0.22	---	0.47
01N05448	19-32	Bt3	6.8	7.7	4.5	0.9	0.3	1.7	13.7	98	6	0.35	---	0.45
01N05449	32-41	Bt4	7.5	7.5*	4.6	1.3	0.3	1.4	13.7	100	9	0.23	---	0.45
01N05450	41-49	Btk	8.5	12.5*	4.7	1.6	0.3	0.3	14.1	100	11	0.38	tr	0.44
01N05451	49-59	Btkn1	8.3	11.6*	5.4	2.6	0.3	0.6	15.9	100	15	0.41	1	0.42
01N05452	59-80	Btkn2	8.5	17.6*	5.0	3.1	0.4	0.2	14.2	100	20	0.42	1	
Weesatche (1,2)														
S07-TX175-003														
07N02024	0-5	A	7.5	27.7*	1.9	---	0.9	---	29.9	100	---	---	tr	1.03
07N02025	5-12	Bt1	7.6	28.3	1.9	tr	0.6	3.2	31.4	98	tr	---	tr	0.92
07N02026	12-27	Bt2	7.8	30.3*	2.1	tr	0.5	2.9	31.4	100	tr	---	tr	0.88
07N02027	27-37	Btk	8.1	47.8*	2.2	tr	0.5	---	26.3	100	tr	---	13	0.72
07N02028	37-61	Bk1	8.1	45.1*	1.5	---	0.3	---	12.8	100	---	---	64	0.61
07N02029	61-80	Bk2	8.2	45.6*	3.3	0.1	0.5	---	15.6	100	tr	---	41	0.54

Table 31.--Chemical Analysis of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	pH 1:1 (soil: water)	Extractable bases				Total Acid-ity	Cation Exchange Capacity (CEC7)	Base satura-tion (NH_4OAC)	Exchange-able sodium (ESP)	Electrical Conductivity	Carbonate as $CaCO_3$	Ratio CEC to Clay
				Ca	Mg	Na	K							
	In		pH	---------- Meq/100gm ----------						Pct	Pct	dS/m	Pct	
Wyick (1,5)														
S01-TX175-001														
01N05436	0-6	A	5.2	2.2	1.2	0.3	0.2	2.5	4.5	87	6	0.96	---	0.58
01N05437	6-12	Bt1	5.7	8.4	5.0	1.9	0.2	4.9	17.3	90	10	0.48	---	0.61
01N05438	12-18	Bt2	6.5	8.1	5.0	2.3	0.2	2.2	16.0	98	13	0.28	---	0.59
01N05439	18-30	Bt3	8.1	13.5*	5.7	3.8	0.2	0.9	17.3	100	19	1.43	1	0.66
01N05440	30-39	Btk1	8.1	16.9*	6.5	5.2	0.2	---	19.3	100	17	4.08	1	0.69
01N05441	39-49	Btk2	8.1	10.4*	6.4	5.4	0.3	0.9	18.6	100	19	4.64	tr	0.67
01N05442	49-59	Btk3	8.0	11.0*	6.2	5.2	0.3	0.6	17.7	100	19	4.98	tr	0.65
01N05443	59-69	Btky	7.9	15.5*	6.4	5.5	0.3	---	18.6	100	17	6.18	1	0.62
01N05444	69-80	Bky	8.0	26.7*	6.1	4.9	0.2	---	17.1	100	17	5.67	2	0.56
Wyick (1,2)														
S03-TX175-002														
04N01056	0-6	A	5.9	2.2	0.7	---	0.3	---	3.7	86	---	0.38	---	0.63
04N01057	6-12	Bt1	6.4	14.0	9.0	2.1	0.4	---	28.3	90	7	0.27	---	0.67
04N01058	12-21	Bt2	6.7	10.4	6.6	1.5	0.4	---	20.1	94	7	0.31	---	0.63
04N01059	21-30	Bt3	7.5	8.2*	5.2	1.7	0.3	---	15.4	100	10	0.62	---	0.68
04N01060	30-57	Btk1	8.1	42.8*	7.0	3.9	0.4	---	16.3	100	15	4.21	9	0.59
04N01061	57-74	Btk2	8.3	43.0*	7.6	4.2	0.4	---	17.6	100	15	4.26	13	0.67
04N01062	74-80	Btk3	8.2	43.1*	7.1	4.0	0.4	---	17.8	100	15	3.71	14	0.67

Footnotes

* Extractable Ca may contain Ca from calcium carbonate or gypsum; CEC7 base saturation set to 100.

1 National Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska.

2 Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

3 From the Refugio and Goliad County line marker on Texas Highway 239, 1.0 mile west on Texas Highway 239 to gate on south side of road, 7.0 miles south and southwest on ranch road to double windmills, 0.9 mile northwest and west on ranch road, and 0.2 mile northwest in rangeland.

4 From the intersection of FM 1961 and FM 622, 1.2 miles west on FM 1961 to Hencerling Road, 1.2 miles east and north on Hencerling Road to private ranch road, 0.5 mile west, 0.5 mile north, 0.2 mile west on ranch road, and 250 feet north in pastureland.

5 From the intersection of U.S. Highway 183 and FM 2441, 12.6 miles west and south on FM 2441 to private ranch road, 3.8 miles east on private ranch road to windmill, 0.2 mile southeast on ranch road to fenceline, 0.25 mile east along fenceline, and 0.1 mile north in rangeland.

Table 32.--Clay Mineralogy of Selected Soils

(Analysis by National Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska. Relatvie Peak Size; 5-Very large; 4-Large; 3-Medium; 2-Small; 1-Very small. Dashes indicate that none of the mineral was detected)

Soil name and sample number	Depth	Horizon	Percentage of clay minerals (1)					
			Montmorillonite	Mica	Kaolinite	Quartz	Calcite	Lepidocrocite
	In							
Ander (2)								
S07-TX175-002								
07N02015	0-7	A1	3	2	2	1	---	---
07N02017	12-17	Bt1	3	2	2	1	---	---
07N02019	28-38	Bt3	3	2	2	2	---	---
07N02022	59-72	B't4	3	2	2	1	1	---
Raisin (3)								
S07-TX175-005								
08N01102	0-5	A	---	1	2	2	---	---
08N01104	16-24	Bt1	---	---	1	1	---	---
08N01106	32-41	Bt3	1	---	3	1	---	1
08N01108	52-64	Bt5	3	---	2	---	---	---
08N01110	78-80	Bt7	4	---	3	1	---	---
Raisin (2)								
S07-TX175-006								
08N01111	0-5	A	3	---	2	1	---	---
08N01113	19-25	Bt1	3	2	2	---	---	---
08N01115	35-46	Bt3	3	2	2	---	---	---
08N01118	67-80	Btk	3	2	2	---	---	---
Weesatche (2)								
S07-TX175-003								
07N02024	0-5	A	3	2	2	1	---	---
07N02025	5-12	Bt1	3	1	1	1	---	---
07N02026	12-27	Bt2	3	1	2	1	---	---
07N02029	61-80	Bk2	3	2	1	---	---	---

Footnotes

1 Total clay fraction.

2 Location of pedon sampled is the same as the pedon given as typical for the series in the section "Soil Series and Their Morphology."

3 From the intersection of FM 1961 and FM 622, 1.2 miles west on FM 1961 to Hencerling Road, 1.2 miles east and north on Hencerling Road to private ranch road, 0.5 mile west, 0.5 mile north, 0.2 mile west on ranch road, and 250 feet north in pastureland.

Table 33.--Taxonomic Classification of the Soils

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

Soil name	Family or higher taxonomic class
Ander	Fine, smectitic, hyperthermic Udic Paleustolls
Blanconia	Fine, smectitic, hyperthermic Oxyaquic Paleustalfs
Buchel	Fine, smectitic, hyperthermic Typic Haplusterts
Cieno	Fine-loamy, siliceous, active, hyperthermic Typic Vermaqualfs
Clareville	Fine, smectitic, hyperthermic Pachic Argiustolls
Colibro	Fine-loamy, carbonatic, hyperthermic Typic Calciustepts
Contee	Fine, smectitic, hyperthermic Chromic Hapluderts
Coy	Fine, smectitic, hyperthermic Pachic Vertic Argiustolls
Dacosta	Fine, smectitic, hyperthermic Vertic Argiudolls
Denhawken	Fine, smectitic, hyperthermic Vertic Haplustepts
Devine	Clayey-skeletal, mixed, active, hyperthermic Typic Paleustalfs
Edna	Fine, smectitic, hyperthermic Aquertic Chromic Hapludalfs
Edroy	Fine, smectitic, hyperthermic Ustic Epiaquerts
Elmendorf	Fine, smectitic, hyperthermic Pachic Vertic Argiustolls
Faddin	Fine, smectitic, hyperthermic Oxyaquic Vertic Argiudolls
Goliad	Fine, smectitic, hyperthermic Petrocalcic Paleustolls
Greta	Fine-loamy, mixed, superactive, hyperthermic Aquic Natrustalfs
Imogene	Fine-loamy, mixed, superactive, hyperthermic Mollic Natrustalfs
Inari	Fine-loamy, mixed, superactive, hyperthermic Oxyaquic Argiustolls
Kuy	Loamy, siliceous, active, hyperthermic Grossarenic Paleudalfs
Laewest	Fine, smectitic, hyperthermic Typic Hapluderts
Leming	Clayey, mixed, active, hyperthermic Arenic Paleustalfs
Meguin	Fine-silty, mixed, superactive, hyperthermic Fluventic Haplustolls
Milby	Loamy, siliceous, active, hyperthermic Arenic Paleudalfs
Monteola	Fine, smectitic, hyperthermic Typic Haplusterts
Nusil	Loamy, siliceous, active, hyperthermic Arenic Paleustalfs
Odem	Coarse-loamy, mixed, superactive, hyperthermic Cumulic Haplustolls
Olmedo	Loamy-skeletal, carbonatic, hyperthermic, shallow Petrocalcic Calciustolls
Orelia	Fine-loamy, mixed, superactive, hyperthermic Typic Argiustolls
Papalote	Fine, smectitic, hyperthermic Typic Paleustalfs
Parrita	Loamy, mixed, superactive, hyperthermic, shallow Petrocalcic Paleustolls
Pernitas	Fine-loamy, mixed, superactive, hyperthermic Typic Argiustolls
Pettus	Loamy-skeletal, carbonatic, hyperthermic Typic Calciustolls
Raisin	Fine-loamy, mixed, superactive, hyperthermic Typic Haplustalfs
Realitos	Fine, smectitic, hyperthermic Typic Haplusterts
Rhymes	Loamy, siliceous, active, hyperthermic Grossarenic Paleustalfs
Runge	Fine-loamy, mixed, superactive, hyperthermic Typic Argiustolls
Rydolph	Fine-silty, mixed, active, calcareous, hyperthermic Aeric Fluvaquents
Sarco	Fine-loamy, siliceous, superactive, hyperthermic Oxyaquic Haplustalfs
Sarnosa	Coarse-loamy, mixed, superactive, hyperthermic Typic Calciustolls
Schattel	Fine, smectitic, hyperthermic Vertic Calciustepts
Sinton	Fine-loamy, mixed, superactive, hyperthermic Cumulic Haplustolls
Telferner	Fine, smectitic, hyperthermic Oxyaquic Vertic Hapludalfs
Tiocano	Fine, smectitic, hyperthermic Udic Haplusterts
Ustarents	Ustarents
Vidauri	Fine-loamy, mixed, active, hyperthermic Aquic Haplustalfs
Weesatche	Fine-loamy, mixed, superactive, hyperthermic Typic Argiustolls
Woodsboro	Fine, smectitic, hyperthermic Typic Natraqualfs
Wyick	Fine-loamy, mixed, superactive, hyperthermic Oxyaquic Haplustalfs
Zalco	Sandy, siliceous, hyperthermic Typic Udifluvents
Zunker	Coarse-loamy, siliceous, superactive, hyperthermic Fluventic Haplustepts

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