United States Department of Agriculture

In cooperation with Texas AgriLife Research

Natural Resources Conservation Service

Soil Survey of Presidio 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.

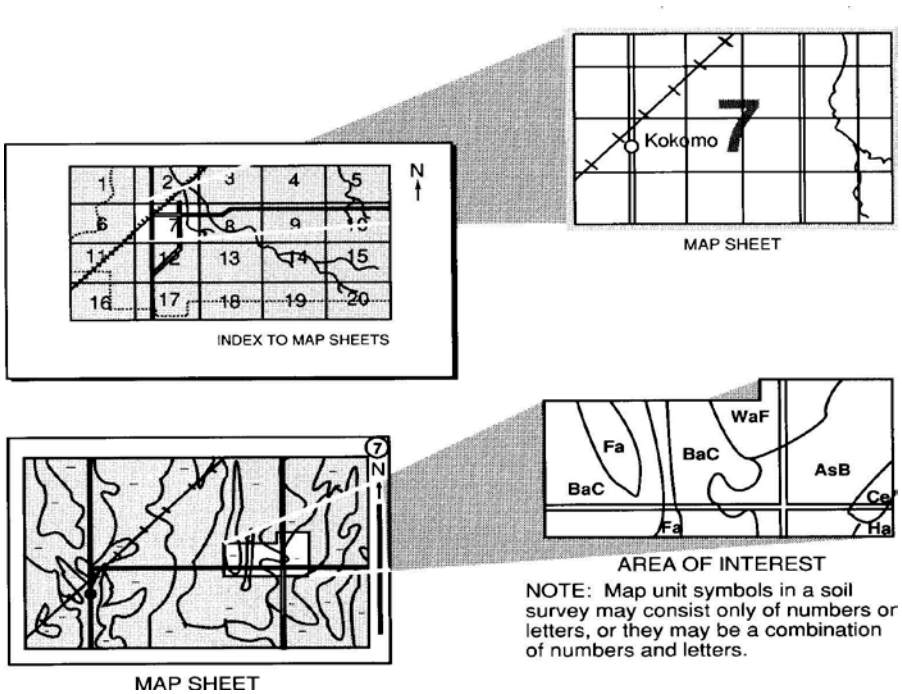
Detailed Soil Maps

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.



National Cooperative Survey

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 2010. Soil names and descriptions were approved in 2012. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2010. 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 Highland 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.

Citation

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Cover Caption

Chinati Peak in Presidio County, Texas. In the foreground are fan remnants of the map units, COC—Corazones-Ojinaga complex, 1 to 12 percent slopes and COE—Corazones-Ojinaga complex, 10 to 40 percent slopes.

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2013

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

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

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Soil Survey of Presidio County, Texas

By Ramiro Molina, Natural Resources Conservation Service

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United States Department of Agriculture, Natural Resources Conservation Service,
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Presidio County is in the Trans-Pecos region of southwest Texas in the Southern Desertic Basins, Plains, and Mountains Major Land Resource Area (fig.1). It is triangular in shape and bound on the north by Jeff Davis County, on the east by Brewster County, and on the south and west by the Rio Grande and Mexico.

The total area of Presidio County is 3,858 square miles or 2,469,273 acres. Marfa, the county seat, and Presidio are the major towns in Presidio County. Other towns include Redford, Candelaria, Ruidoso, and Shafter. The population of the county in 2000 was 7,470.

Elevation ranges from 2,518 to 7,728 feet above sea level. The topography of the county ranges from undulating to rolling plains in the northern part known as the Marfa Plateau to some of the highest and most rugged mountains in Texas in the central, far western, and southeastern parts.

The major drainage system of Presidio County is the Rio Grande and the creeks and arroyos that flow into it. Alamito Creek, Capote Creek, Cibolo Creek, Cienega, Pinto Canyon, and Terneros Creek are some of the major drains within the county. They all flow in a southerly direction toward the Rio Grande.

The major land use in Presidio County is wildlife habitat, livestock grazing, and recreation. The economy of the county is based primarily on large-scale cattle ranching, hunting leases, vegetable farming, and the art and tourism industry. Big Bend Ranch State Park in the southeastern part of the county, and the town of Marfa are popular tourist destinations as well as nearby Big Bend National Park in Brewster County and Fort Davis National Historic Site in Jeff Davis County.

General Nature of the Survey Area

This section provides general information about Presidio County. It describes the history, natural resources, and climate of the county.

History

The area around the present town of Presidio on the Rio Grande is thought to be the oldest continuously cultivated farmland in Texas. The area has been farmed since about 1500 B.C. The first farmers were of the Cochise culture and settled there because of the abundant water, fertile soil, and bountiful wildlife. The area was known as La Junta de los Rios, or the Junction of the Rivers, because the Rio Grande and the Rio Conchos join at

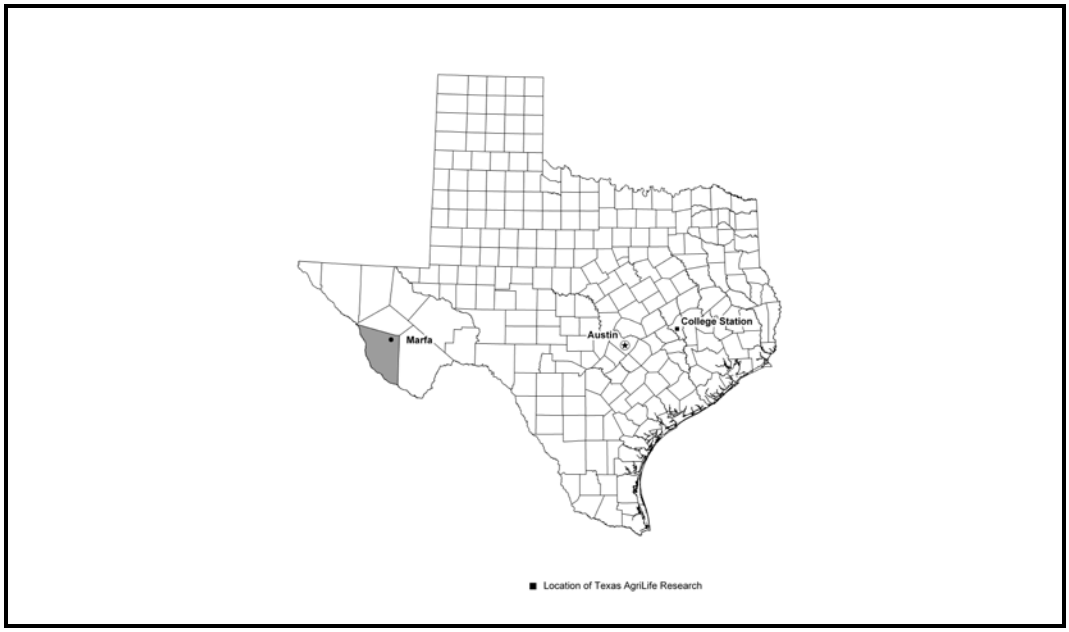

Figure 1.—Location of Presidio County, Texas. College Station is headquarters of Texas AgriLife Research. Austin is the capital of Texas.

the site. By the time the Spaniards arrived in 1535, there were two main native tribes that lived in pueblos and grew crops of corn, beans, squash, pumpkins, and melons. The Spaniards eventually established seven missions at seven pueblos in the La Junta area.

In January 1832, Lt. Col. Jose Ygnacio Ronquillo and his family established a settlement in an area along Cibolo Creek, three miles north of the site of Presidio. The settlement, called El Cibolo, included Ronquillos' soldiers and laborers. The settlement was abandoned in November 1832 when the soldiers were called away to fight Indians.

In 1839 the Chihuahua Trail opened as a trade route from Chihuahua City, Mexico, through Presidio County to the Red River on to Independence, Missouri. After Texas joined the Union in 1846, the economic potential of the area was recognized by the Americans. By 1848, Ben Leaton built Fort Leaton on the Rio Grande, which served as his residence as well as a trading post and private fortress.

The first large-scale rancher to move away from the Rio Grande was Milton Faver. He built two private forts, Fort Cibolo and Fort Cienega for protection of his family, workers, and livestock.

In 1850, the county was established and Fort Leaton was named as the county seat. Fort Davis was built in what was then northern Presidio County in 1854 to protect against Indian raids. The fort was shut down during the Civil War but was reopened in 1867. Presidio County was organized in 1875 as the largest county in the U.S. encompassing 12,000 square miles. Fort Davis was named the county seat.

In 1880, silver was discovered in the Chinati Mountains by John W. Spencer. The discovery brought about the opening of the Presidio Mine and the establishment of the company town of Shafter. The mine produced over 32.6 million ounces of silver from 1883 to 1942.

In 1882, the Galveston, Harrisburg and San Antonio Railroad laid tracks in the northeastern corner of the county. The railroad was used to transport livestock to market, from the large ranches in the county. The first barbed wire fence was built by W.F. Mitchell in 1888 at Antelope Springs. Windmills, water wells, and earthen tanks were constructed on these ranches in the late 1880's to provide water for livestock.

The county boundaries and the county seat changed during the 1880's. The town of Marfa was established in 1883 and became the county seat in 1885. Fort Davis became

the seat of Jeff Davis County, which was formed from former Presidio County lands. Other counties, including Brewster were carved out of Presidio, reducing Presidio County to its present size as the fourth largest county in the state.

By 1890 there were 40 farms in the county producing hay vegetables, and peaches, as well as small grains. But agriculture changed after 1914 when, with the completion of Elephant Butte Dam upstream on the Rio Grande, the cultivation of irrigated cotton began. By 1939 the county had over 1,000 cotton farms. Cattle ranching operations also changed over the years, with more sheep than cattle recorded in the county in the 1880 census. The distribution changed so that by the 1940 census cattle outnumbered sheep.

The early American settlers in the southern part of the county first sent their children to Austin and San Antonio for schooling. The first public school in the county was established at Fort Davis in 1883. Between 1885 and 1902 public schools were built at Marfa, Polvo, Presidio, Shafter, Ruidosa, and Candelaria.

Population of the county grew in the 1910's, a reflection of the impact of the Mexican Revolution on border life with refugees migrating north from Chihuahua to escape the fighting in northern Mexico. During this time the U.S. Army established several posts and in 1917 established Camp Marfa, later Fort D. A. Russell, to protect the border area.

In 1930 the Kansas City, Mexico and Orient Railway of Texas reached Presidio where a bridge was built across the Rio Grande to provide connections into Mexico. In the early 1930's the population of the county declined as a result of the Great Depression and drought.

After the Depression and during World War II there was an increase in population. Two military installations, Fort Russell and Marfa Army Air Field were operating in the county during this time. After the war, the population of the county declined; however, since the 1980's population has steadily increased. (Smith, 2010)

Natural Resources

The most important natural resources in Presidio County are soil, water, wildlife, and the scenic landscapes found throughout the county.

Sand, gravel, and caliche are mined and are used in construction and roadways. Zeolite is also mined in the county and, because of their absorptive properties, can be used in a variety of commercial applications. (Jacob, 1984)

The Rio Grande and underground aquifers are the primary sources of water in the county. Rangeland in the county produces forage for both livestock and wildlife. The grass and brush cover on rangeland help protect the soil from water and wind erosion. Management practices that increase the amount of vegetative cover on the ground surface also increase the rate of water infiltration, thus reducing runoff and soil erosion. These practices result in better use of rainfall, higher forage production, reduced flooding in low lying areas, and improved water quality.

Climate

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

Climate tables are created from climate stations Candelaria, Marfa, and Presidio, Texas. Additional information for the narrative, below, was derived from new USDA-NRCS precipitation and temperature maps produced using the PRISM modeling system at Oregon State University.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order stations El Paso and Midland, Texas.

Table 1, Table 4, and Table 7 provide data on temperature and precipitation for the survey area as recorded at Candelaria, Marfa, and Presidio in the period 1971 to 2000. Table 2, Table 5, and Table 8 show probable dates of the first freeze in fall and the last

freeze in spring. Table 3, Table 6, and Table 9 provide data on the length of the growing season.

In winter, average temperatures are 51, 45 and 54 degrees F, respectively, at Candelaria, Marfa, and Presidio. Average daily minimum temperatures in winter are 33, 27 and 36 degrees F, respectively. The lowest temperatures on record were: 6 degrees at Candelaria on December 23, 1989; -2 degrees at Marfa on January 5, 1972; and 4 degrees at Presidio, on January 12, 1962. In summer, average temperatures are 83, 74, and 87 degrees F, respectively, at Candelaria, Marfa, and Presidio. Average daily maximum temperatures in summer are 99, 90, and 101 degrees F, respectively. The highest temperatures ever recorded were: 115 degrees at Candelaria on June 28, 1998; 106 degrees at Marfa on June 27, 1994; and 117 degrees at Presidio on June 18, 1960.

Growing degree days are shown in Table 1, Table 4, and Table 7. 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.

Average annual total precipitation across the county ranges from 11 inches along the Rio Grande near Presidio and Lajitas, to about 13 inches upstream at Candelaria, to between 14 and 18 inches across the rest of the county, including 14.82 inches at a climate station 10 miles WSW of Valentine, Texas. At the three climate stations, Candelaria, Marfa, and Presidio, normal annual precipitation are 13, 16, and 11 inches, respectively. Of these amounts, about 80 to 90 percent usually falls during the growing season, which is from April through October across much of the county, but from March to November along the Rio Grande. The heaviest 1-day rainfalls during the periods of record were: 2.77 inches at Candelaria on September 12, 1975; 2.93 inches at Marfa on May 16, 1984; and 3.01 inches at Presidio on September 26, 1958. Thunderstorms occur on about 36 days each year, and most occur in July and August.

Average seasonal snowfall is quite meager across the county, ranging from near zero along the Rio Grande to approximately 5 to 10 inches over the highest terrain. At Candelaria and Presidio the annual average is about 0.1 inch. At Marfa the seasonal normal is 2 inches, and 5 inches is normal at Valentine 10, at an elevation of 4,400 feet. The greatest snow depth at any one time during the periods of record was: 3 inches at Candelaria on February 3, 1956; 4 inches at Marfa on January 12, 1985; and 3 inches at Presidio, on December 1, 1931. On average, less than 1 day each year has at least 1 inch of snow on the ground over most of the county, although the higher mountains have a little snow cover for a few days each winter. The heaviest 1-day snowfalls on record were: 3.0 inches at Candelaria on February 3, 1956; 4.0 inches at Marfa on January 1, 1983; and 6.8 inches at Presidio, recorded on December 1, 1931.

The average relative humidity in mid-afternoon is about 25 percent. Humidity is higher at night, and the average at dawn is about 57 percent. The sun shines 81 percent of the time in summer and 75 percent in winter. The prevailing wind is from the south, but significant terrain-induced winds exist across this mountainous terrain. Average wind speed is highest, around 11 miles per hour, in March and 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 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.

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.

Figure 2, Figure 3, Figure 4, Figure 5, Figure 6. Figure 7, Figure 8, Figure 9, Figure 10, and Figure 11 depict areas of the general soil map units.

1. Musquiz-Murray-Marfa

Very deep, well drained, loamy to clayey, and gravelly soils

This map unit makes up about 19 percent of the survey area. It is about 28 percent Musquiz soils, 26 percent Murray soils, 24 percent Marfa soils, and 22 percent other soils.

Musquiz soils occur on fan piedmonts and alluvial flats on 0 to 5 percent slopes. They are very deep soils that are slowly permeable. Typically, the surface layer is brown clay loam about 7 inches thick. The upper part of the subsoil from 7 to 35 inches is reddish brown clay. The lower part of the subsoil from 35 to 80 inches is yellowish red clay loam.

Murray soils occur on fan piedmonts on 1 to 5 percent slopes. They are very deep soils that are moderately permeable. Typically the surface layer is brown fine sandy loam about 9 inches thick. The upper part of the subsoil from 9 to 25 inches is light brown loam. The middle part of the subsoil from 25 to 47 inches is pink sandy clay loam. The lower part of the subsoil from 47 to 80 inches is pink sandy loam.

Marfa soils occur on drainageways on 0 to 2 percent slopes. They are very deep soils that are moderately slowly permeable. Typically, the surface layer is dark grayish brown clay loam about 4 inches thick. The upper part of the subsoil from 4 to 24 inches is dark grayish brown clay loam and clay. The middle part of the subsoil from 24 to 41 inches is brown clay. The lower part of the subsoil from 41 to 80 inches is light brown sandy clay loam.

Of minor extent are areas of Boracho and Berrend soils which occur on fan piedmonts and Phantom soils which occur on alluvial flats and drainageways.

2. Brewster-Rock outcrop

Very shallow to very shallow; well drained, loamy, very gravelly to very cobbly soils, and areas of exposed igneous bedrock

This map unit makes up about 15 percent of the survey area. It is about 55 percent Brewster soils, 15 percent Rock outcrop, and 30 percent other soils.

Brewster soils are on hills and mountains on 1 to 60 percent slopes. They are very shallow to very shallow soils that are moderately slowly permeable over igneous bedrock. Typically, the surface layer is brown very cobbly loam about 4 inches thick. The subsurface layer from 4 to 11 inches is brown very cobbly clay loam. The underlying material from 11 to 20 inches is indurated trachyte bedrock.

Rock outcrop are areas of exposed igneous bedrock on the summits, shoulders, and backslopes of hills and mountains. These areas include almost vertical escarpments and ledges.

Of minor extent are areas of Costavar, Mainstay, Pardo, and Volco soils which occur on hills. Also, areas of Sanmoss and Medley soils occur on lower footslopes and drainageways.

3. Corazones-Ojinaga-Redford

Very shallow to very deep, well drained, loamy and gravelly soils

This map unit makes up about 11 percent of the survey area. It is about 50 percent Corazones soils, 27 percent Ojinaga soils, 15 percent Redford soils, and 8 percent other soils.

Corazones soils occur on fan remnants and ballenas on 1 to 50 percent slopes. They are very deep soils that are moderately rapidly permeable. Typically, the surface layer is pale brown gravelly sandy loam about 2 inches thick. The subsoil from 2 to 25 inches is pale brown very gravelly sandy loam and extremely gravelly sandy loam. The underlying material from 25 to 80 inches is pale brown extremely gravelly fine sand.

Ojinaga soils occur on fan remnants on 1 to 30 percent slopes. They are very shallow to very shallow soils that are moderately rapidly permeable over a very slowly permeable petrocalcic horizon. Typically, the surface layer is brown very gravelly loam about 6 inches thick. The upper subsoil from 6 to 12 inches is pale brown very gravelly loam and extremely gravelly loam. The middle subsoil from 12 to 22 inches is a white strongly cemented petrocalcic horizon. The lower subsoil from 22 to 69 inches is light gray extremely gravelly loamy coarse sand and extremely gravelly sandy loam. The underlying material from 69 to 80 inches is brown extremely gravelly coarse sand.

Redford soils occur on fan remnants and ballenas on 10 to 70 percent slopes. They are very shallow to very shallow soils that are moderately rapidly permeable over fanglomerate bedrock. Typically, the surface layer is very pale brown very gravelly sandy loam about 3 inches thick. The subsoil from 3 to 14 inches is light yellowish brown very gravelly sandy loam. The underlying material from 14 to 24 inches is strongly cemented fanglomerate bedrock.

Of minor extent are areas of Baviza and Pantera soils and Riverwash, which occur on the floor of active arroyos. These areas will flood during rainfall events. Rushing water and debris will destroy any existing vegetation. Texture and gravel content is variable depending on the watershed area contributing to the sediments.

4. Manzanillo-Chilicotal-Paisano

Very shallow to very deep, well drained, loamy and gravelly soils

This map unit makes up about 10 percent of the survey area. It is about 30 percent Manzanillo soils, 16 percent Chilicotal soils, 15 percent Paisano soils, and 39 percent other soils.

Manzanillo soils occur on fan remnants and ballenas on 1 to 30 percent slopes. They are very shallow to very shallow soils that are moderately permeable over a petrocalcic horizon on top of fanglomerate bedrock. Typically, the surface layer is brown gravelly sandy loam about 2 inches thick. The upper part of the subsoil from 2 to 13 inches is brown extremely gravelly sandy clay loam. The lower part of the subsoil from 13 to 16 inches is a white moderately cemented petrocalcic horizon. The underlying material from 16 to 22 inches is strongly cemented fanglomerate bedrock.

Chilicotal soils occur on fan remnants and piedmonts on 1 to 30 percent slopes. They are very deep soils that are moderately permeable. Typically the surface layer is brown very gravelly fine sandy loam about 2 inches thick. The upper part of the subsoil from 2 to 40 inches is brown very gravelly loam. The lower part of the subsoil from 40 to 80 inches is pink extremely gravelly sandy loam.

Paisano soils occur on fan remnants, pediments, and ballenas on 1 to 20 percent slopes. They are very shallow to very shallow soils that are moderately rapidly permeable over a very slowly permeable petrocalcic horizon. Typically, the surface layer is pale brown very gravelly fine sandy loam about 3 inches thick. The upper part of the subsoil from 3 to 8 inches is light yellowish brown very gravelly loam. The middle part of the subsoil from 8 to 28 inches is a white, indurated and strongly cemented petrocalcic horizon. The lower part of the subsoil from 28 to 80 inches is white very gravelly sandy loam.

Of minor extent are areas of Altar soils which occur on flood plain steps, Nolam soils which occur on fan remnants, Holguin and Musgrave soils which occur on pediments, Bodecker soils which occur on flood plains, and Straddlebug and Gemelo soils which occur on lower footslopes.

5. Chinati-Boracho-Chilimol-Berrend

Very shallow to very shallow, well drained, loamy, gravelly to very gravelly soils

This map unit makes up about 9 percent of the survey area. It is about 31 percent Chinati soils, 23 percent Boracho soils, 12 percent Chilimol soils, 10 percent Berrend soils, and 24 percent other soils.

Chinati soils occur on fan remnants and ballenas on 1 to 20 percent slopes. They are very shallow to very shallow soils that are moderately permeable over a petrocalcic horizon on top of fanglomerate bedrock. Typically, the surface layer is grayish brown very gravelly loam about 3 inches thick. The upper part of the subsoil from 3 to 12 inches is dark brown very gravelly loam. The lower part of the subsoil from 12 to 21 inches is a white moderately cemented petrocalcic horizon. The underlying material from 21 to 40 inches is strongly cemented fanglomerate bedrock.

Boracho soils occur on fan remnants and ballenas on 1 to 16 percent slopes. They are very shallow to very shallow soils that are moderately permeable over a very slowly permeable petrocalcic horizon. Typically, the surface layer is dark brown very gravelly sandy clay loam about 7 inches thick. The upper part of the subsoil from 7 to 14 inches is brown extremely gravelly sandy clay loam. The middle part of the subsoil from 14 to 19 inches is a white strongly cemented petrocalcic horizon. The lower part of the subsoil from 19 to 42 inches is pale brown extremely gravelly sandy clay loam.

Chilimol soils occur on fan remnants on 1 to 8 percent slopes. They are very deep soils that are moderately permeable. Typically the surface layer is brown very gravelly loam about 10 inches thick. The upper part of the subsoil from 10 to 22 inches is brown very gravelly loam. The middle part of the subsoil from 22 to 48 inches is light brown very gravelly loam. The lower part of the subsoil from 48 to 65 inches is pink very gravelly loam.

Berrend soils occur on piedmont slopes and fan remnants on 1 to 8 percent slopes. They are very deep soils that are moderately permeable. Typically, the surface layer is brown sandy clay loam about 2 inches thick. The upper part of the subsoils from 2 to 13 inches is brown sandy clay loam. The middle part of the subsoils from 13 to 38 inches is brown clay loam. The next part of the subsoil from 38 to 60 inches is light brown loam. The lower part of the subsoil from 60 to 80 inches is pink fine sandy loam.

Of minor extent are areas of Espy and Eppenauer soils which occur on fan piedmonts and fan remnants, Sanmoss soils which occur on alluvial fans and terraces, and Rockhouse soils which occur on drainageways.

6. Pantak-Lingua-Bofecillos-Horsetrap-Rock outcrop

Very shallow to very shallow, well drained, loamy and gravelly soils, and areas of exposed igneous bedrock

This map unit makes up about 9 percent of the survey area. It is about 25 percent Pantak soils, 16 percent Lingua soils, 16 percent Bofecillos soils, 12 percent Horsetrap soils, 18 percent Rock outcrop, and 13 percent other soils.

Pantak soils occur on hills and mountains on 1 to 30 percent slopes. They are very shallow to very shallow soils that are moderately permeable over igneous bedrock. Typically the surface layer is brown very gravelly sandy clay loam about 3 inches thick. The subsoil from 3 to 8 inches is brown extremely gravelly sandy clay loam. The underlying material from 8 to 20 inches is indurated, trachyte bedrock.

Lingua soils occur on hills, mountains, and escarpments on 1 to 45 percent slopes. They are very shallow to very shallow soils that are moderately permeable over igneous bedrock. Typically the surface layer is brown very gravelly sandy clay loam about 8 inches thick. The underlying material from 8 to 20 inches is indurated igneous bedrock.

Bofecillos soils occur on hills and mountains on 1 to 50 percent slopes. They are very shallow to very shallow soils that are moderately slowly permeable over igneous bedrock. Typically the surface layer is brown very gravelly sandy clay loam about 4 inches thick. The underlying material from 4 to 14 inches is indurated basalt bedrock.

Horsetrap soils occur on hills and mountains on 1 to 30 percent slopes. They are very shallow to very shallow soils that are moderately slowly permeable over igneous bedrock. Typically the surface layer is grayish brown gravelly sandy clay loam about 4 inches thick. The subsoil from 4 to 13 inches is grayish brown very gravelly clay loam. The underlying material from 13 to 23 inches is indurated basalt bedrock.

Rock outcrop are areas of exposed bedrock on the summit, shoulder, and backslopes of hills and mountains, or as escarpments and ledges.

Of minor extent are small areas of Ohtwo soils which occur on talus slopes.

7. Scotal-Sauceda-Holguin-Ohtwo-Rock outcrop

Very shallow to very shallow, well drained, loamy and gravelly soils, and areas of exposed igneous bedrock

This map unit makes up about 6 percent of the survey area. It is about 24 percent Scotal soils, 16 percent Sauceda soils, 14 percent Holguin soils, 14 percent Ohtwo soils, 12 percent Rock outcrop, and 20 percent other soils.

Scotal soils occur on hills, cuestas, and escarpments on 1 to 60 percent slopes. They are very shallow to very shallow soils that are moderately permeable over tuffaceous bedrock. Typically the surface layer is brown very gravelly sandy clay loam about 3 inches thick. The subsoil from 3 to 8 inches is yellowish brown very gravelly sandy clay loam. The underlying material from 8 to 20 inches is strongly cemented tuff bedrock.

Sauceda soils occur on cuestas and hills on 1 to 20 percent slopes. They are very shallow to very shallow soils that are moderately permeable over igneous bedrock. Typically the surface layer is brown very gravelly loam about 2 inches thick. The subsoil from 2 to 8 inches is brown very cobbly loam. The underlying material from 8 to 20 inches is indurated ignimbrite bedrock.

Holguin soils occur on hills and cuestas on 1 to 8 percent slopes. They are very shallow to very shallow soils that are moderately rapidly permeable over conglomerate and tuffaceous bedrock. Typically the surface layer is brown very gravelly sandy loam about 9 inches thick. The subsurface layer from 9 to 19 inches is brown extremely channery sandy loam. The underlying material from 19 to 29 inches is indurated conglomerate bedrock.

Ohtwo soils occur on talus slopes of hills and escarpments on 20 to 60 percent slopes. They are very deep soils that are moderately slowly permeable over igneous bedrock. Typically the surface layer is brown very gravelly clay loam about 8 inches thick. The subsoil from 8 to 65 inches is brown very gravelly clay loam and very gravelly loam. The underlying material from 65 to 80 inches is indurated basalt bedrock.

Rock outcrop are areas of exposed bedrock on the summit, shoulder, and backslopes of hills and mountains, or as escarpments and ledges.

Of minor extent are areas of Decoty, Boludo, and Reduff soils which occur on hills and cuestas. Also, areas of Borunda and Gemelo soils occur on lower footslopes.

8. Studybutte-Terlingua-Rock outcrop

Very shallow to very shallow, well drained, loamy and very gravelly soils, and areas of exposed igneous bedrock

This map unit makes up about 6 percent of the survey area. It is about 47 percent Studybutte soils, 24 percent Terlingua soils, 21 percent Rock outcrop, and 8 percent other soils.

Studybutte soils occur on hills and mountains on 5 to 60 percent slopes. They are very shallow to very shallow soils that are moderately permeable over igneous bedrock. Typically the surface layer is reddish brown very gravelly loam about 3 inches thick. The subsurface layer from 3 to 6 inches is reddish brown extremely gravelly loam. The underlying material from 6 to 16 inches is indurated, igneous bedrock.

Terlingua soils occur on hills and mountains on 2 to 60 percent slopes. They are very shallow to very shallow soils that are moderately rapidly permeable over igneous bedrock. Typically the surface layer is very pale brown, calcareous, very gravelly sandy loam about 9 inches thick. The underlying material from 9 to 19 inches is indurated, igneous bedrock.

Rock outcrop are areas of exposed igneous bedrock on escarpments and ledges or exposed areas on the summits, shoulders, and backslopes of hills and mountains.

9. Geefour-Melado-Corazones

Very shallow to very deep, well drained, clayey or loamy and gravelly soils

This map unit makes up about 5 percent of the survey area. It is about 34 percent Geefour soils, 19 percent Melado soils, 15 percent Corazones soils, 11 percent Geefour soils, and 21 percent other soils.

Geefour soils occur on erosional hillslopes above desert floors on 5 to 45 percent slopes. They are very shallow to very shallow soils that are slowly permeable over mudstone bedrock. Typically, the surface layer is brown clay about 11 inches thick. The underlying material from 11 to 21 inches is pink mudstone that has a clay texture.

Melado soils occur on alluvial flats on 1 to 12 percent slopes. They are very deep soils that are very slowly permeable. Typically, the surface layer is yellowish brown silty clay about 4 inches thick. The upper subsoil from 4 to 44 inches is brown silty clay. The lower subsoil from 44 to 61 inches is light yellowish brown clay loam. The underlying material from 61 to 80 inches is brown clay.

Corazones soils occur on fan remnants and ballenas on 5 to 45 percent slopes. They are very deep soils that are moderately rapidly permeable. Typically, the surface layer is brown very gravelly sandy loam about 9 inches thick. The subsoil from 9 to 48 inches is light brown very cobbly sandy loam. The underlying material from 48 to 80 inches is pale brown extremely gravelly loamy coarse sand.

Of minor extent are small areas of Pantera and Ojinaga soils. Ojinaga soils occur on ridges. Pantera soils occur along drainageways.

10. Baviza-Pantera-Riverwash

Very deep, somewhat excessively *drained, sandy and gravelly soils*

This map unit makes up about 3 percent of the survey area. It is about 45 percent Baviza soils, 23 percent Pantera soils, 14 percent Riverwash, and 18 percent other soils.

Baviza soils occur on alluvial fans and fan skirts on 1 to 8 percent slopes. They are very deep soils that are rapidly permeable. Typically, the surface layer is yellowish brown loamy fine sand about 3 inches thick. The next layer from 3 to 29 inches is yellowish brown sand. The underlying material from 29 to 80 inches is yellowish brown gravelly sand.

Pantera soils occur on frequently flooded alluvial fans and drainageways on 0 to 2 percent slopes. They are very deep soils that are rapidly permeable. Typically, the surface layer is brown gravelly sandy loam about 3 inches thick. The next layer from 3 to 18 inches is brown gravelly and very gravelly loamy sand. The underlying material from 18 to 80 inches is brown stratified very gravelly coarse sand.

Riverwash consists of areas of cobbles and gravels in the main stream channel. These areas typically have little to no vegetation and undergo repeated high intensity flash flooding. Slopes range from 0 to 2 percent.

Of minor extent are areas of Vicente, Lomapelona, Castolon, and Galindo soils which occur along the flood plain of the Rio Grande.

11. Bissett–Rock outcrop

Very shallow to very shallow, well drained, loamy and gravelly soils, and areas of exposed limestone bedrock

This map unit makes up about 2 percent of the survey area. It is about 65 percent Bissett soils, 25 percent Rock outcrop, and 10 percent other soils.

Bissett soils occur on limestone hills, mesas, and escarpments on 1 to 60 percent slopes. They are very shallow to very shallow soils that are moderately permeable over limestone bedrock. Typically, the surface layer is grayish brown very gravelly loam about 2 inches thick. The subsoil from 2 to 9 inches is grayish brown very gravelly loam. The underlying material from 9 to 20 inches is indurated limestone bedrock.

Rock outcrop are areas of exposed limestone bedrock on escarpments and ledges or exposed areas on the summits, shoulders, and backslopes of hills and mountains.

12. Gemelo-Straddlebug-Borunda

Moderately deep to very deep, well drained, loamy to clayey and gravelly soils

This map unit makes up about 2 percent of the survey area. It is about 25 percent Gemelo soils, 25 percent Straddlebug soils, 23 percent Borunda soils, and 27 percent other soils.

Gemelo soils occur on fan aprons at the base of escarpments on 1 to 3 percent slopes. They are very deep soils that are moderately rapidly permeable. Typically, the surface layer is brown gravelly fine sandy loam about 6 inches thick. The upper part of the subsoil from 6 to 14 inches is brown loam. The middle part of the subsoil from 14 to 54 inches is pale brown fine sandy loam and very gravelly fine sandy loam. The lower part of the subsoil from 54 to 80 inches is light brownish gray gravelly sandy loam.

Straddlebug soils occur on alluvial flats and drainageways on 0 to 3 percent slopes. They are very deep soils that are moderately slowly permeable. Typically, the surface layer is pinkish gray silty clay loam about 4 inches thick. The subsurface layer from 4 to 11 inches is brown clay loam. The upper part of the subsoil from 11 to 26 inches is brown clay loam. The lower part of the subsoil from 26 to 80 inches is light brown sandy clay loam and fine sandy loam.

Borunda soils occur on pediments and erosional hillslopes on 1 to 8 percent slopes. They are moderately deep soils that are slowly permeable over tuffaceous bedrock.

Typically, the surface layer is light brown loam about 3 inches thick. The subsoil from 3 to 28 inches is pinkish gray clay loam. The underlying material from 28 to 40 inches is moderately cemented tuff bedrock.

Of minor extent are areas of Butcherknife and Martillo soils which occur on alluvial flats and drainageways.

13. Blackgap-Rock outcrop

Very shallow to very shallow, well drained, loamy and cobbly soils, and areas of exposed limestone bedrock

This map unit makes up about 1 percent of the survey area. It is about 65 percent Blackgap soils, 30 percent Rock outcrop, and 5 percent other soils.

Blackgap soils occur on hills, mountains, and escarpments on 10 to 60 percent slopes. They are very shallow to very shallow soils that are moderately permeable over limestone bedrock. Typically, the surface is pale brown very cobbly loam that is 4 inches thick. The subsurface layer from 4 to 9 inches is pale brown extremely cobbly silt loam. The underlying material from 9 to 20 inches is indurated limestone bedrock.

Rock outcrop are areas of exposed limestone bedrock on the summits, shoulders, and backslopes of hills and mountains, and include almost vertical escarpments and ledges.

14. Buckear-Catto-Coyanosa

Very shallow to very shallow, well drained, loamy and gravelly soils

This map unit makes up about 1 percent of the survey area. It is about 42 percent Buckear soils, 32 percent Catto soils, 13 percent Coyanosa soils, and 13 percent other soils.

Buckear soils occur on hills and ridges on 5 to 30 percent slopes. They are very shallow to very shallow soils that are moderately permeable over shale bedrock. Typically, the surface layer is brown very gravelly fine sandy loam about 2 inches thick. The subsurface layer from 2 to 7 inches is yellowish brown extremely gravelly fine sandy loam. The underlying material from 7 to 20 inches is shale bedrock.

Catto soils occur on hills and ridges on 30 to 45 percent slopes. They are very shallow to very shallow soils that are moderately permeable over chert bedrock. Typically, the surface layer is brown very gravelly clay loam about 7 inches thick. The underlying material from 7 to 20 inches is indurated chert bedrock.

Coyanosa soils occur on hills on 5 to 16 percent slopes. They are very shallow to very shallow soils that are moderately permeable over sandstone bedrock. Typically, the surface layer is dark yellowish brown very gravelly loam and extremely gravelly loam about 10 inches thick. The underlying material from 10 to 20 inches is strongly cemented sandstone bedrock.

Of minor extent are areas of Bissett soils which occur on limestone bedrock and Rock outcrop.

15. Mariscal-Rock outcrop-Strawhouse

Very shallow to very shallow, well drained, loamy and channery soils, and areas of exposed limestone bedrock

This map unit makes up about 1 percent of the survey area. It is about 63 percent Mariscal soils, 12 percent Rock outcrop, 11 percent Strawhouse soils, and 14 percent other soils.

Mariscal soils occur on limestone hills on 10 to 30 percent slopes. They are very shallow to very shallow soils that are moderately permeable over platy limestone bedrock. Typically, the surface is pale brown very channery loam that is 2 inches thick.

The subsurface layer from 2 to 5 inches is pale brown very channery loam. The underlying material from 5 to 40 inches is platy limestone bedrock.

Rock outcrop are areas of exposed limestone bedrock on the summits, shoulders, and backslopes of hills and mountains, and include almost vertical escarpments and ledges.

Strawhouse soils occur on pediment remnants on 1 to 16 percent slopes. They are very shallow to very shallow soils that are moderately permeable over a very slowly permeable petrocalcic horizon. Typically, the surface is light brownish gray very gravelly sandy loam that is 3 inches thick. The subsoil from 3 to 7 inches is light brownish gray very gravelly loam. The lower subsoil from 7 to 28 inches is a very pale brown strongly cemented petrocalcic horizon. The underlying material from 28 to 80 inches is very pale brown very gravelly sandy clay loam.

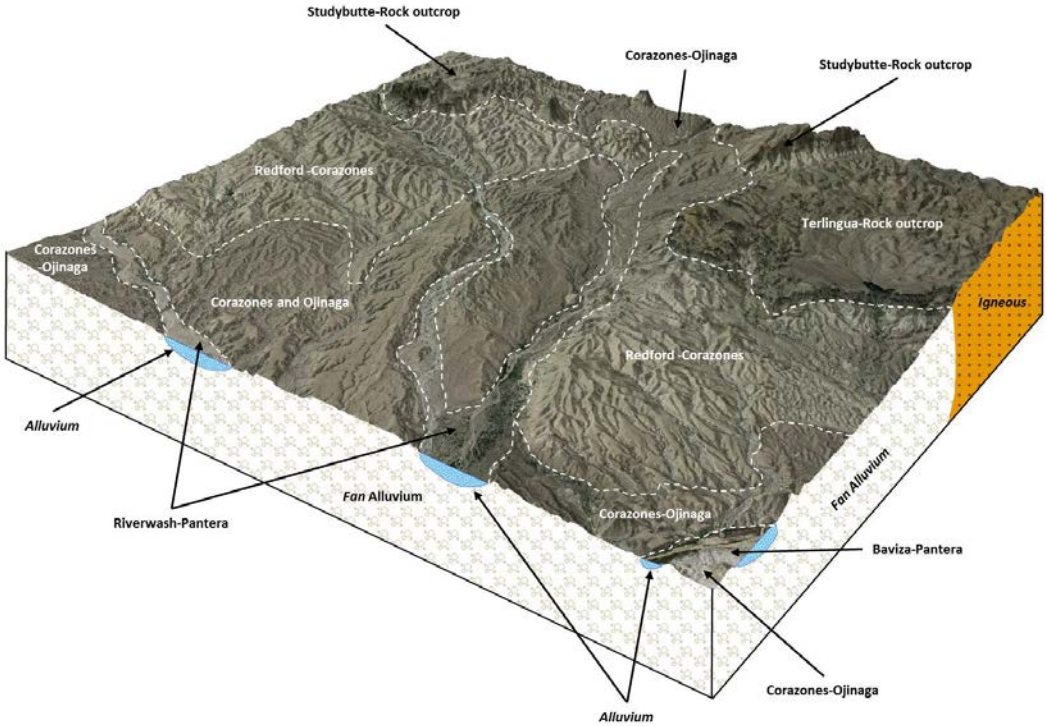

Figure 2.—Typical pattern of soils in the Corazones-Ojinaga-Redford, Baviza-Pantera-Riverwash and Studybutte-Terlingua-Rock outcrop general soil map units.

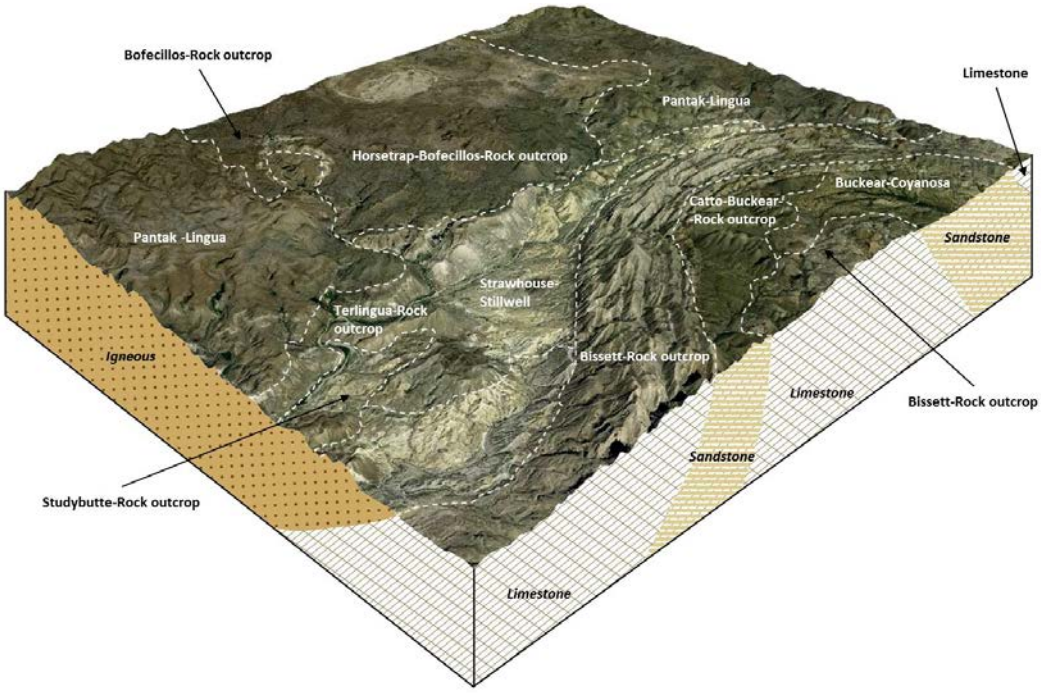

Figure 3.—Typical pattern of soils in the Studybutte-Terlingua-Rock outcrop, Mariscal-Rock outcrop-Strawhouse, Pantak-Lingua-Bofecillos-Horsetrap-Rock outcrop, Bissett-Rock outcrop and Buckear-Catto-Coyanosa general soil map units.

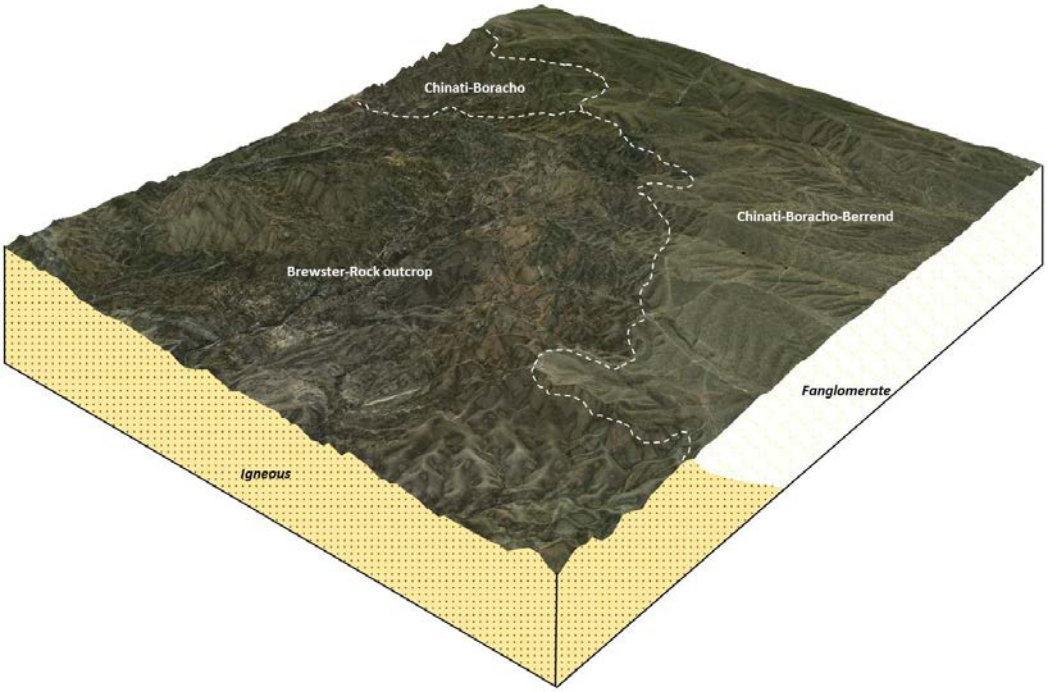

Figure 4.—Typical Pattern of soils in the Chinati-Boracho-Berend and the Brewster-Rock outcrop general soil map units.

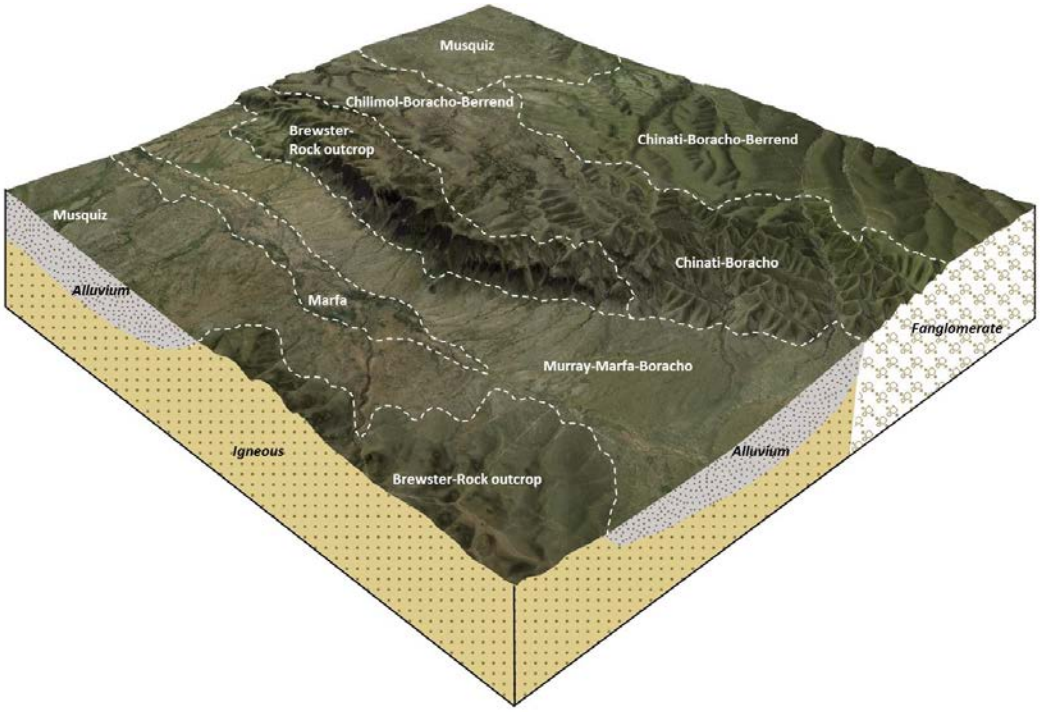

Figure 5.—Typical pattern of soils in the Musquiz-Murray-Marfa, Brewster-Rock Outcrop, and Chinati-Boracho-Chilimol-Berrend general soil map units.

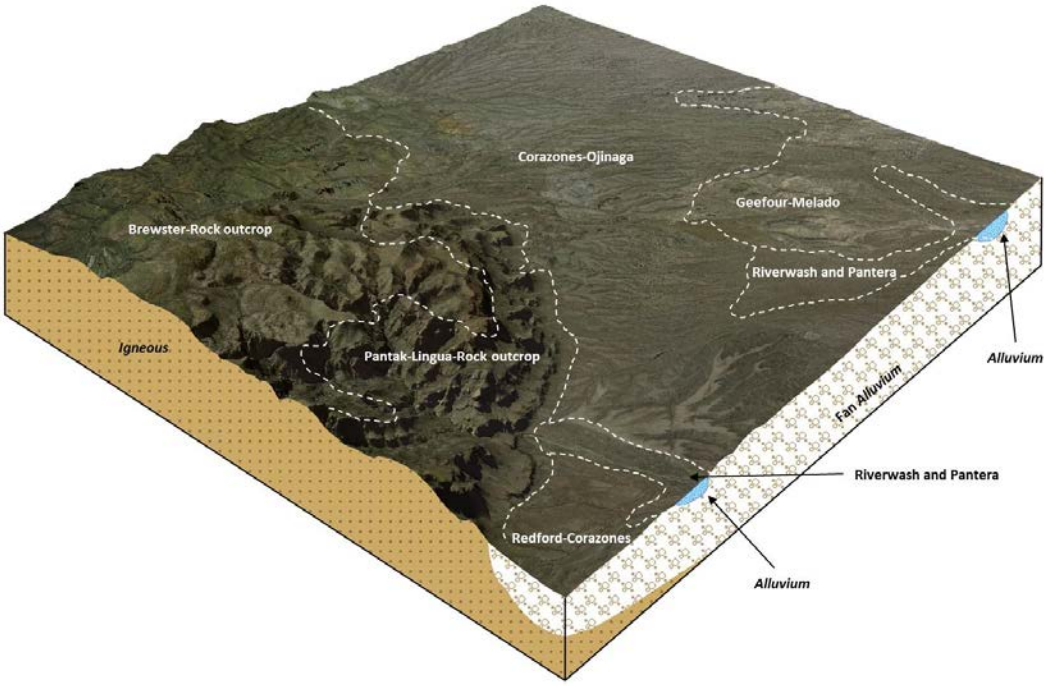

Figure 6.—Typical pattern of soils in the Corazones-Ojinaga-Redford, Melado-Geefour-Pantera, Pantak-Lingua-Bofecillos-Horsetrap-Rock Outcrop and Brewster-Rock outcrop general soil map units.

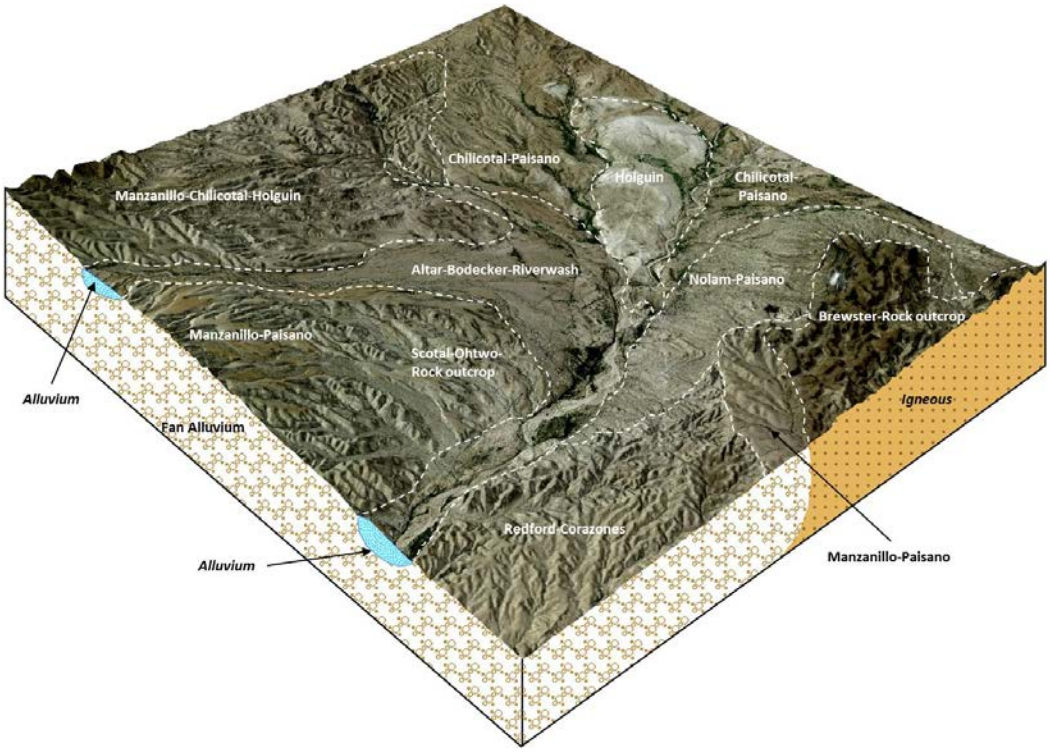

Figure 7.—Typical pattern of soils in the Manzanillo-Chilicotal-Paisano, Scotal-Sauceda-Holguin-Ohtwo-Rock outcrop, Altar-Bodecker-Tenneco-Riverwash, Corazones-Ojinaga-Redford, and Brewster-Rock outcrop general soil map units.

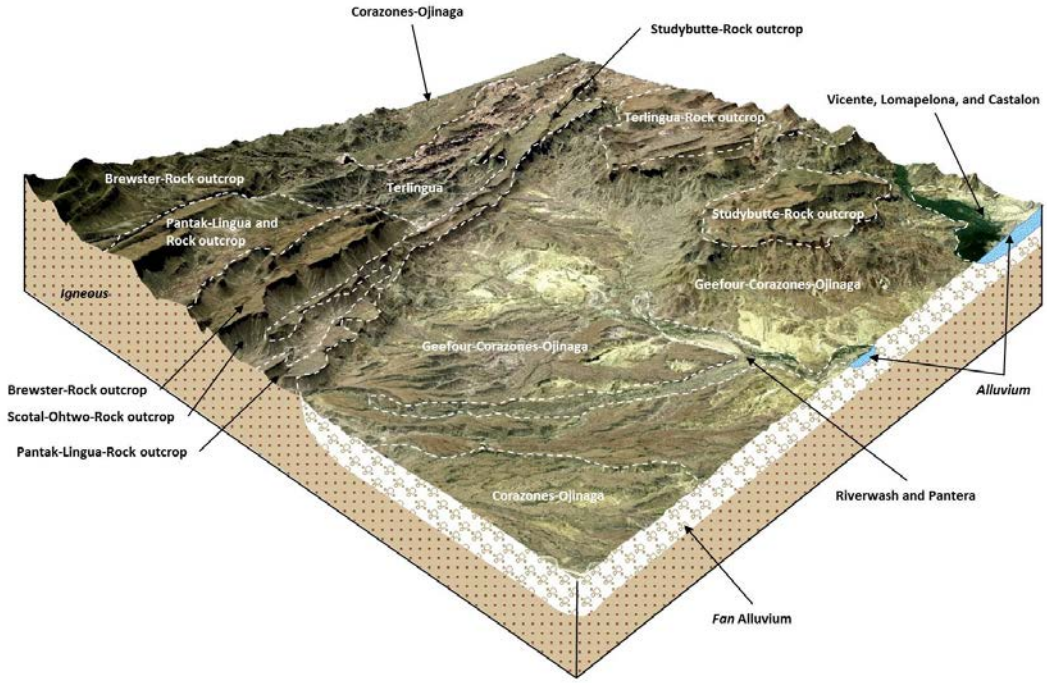

Figure 8.—Typical pattern of soils in the Studybutte-Terlingua-Rock outcrop, Geefour-Corazones, Pantak-Lingua-Bofecillos-Horsetrap-Rock outcrop and Brewster-Rock outcrop general soil map units.

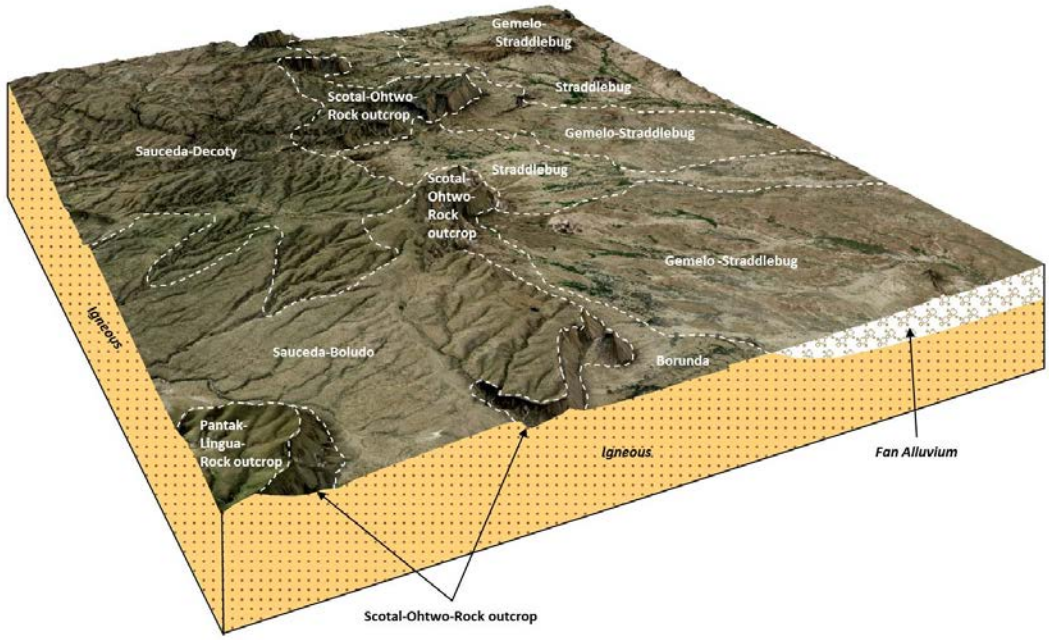

Figure 9.—Typical pattern of soils in the Scotal-Sauceda-Holguin-Ohtwo-Rock outcrop and Gemelo-Straddlebug-Borunda general soil map units.

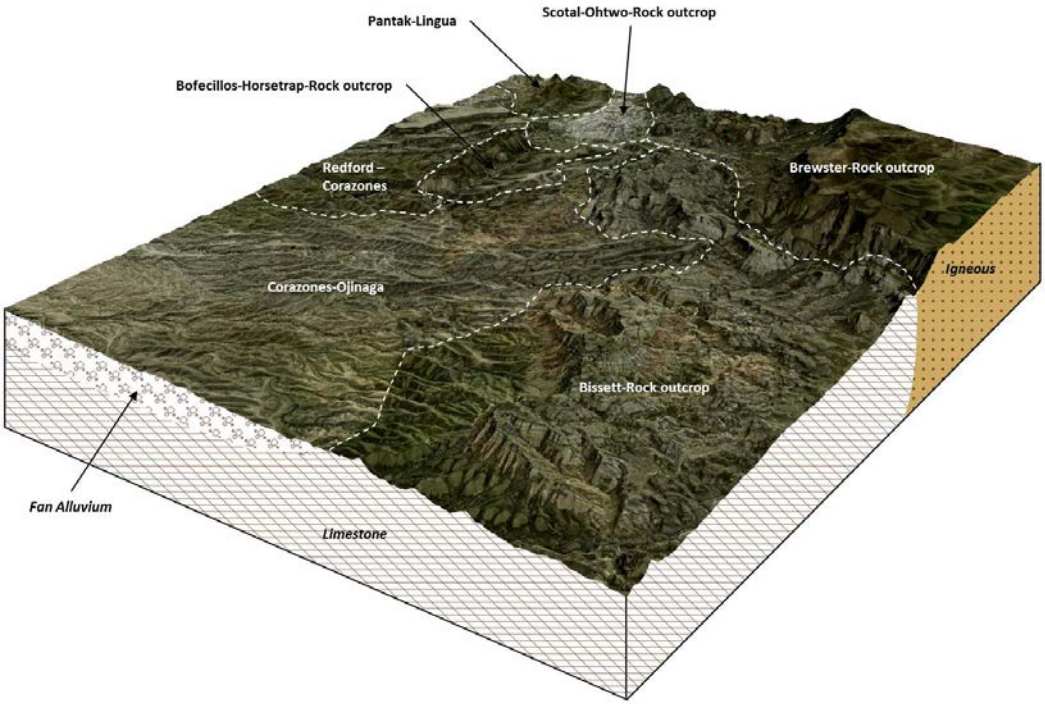

Figure 10.—Typical pattern of soils in the Bissett-Rock-outcrop and Brewster-Rock outcrop, Corazones-Ojinaga-Redford, Pantak-Lingua-Bofecillos-Horsetrap-Rock outcrop, general soil map units.

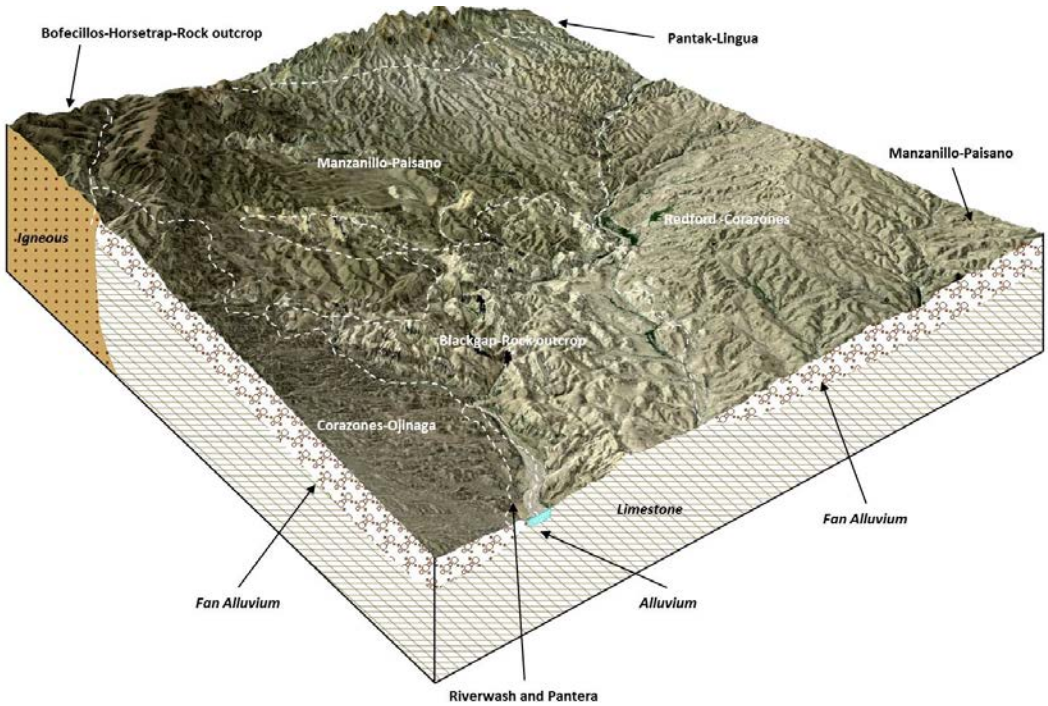

Figure 11.—Typical pattern of soils in the Blackgap-Rock outcrop, Manzanillo-Chilicotal-Paisano, Corazones-Ojinaga-Redford, and Pantak-Lingua-Bofecillos-Horsetrap-Rock outcrop general soil map units.

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, Marfa clay loam, 0 to 2 percent slopes, occasionally flooded is a phase of the Marfa series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Bissett-Rock outcrop complex, 5 to 30 percent slopes is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Altar-Bodecker-Riverwash association, 0 to 7 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Volco and Pardo soils, 1 to 8 percent slopes, is an example of an undifferentiated group in this survey area.

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

Composition of the soil is based on observations, descriptions, and or transects of the map unit. Major land uses of the soils throughout the survey area are used extensively for wildlife habitat and livestock grazing.

Map units with the term “moist” in their name, are mapped in the high end of the Ustic Aridic soil moisture regime. They are dominated by blue grama grasslands and are recognized by the Rangeland Management Specialists as having much higher production. Because of these characteristics, these map units have a “moist” designation so that users will be informed about the higher production levels.

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section. For more information about managing the soils, 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." The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Acreage and Proportionate Extent of the Soils shown in Table 10 lists the map units in this survey area. Other tables show properties of the soils and the limitations, capabilities, and potentials for many uses.

ALB—Altar-Bodecker-Riverwash association, 0 to 7 percent slopes, flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 90 percent

Altar and similar soils: 45 percent

Bodecker and similar soils: 30 percent

Riverwash and similar soils: 15 percent
Minor components: 10 percent
Unnamed soils occur throughout the unit: 9 percent
Unnamed hydric soils occur on lower positions along the channel: 1 percent

Major Component Descriptions

Altar

Landforms: Flood-plain steps
Geomorphic positions, two-dimensional: Summit
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 10 inches; moderately alkaline gravelly sandy loam
Bk1—10 to 26 inches; moderately alkaline extremely gravelly sandy loam
Bk2—26 to 80 inches; moderately alkaline extremely gravelly fine sandy loam

Properties and Qualities

Slope: 1 to 7 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 5 percent subrounded cobbles
Depth to first restrictive layer: No restrictive layer
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 2.9 inches (very low)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: Rare

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

Bodecker

Landforms: Flood plains
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 5 inches; moderately alkaline very gravelly loamy sand
C1—5 to 30 inches; strongly alkaline extremely cobbly coarse sand

C2—30 to 80 inches; strongly alkaline extremely gravelly coarse sand

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 20 percent subrounded gravel, about 20 percent subrounded cobbles, about 20 percent subrounded stones
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 6.0 to 20 in/hr (rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 1.3 inches (very low)
Natural drainage class: Somewhat excessively drained
Runoff: Very low
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Arroyo, Desert Grassland
Ecological site number: R042XC749TX
Typical vegetation: Western honey mesquite, desert willow, sideoats grama, other perennial grasses, littleleaf sumac, whitebrush, catclaw acacia, Apache plume, cane bluestem, sand dropseed, alkali sacaton, giant sacaton, other shrubs, other forbs, creosotebush, plains bristlegrass, whiplash pappusgrass, baccharis

Riverwash

Landforms: Flood plains
Parent material: Holocene age sandy and gravelly alluvium derived from igneous and sedimentary rock

Properties and Qualities

Slope: 0 to 2 percent
Depth to first restrictive layer: No restrictive layer
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
Runoff: Very low
Flooding frequency: Frequent

Interpretive Groups

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

ANS—Area Not Surveyed

The soil survey information in these areas is not available.

BAC—Baviza-Pantera complex, 1 to 8 percent slopes, flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 96 percent
Baviza and similar soils: 75 percent
Pantera and similar soils: 21 percent
Minor components: 4 percent
Corazones soils have a loamy-skeletal control section and occur on higher side slopes: 4 percent

Major Component Descriptions

Baviza

Landforms: Alluvial fans (fig. 12)
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Sandy fan alluvium derived from igneous rock

Typical Profile

A—0 to 3 inches; moderately alkaline loamy fine sand
C1—3 to 29 inches; moderately alkaline sand
C2—29 to 80 inches; moderately alkaline gravelly sand

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 8 percent gravel, about 2 percent cobbles
Depth to first restrictive layer: No restrictive layer
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 2.5 inches (very low)
Natural drainage class: Somewhat excessively drained
Runoff: Very low
Flooding frequency: Rare

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Loamy Sand, Hot Desert Shrub
Ecological site number: R042XG742TX

Figure 12.—Baviza loamy fine sand in an area of Baviza-Pantera complex, 1 to 8 percent slopes, flooded. Baviza soils are on alluvial fans. Vegetation consists of creosotebush, Warnock's condalia, leatherstem, and soaptree yucca. The Baviza soils are in the Loamy Sand, Hot Desert Shrub vegetative zone.

Typical vegetation: Sand dropseed, spike dropseed, mesa dropseed, black grama, bush muhly, other perennial grasses, other perennial forbs, creosotebush, western honey mesquite, other shrubs, fourwing saltbush, croton, threeawn, triden, soaptree yucca

Pantera

Landforms: Flood plains
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 2 inches; strongly alkaline very gravelly coarse sand
C—2 to 80 inches; strongly alkaline very gravelly coarse sand

Properties and Qualities

Slope: 1 to 2 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 5 percent subrounded cobbles, about 40 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 6.0 to 20 in/hr (rapid)

Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 1.2 inches (very low)
Natural drainage class: Excessively drained
Runoff: Very low
Flooding frequency: Frequent

Interpretive Groups

Land capability nonirrigated: 7w
Ecological site name: Arroyo, Hot Desert Shrub
Ecological site number: R042XG736TX
Typical vegetation: Western honey mesquite, other shrubs, creosotebush, other perennial grasses, desert willow, catclaw acacia, sideoats grama, tanglehead, cane bluestem, black grama, Chino grama, croton, other perennial forbs, sand dropseed, elbowbush, spiny hackberry, Warnock condalia, whiplash pappusgrass, leatherstem, Trans-Pecos poreleaf

BEB—Berrend and Espy soils, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 89 percent
Berrend and similar soils: 72 percent
Espy and similar soils: 17 percent
Minor components: 11 percent
Musquiz soils have a fine-textured control section and occur on similar positions: 11 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Berrend

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Loamy alluvium derived from igneous rock

Typical Profile

A—0 to 2 inches; slightly alkaline sandy clay loam
Bt—2 to 19 inches; slightly alkaline sandy clay loam and clay loam
Btk—19 to 38 inches; moderately alkaline clay loam
Bk—38 to 60 inches; moderately alkaline loam
C—60 to 80 inches; moderately alkaline fine sandy loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 1 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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 10.4 inches (high)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3c
Ecological site name: Loamy Slope, Mixed Prairie
Ecological site number: R042XE694TX
Typical vegetation: Black grama, blue grama, sideoats grama, other perennial grasses, other shrubs, cane bluestem, bristlegrass, other forbs, sand muhly, sand dropseed, spiderling grass, Ephedra, woolly butterflybush, soaptree yucca

Espy

Landforms: Fan piedmonts
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Crest, interfluve
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Gravelly alluvium derived from igneous rock

Typical Profile

A—0 to 4 inches; moderately alkaline fine sandy loam
Bk—4 to 12 inches; moderately alkaline fine sandy loam
Bkkm—12 to 18 inches; cemented material
CBk—18 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 8 percent subrounded gravel
Depth to first restrictive layer: 10 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.4 inches (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

BIC—Bissett-Rock outcrop complex, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
Bissett and similar soils: 65 percent
Rock outcrop and similar soils: 20 percent
Minor components: 15 percent
Unnamed soils occur throughout the unit: 10 percent
Bankston soils are moderately deep to bedrock and occur throughout the unit: 5 percent

Major Component Descriptions

Bissett

Landforms: Ridges
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from limestone

Typical Profile

Ak—0 to 2 inches; moderately alkaline very gravelly loam
Bk—2 to 9 inches; moderately alkaline very gravelly loam
R—9 to 19 inches; limestone bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 2 percent subangular boulders, about 10 percent subangular cobbles, about 35 percent subangular gravel, about 3 percent subangular stones
Depth to first restrictive layer: 7 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.9 inches (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill and Mountain, Desert Grassland
Ecological site number: R042XC249TX
Typical vegetation: Black grama, sideoats grama, triden, other forbs, other perennial grasses, other shrubs, Arizona cottontop, threeawn, feather pappusgrass, fluffgrass, range ratany, lechuguilla, creosotebush, skeletonleaf goldeneye

Rock outcrop

Landforms: Ridges
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 3 to 8 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

BIE—Bissett-Rock outcrop complex, 5 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
Bissett and similar soils: 60 percent
Rock outcrop and similar soils: 25 percent
Minor components: 15 percent
Unnamed soils occur throughout the unit: 15 percent

Major Component Descriptions

Bissett

Landforms: Hills, mountains (fig. 13)
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from limestone

Figure 13.—Bissett-Rock outcrop complex, 5 to 30 percent slopes. Bissett soils are on summits, shoulders, and backslopes of hills and mountains. Bissett soils formed from limestone.

Properties and Qualities

Slope: 5 to 30 percent
Percent of area covered by surface fragments: About 13 percent subangular boulders, about 12 percent subangular stones, about 21 percent subangular cobbles, about 34 percent subangular gravel
Depth to first restrictive layer: 7 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.9 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill and Mountain, Desert Grassland
Ecological site number: R042XC249TX
Typical vegetation: Black grama, sideoats grama, triden, other forbs, other perennial grasses, other shrubs, Arizona cottontop, threeawn, feather pappusgrass, fluffgrass, range ratany, lechuguilla, creosotebush, skeletonleaf goldeneye

Rock outcrop

Landforms: Ledges on hills, ledges on mountains
Geomorphic positions, three-dimensional: Side slope, base slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 5 to 30 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

BIG—Bissett-Rock outcrop complex, 20 to 70 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Hills, mountains
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 95 percent
Bissett and similar soils: 70 percent
Rock outcrop and similar soils: 25 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Major Component Descriptions

Bissett

Landforms: Escarpments, mountains
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from limestone

Typical Profile

Ak—0 to 2 inches; moderately alkaline very gravelly loam
Bk—2 to 9 inches; moderately alkaline very gravelly loam
R—9 to 19 inches; limestone bedrock

Properties and Qualities

Slope: 20 to 60 percent
Percent of area covered by surface fragments: About 18 percent subangular boulders, about 17 percent subangular stones, about 20 percent subangular cobbles, about 25 percent subangular gravel
Depth to first restrictive layer: 7 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.9 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill and Mountain, Desert Grassland

Ecological site number: R042XC249TX
Typical vegetation: Black grama, sideoats grama, triden, other forbs, other perennial grasses, other shrubs, Arizona cottontop, threeawn, feather pappusgrass, fluffgrass, range ratany, lechuguilla, creosotebush, skeletonleaf goldeneye

Rock outcrop

Landforms: Ledges on escarpments, free faces on escarpments, ledges on mountains, free faces on mountains
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 20 to 70 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

BLE—Blackgap-Rock outcrop complex, 10 to 30 percent slopes

Setting

Major land resource area: MLRA 81D—Southern Edwards Plateau
Landscape: Mountains, hills
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 97 percent
Blackgap and similar soils: 52 percent
Rock outcrop and similar soils: 45 percent
Minor components: 3 percent
Unnamed soils occur throughout the unit: 3 percent

Major Component Descriptions

Blackgap

Landforms: Hills, mountains

Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from limestone

Typical Profile

A—0 to 4 inches; moderately alkaline very gravelly silt loam
Ak—4 to 9 inches; moderately alkaline extremely cobbly silt loam
R—9 to 20 inches; limestone bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 4 percent subangular boulders, about 6 percent subangular stones, about 15 percent subangular cobbles, about 35 percent subangular gravel
Depth to first restrictive layer: 6 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.9 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill and Mountain 8-14" PZ
Ecological site number: R081DY592TX
Typical vegetation: Chino grama, other perennial grasses, black grama, other forbs, sideoats grama, other shrubs, guayacan, cenizo, triden, creosotebush, lechuguilla, candelilla, ocotillo

Rock outcrop

Landforms: Ledges on hills, ledges on mountains
Geomorphic positions, three-dimensional: Free face
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 10 to 30 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

BLG—Blackgap-Rock outcrop complex, 20 to 70 percent slopes

Setting

Major land resource area: MLRA 81D—Southern Edwards Plateau
Landscape: Mountains, hills
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 95 percent
Blackgap and similar soils: 75 percent
Rock outcrop and similar soils: 20 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 3 percent
Corazones soils formed in deep, gravelly alluvial fan sediments and occur on higher summit or side slopes: 2 percent

Major Component Descriptions

Blackgap

Landforms: Escarpments, mountains
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from limestone

Typical Profile

A—0 to 4 inches; moderately alkaline very gravelly silt loam
Ak—4 to 9 inches; moderately alkaline extremely cobbly silt loam
R—9 to 20 inches; limestone bedrock

Properties and Qualities

Slope: 20 to 60 percent
Percent of area covered by surface fragments: About 2 percent subangular boulders, about 10 percent subangular cobbles, about 35 percent subangular gravel, about 3 percent subangular stones
Depth to first restrictive layer: 6 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.9 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill and Mountain 8-14" PZ
Ecological site number: R081DY592TX
Typical vegetation: Chino grama, other perennial grasses, black grama, other forbs, sideoats grama, other shrubs, guayacan, cenizo, triden, creosotebush, lechuguilla, candelilla, ocotillo

Rock outcrop

Landforms: Ledges on escarpments, free faces on escarpments, ledges on mountains, free faces on mountains
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 20 to 70 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

BNE—Bofecillos-Horsetrap-Rock outcrop complex, 10 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches

Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 75
Bofecillos and similar soils: 50 percent
Horsetrap and similar soils: 25 percent
Minor components: 25 percent
Pantak soils have an argillic horizon and occur on similar positions: 15 percent
Ohtwo soils are deep to bedrock and occur on lower colluvial side or footslopes: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Major Component Descriptions

Bofecillos

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Mountaintop, mountainflank, interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from basalt

Typical Profile

A—0 to 3 inches; slightly alkaline extremely gravelly sandy clay loam
R—3 to 13 inches; basalt bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 75 percent subangular gravel, about 5 percent subangular cobbles
Depth to first restrictive layer: 2 to 10 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first water and root restrictive layer: Moderately slow (0.2 to 0.6 in/hr)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: Moderately slow (0.2 to 0.6 in/hr)
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 0.2 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Horsetrap

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Mountaintop, mountainflank, interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly slope alluvium and/or residuum weathered from basalt

Typical Profile

A—0 to 3 inches; slightly alkaline extremely gravelly sandy clay loam
Bk—3 to 16 inches; moderately alkaline extremely gravelly sandy clay loam
R—16 to 26 inches; basalt bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 50 percent subangular gravel, about 10 percent subangular cobbles
Depth to first restrictive layer: 10 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first restrictive layer: Moderate (0.6 to 2.0 in/hr)
Slowest permeability from first cemented restrictive layer to 60 inches: Moderate (0.6 to 2.0 in/hr)
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 0.9 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Rock outcrop

Landforms: Ledges on hills, free faces on hills, ledges on mountains, free faces on mountains
Geomorphic positions, three-dimensional: Mountainflank, free face
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Basalt

Typical Profile

R—0 to 10 inches; basalt bedrock

Properties and Qualities

Slope: 12 to 60 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

BNG—Bofecillos-Rock outcrop complex, 12 to 60 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
- Bofecillos and similar soils: 45 percent
- Rock outcrop and similar soils: 40 percent

Minor components: 15 percent
- Horsetrap are shallow to bedrock, have a cambic horizon, and occur on similar positions: 5 percent
- Ohtwo soils are deep to bedrock and occur on lower colluvial side or footslopes: 5 percent
- Paisano soils are shallow to a petrocalcic horizon and occur on lower footslopes: 5 percent

Major Component Descriptions

Bofecillos

Landforms: Mountains, hills, escarpments
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Mountaintop, mountainbase, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from basalt

Typical Profile

A—0 to 6 inches; slightly alkaline very gravelly loam
R—6 to 16 inches; basalt bedrock

Properties and Qualities

Slope: 12 to 50 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 20 percent subrounded cobbles, about 5 percent subrounded stones, about 5 percent subrounded boulders
Depth to first restrictive layer: 4 to 10 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Rock outcrop

Landforms: Ledges on hills, free faces on hills, ledges on mountains, free faces on mountains
Geomorphic positions, three-dimensional: Mountainflank, free face
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Basalt

Typical Profile

R—0 to 10 inches; basalt bedrock

Properties and Qualities

Slope: 12 to 60 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

BOB—Boracho-Espy complex, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 80 percent
Boracho and similar soils: 60 percent
Espy and similar soils: 20 percent
Minor components: 20 percent
Pardo soils are shallow to hard bedrock and occur on lower side slopes: 10 percent
Chilimol soils do not have a petrocalcic horizon and occur on lower side slopes: 5 percent
Musquiz soils have a fine textured control section, do not have a petrocalcic horizon, and occur on slightly lower depressions or drainages: 5 percent

Major Component Descriptions

Boracho

Landforms: Fans piedmonts (fig. 14)
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve, crest
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Gravelly alluvium derived from igneous rock

Typical Profile

A—0 to 7 inches; moderately alkaline very gravelly sandy clay loam
Bk—7 to 15 inches; moderately alkaline extremely gravelly sandy clay loam
Bkkm—15 to 19 inches; cemented material
BCk—19 to 41 inches; moderately alkaline extremely gravelly sandy clay loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 35 percent subangular gravel, about 5 percent subangular cobbles
Depth to first restrictive layer: 7 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.1 inches (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Figure 14.—Boracho soils in an area of Boracho-Espy complex, 1 to 8 percent slopes. Boracho soils are on summits of fan piedmonts. Vegetation consists of black grama, sideoats grama, blue grama, allthorn, and viscid acacia.

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

Espy

Landforms: Fan piedmonts
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve, crest
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous rock

Typical Profile

A—0 to 6 inches; moderately alkaline gravelly loam
Bk—6 to 17 inches; moderately alkaline gravelly loam
Bkkm—17 to 24 inches; cemented material
BCk—24 to 80 inches; moderately alkaline very gravelly sandy clay loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 22 percent subangular gravel, about 3 percent subangular cobbles
Depth to first restrictive layer: 10 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 2.1 inches (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

BOC—Borunda soils, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
Borunda and similar soils: 60 percent
Borunda gravelly and similar soils: 20 percent
Minor components: 20 percent
Unnamed soils occur throughout the unit: 20 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Borunda

Landforms: Pediments

Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Interfluve, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Loamy residuum and/or pedisediment derived from tuff

Typical Profile

A—0 to 3 inches; moderately alkaline loam
Bk—3 to 12 inches; moderately alkaline clay
Bky—12 to 28 inches; strongly alkaline clay
Cr—28 to 40 inches; moderately cemented tuff bedrock
R—40 to 62 inches; strongly cemented tuff bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 5 percent subrounded gravel
Depth to first restrictive layer: 20 to 40 inches to bedrock, paralithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 3.9 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC250TX
Typical vegetation: Blue grama, black grama, burrograss, other perennial grasses, tobosa, sideoats grama, other forbs, Arizona cottontop, plains bristlegrass, bush muhly, cane bluestem, other shrubs, tarbush

Borunda soils, gravelly

Landforms: Pediments
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Interfluve, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Loamy residuum and/or pedisediment derived from tuff

Typical Profile

A—0 to 5 inches; moderately alkaline gravelly clay loam
Bw—5 to 12 inches; moderately alkaline gravelly clay
Bky—12 to 30 inches; strongly alkaline clay
Cr—30 to 40 inches; moderately cemented tuff bedrock
R—40 to 62 inches; strongly cemented tuff bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 30 percent subrounded gravel (fig. 15)
Depth to first restrictive layer: 20 to 40 inches to bedrock, paralithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 3.9 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

Figure 15.—Surface fragments on the Borunda gravelly component of Borunda soils, 1 to 8 percent slopes. Borunda gravelly soils are on fan remnants and pediments.

BRD—Brewster very gravelly loam, 1 to 12 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 75 percent
Brewster and similar soils: 75 percent
Minor components: 25 percent
Mainstay soils have a clayey-skeletal control section and occur on similar positions: 10 percent
Rock outcrop: 10 percent
Liv soils are moderately deep to bedrock, have a clayey-skeletal control section, and occur on similar positions: 5 percent

Major Component Descriptions

Brewster

Landforms: Hills, mountains (fig. 16)
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Lower third of mountainflank, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from trachyte and/or basalt

Typical Profile

A—0 to 4 inches; neutral very gravelly loam
R—4 to 14 inches; trachyte bedrock

Properties and Qualities

Slope: 1 to 12 percent
Percent of area covered by surface fragments: About 2 percent subangular stones, about 28 percent subangular cobbles, about 49 percent subangular gravel
Depth to first restrictive layer: 2 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

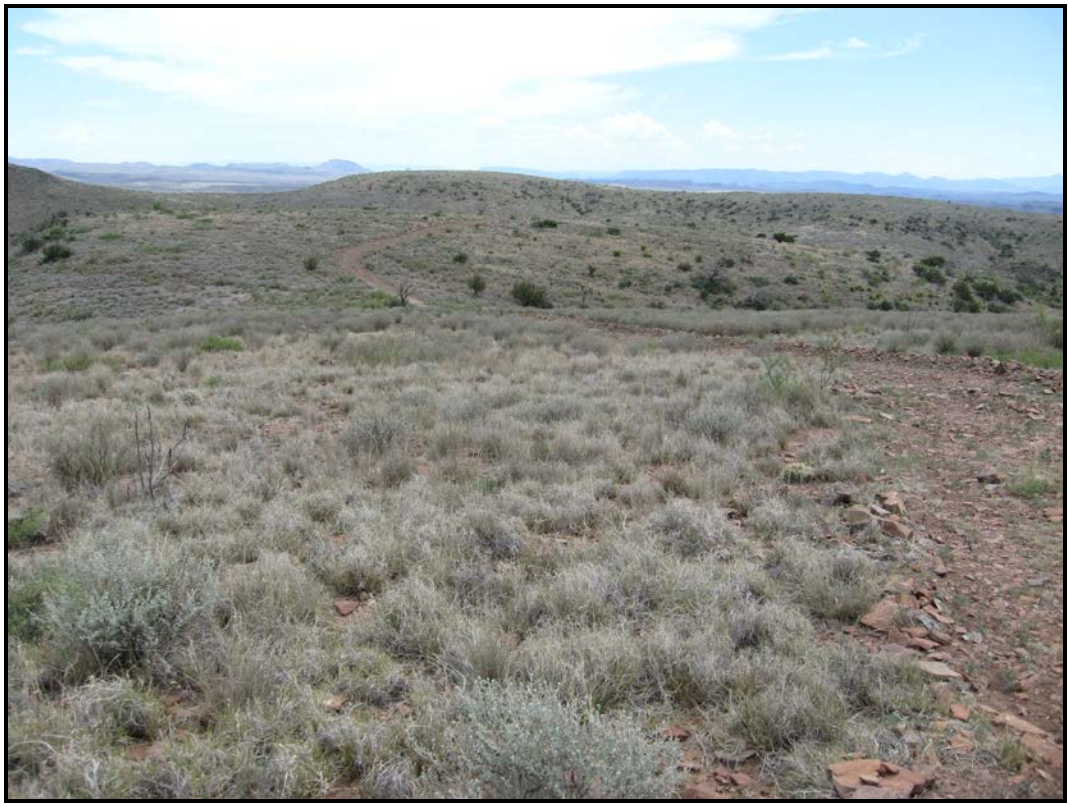

Figure 16.—An area of Brewster very gravelly loam, 1 to 12 percent slopes. Brewster soils formed from igneous bedrock and occur on hills and mountains.

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Mixed Prairie
Ecological site number: R042XE277TX
Typical vegetation: Sideoats grama, cane bluestem, other perennial grasses, black grama, blue grama, little bluestem, Texas bluestem, tanglehead, other forbs, other shrubs, plains lovegrass, green sprangletop, feathery dalea, gray oak, redberry juniper

BRF—Brewster-Rock outcrop complex, 10 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 80 percent
Brewster and similar soils: 65 percent
Rock outcrop and similar soils: 15 percent
Minor components: 20 percent

Sanmoss soils are very deep to bedrock and occur on lower side and footslopes: 6 percent
Volco soils have a calcic horizon and occur on similar positions: 6 percent
Unnamed soils occur throughout the unit: 5 percent
Chilimol soils are very deep to bedrock, have a calcic horizon, and occur on lower side and footslopes: 3 percent

Major Component Descriptions

Brewster

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from trachyte and/or basalt

Typical Profile

A—0 to 4 inches; neutral very gravelly clay loam
R—4 to 14 inches; trachyte bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 5 percent subangular boulders, about 10 percent subangular stones, about 25 percent subangular cobbles, about 20 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Mixed Prairie
Ecological site number: R042XE277TX
Typical vegetation: Sideoats grama, cane bluestem, other perennial grasses, black grama, blue grama, little bluestem, Texas bluestem, tanglehead, other forbs, other shrubs, plains lovegrass, green sprangletop, feathery dalea, gray oak, redberry juniper

Rock outcrop

Landforms: Hills, mountains
Parent material: Basalt and/or trachyte

Typical Profile

R—0 to 10 inches; basalt bedrock

Properties and Qualities

Slope: 10 to 30 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

BRG—Brewster-Rock outcrop complex, 20 to 70 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 85 percent
- Brewster and similar soils: 60 percent
- Rock outcrop and similar soils: 25 percent

Minor components: 15 percent
- Chilimol soils are very deep to bedrock, have a calcic horizon, and occur on lower footslopes: 5 percent
- Mainstay soils have a clayey-skeletal control section and occur on similar positions: 5 percent
- Musquiz soils have a fine textured control section, an argillic horizon, and occur on lower footslopes: 5 percent

Major Component Descriptions

Brewster

Landforms: Mountains (fig. 17)
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Mountainflank, mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from trachyte and/or basalt

Figure 17.—A backslope on an area of Brewster-Rock outcrop complex, 20 to 70 percent slopes. Brewster soils occur on mountains of trachyte, basalt, and igneous bedrock.

Typical Profile

A1—0 to 4 inches; neutral very cobbly loam
A2—4 to 11 inches; slightly alkaline very cobbly clay loam
R—11 to 20 inches; trachyte bedrock

Properties and Qualities

Slope: 20 to 60 percent
Percent of area covered by surface fragments: About 5 percent subangular boulders, about 10 percent subangular stones, about 25 percent subangular cobbles, about 20 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Mixed Prairie
Ecological site number: R042XE277TX
Typical vegetation: Sideoats grama, cane bluestem, other perennial grasses, black grama, blue grama, little bluestem, Texas bluestem, tanglehead, other forbs, other shrubs, plains lovegrass, green sprangletop, feathery dalea, gray oak, redberry juniper

Rock outcrop

Landforms: Ledges on mountains, free faces on mountains
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Mountainflank, mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Basalt and/or trachyte

Typical Profile

R—0 to 10 inches; basalt bedrock

Properties and Qualities

Slope: 20 to 70 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

BUD—Buckear-Coyanosa complex, 5 to 16 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Hills
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 90 percent
Buckear and similar soils: 55 percent
Coyanosa and similar soils: 35 percent
Minor components: 10 percent
Unnamed soils occur throughout the unit: 10 percent

Major Component Descriptions

Buckear

Landforms: Hills
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from shale

Typical Profile

A—0 to 7 inches; moderately alkaline very gravelly loam
Cr—7 to 24 inches; shale bedrock

Properties and Qualities

Slope: 5 to 16 percent
Percent of area covered by surface fragments: About 1 percent subangular stones, about 30 percent subangular cobbles, about 45 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, paralithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Sandstone Hill and Mountain, Desert Grassland
Ecological site number: R042XC255TX
Typical vegetation: Black grama, sideoats grama, sand dropseed, other perennial grasses, spike dropseed, Arizona cottontop, feather pappusgrass, other forbs, triden, creosotebush, skeletonleaf goldeneye, other shrubs, range ratany, ocotillo, lechuguilla

Coyanosa

Landforms: Hills
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from sandstone

Typical Profile

A—0 to 7 inches; slightly alkaline extremely gravelly fine sandy loam
R—7 to 17 inches; sandstone bedrock

Properties and Qualities

Slope: 5 to 16 percent
Percent of area covered by surface fragments: About 1 percent subangular stones, about 18 percent subangular cobbles, about 60 percent subangular gravel
Depth to first restrictive layer: 3 to 14 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Sandstone Hill and Mountain, Desert Grassland
Ecological site number: R042XC255TX
Typical vegetation: Black grama, sideoats grama, sand dropseed, other perennial grasses, spike dropseed, Arizona cottontop, feather pappusgrass, other forbs, triden, creosotebush, skeletonleaf goldeneye, other shrubs, range ratany, ocotillo, lechuguilla

CAA—Castolon silty clay loam, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: River valleys
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 79 percent
Castolon and similar soils: 79 percent
Minor components: 21 percent
Galindo soils have a clayey control section in the upper part and occur on slightly lower positions: 10 percent
Lomapelona soils have a coarse-loamy control section and occur on similar positions: 10 percent
Unnamed hydric soils occur on slightly lower positions: 1 percent

Major Component Descriptions

Castolon

Landforms: Flood plains
Geomorphic positions, two-dimensional: Toeslope

Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

Ap—0 to 11 inches; moderately alkaline silty clay loam and loam
C1—11 to 23 inches; moderately alkaline silty clay loam
C2—23 to 80 inches; moderately alkaline silt loam and silty clay loam

Properties and Qualities

Slope: 0 to 1 percent
Percent of area covered by surface fragments: About 1 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 12.0 inches (very high)
Natural drainage class: Moderately well drained
Runoff: Negligible
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: 2w
Ecological site name: Loamy Bottomland, Hot Desert Shrub
Ecological site number: R042XG733TX
Typical vegetation: Giant sacaton, alkali sacaton, other shrubs, other perennial grasses, other trees, fourwing saltbush, tarbush, cottonwood, cane bluestem, sideoats grama, false Rhodes grass, western honey mesquite, plains bristlegrass, white triden, pink pappusgrass, other perennial forbs, spiny aster, other annual forbs.

CAG—Catto-Buckear-Rock outcrop complex, 20 to 60 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Hills, low mountains
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 95 percent
Catto and similar soils: 50 percent
Buckear and similar soils: 35 percent
Rock outcrop and similar soils: 10 percent
Minor components: 5 percent
Bissett soils are shallow to hard limestone bedrock, have a calcic horizon, and occur on similar positions: 5 percent

Major Component Descriptions

Catto

Landforms: Ridges, hillslopes
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from chert

Typical Profile

A—0 to 7 inches; slightly alkaline very gravelly clay loam
R—7 to 17 inches; chert bedrock

Properties and Qualities

Slope: 30 to 45 percent
Percent of area covered by surface fragments: About 3 percent angular stones, about 26 percent angular cobbles, about 58 percent angular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Chert Hill, Desert Grassland
Ecological site number: R042XC240TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, cane bluestem, tanglehead, Arizona cottontop, green sprangletop, other perennial forbs, bristlegrass, triden, sand dropseed, other shrubs, skeletonleaf goldeneye, range ratany, desert myrtlecroton, feather dalea, bundleflower, catclaw acacia

Buckear

Landforms: Ridges, hills
Geomorphic positions, two-dimensional: Backslope, footslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from shale

Typical Profile

A—0 to 13 inches; moderately alkaline very gravelly loam
Cr—13 to 24 inches; shale bedrock

Properties and Qualities

Slope: 20 to 30 percent
Percent of area covered by surface fragments: About 55 percent subangular gravel, about 35 percent subangular cobbles, about 1 percent subangular stones
Depth to first restrictive layer: 4 to 20 inches to bedrock, paralithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.8 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Sandstone Hill and Mountain, Desert Grassland
Ecological site number: R042XC255TX
Typical vegetation: Black grama, sideoats grama, sand dropseed, other perennial grasses, spike dropseed, Arizona cottontop, feather pappusgrass, other forbs, triden, creosotebush, skeletonleaf goldeneye, other shrubs, range ratany, ocotillo, lechuguilla

Rock outcrop

Landforms: Ridges on hills, free faces on hills,
Geomorphic positions, two-dimensional: Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Limestone and/or chert

Typical Profile

R—0 to 10 inches; chert bedrock

Properties and Qualities

Slope: 30 to 60 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

CIC—Chilicotal very gravelly fine sandy loam, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
Chilicotal and similar soils: 80 percent
Minor components: 20 percent
Gemelo soils have a coarse-loamy control section and occur on lower foot or toe slopes: 10 percent
Straddlebug soils have a fine-loamy control section and occur on lower foot or toe slopes: 10 percent

Major Component Descriptions

Chilicotal

Landforms: Fan remnants (fig. 18)
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous rock

Figure 18.—Grass recovery following chemical brush management on an area of Chilicotal very gravelly fine sandy loam, 1 to 8 percent slopes. Chilicotal soils are on fan remnants and relict alluvial fans.

Typical Profile

A—0 to 2 inches; moderately alkaline very gravelly fine sandy loam
Bw—2 to 7 inches; moderately alkaline very gravelly loam
Bk1—7 to 40 inches; moderately alkaline very gravelly and extremely gravelly loam
Bk2—40 to 80 inches; moderately alkaline very gravelly and extremely gravelly sandy loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 12 percent subrounded cobbles, about 78 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 5.4 inches (low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

CID—Chilicotal very gravelly fine sandy loam, 5 to 16 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
Chilicotal and similar soils: 80 percent
Minor components: 20 percent
Gemelo soils have a coarse-loamy control section and occur on lower foot or toe slopes: 10 percent
Straddlebug soils have a fine-loamy control section and occur on lower foot or toe slopes: 10 percent

Major Component Descriptions

Chilicotal

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous rock

Typical Profile

A—0 to 2 inches; moderately alkaline very gravelly fine sandy loam
Bw—2 to 7 inches; moderately alkaline very gravelly loam
Bk1—7 to 40 inches; moderately alkaline very gravelly and extremely gravelly loam
Bk2—40 to 80 inches; moderately alkaline very gravelly and extremely gravelly sandy loam

Properties and Qualities

Slope: 5 to 16 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 9 percent subrounded cobbles, about 80 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 5.4 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

CLC—Chilicotal and Paisano soils, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 93 percent
Chilicotal and similar soils: 61 percent
Paisano and similar soils: 32 percent
Minor components: 7 percent
Unnamed soils occur throughout the unit: 7 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Chilicotal

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous rock

Typical Profile

A—0 to 9 inches; moderately alkaline gravelly sandy loam
Bk1—9 to 16 inches; moderately alkaline very gravelly loam
Bk2—16 to 80 inches; moderately alkaline very cobbly loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 12 percent subrounded cobbles, about 78 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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: Sodic
Representative total available water capacity to 60 inches: About 5.5 inches (low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

Paisano

Landforms: Fan remnants

Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous rock

Typical Profile

A—0 to 5 inches; moderately alkaline very gravelly fine sandy loam
Bk—5 to 18 inches; moderately alkaline extremely gravelly loam
Bkkm—18 to 31 inches; cemented material
BCk—31 to 80 inches; moderately alkaline very gravelly sandy loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel
Depth to first restrictive layer: 5 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.4 inches (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

CMC—Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 90 percent
Chilimol and similar soils: 45 percent
Boracho and similar soils: 32 percent
Berrend and similar soils: 13 percent
Minor components: 10 percent
Unnamed soils occur throughout the unit: 10 percent

Major Component Descriptions

Chilimol

Landforms: Fan piedmonts (fig. 19)
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous rock

Typical Profile

A—0 to 10 inches; moderately alkaline very gravelly loam
Bk—10 to 80 inches; moderately alkaline very gravelly loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 15 percent subrounded cobbles
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline

Figure 19.—Chilimol soils in an area of Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes. Chilimol soils are on fan piedmonts in intermontane basins.

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: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Gravelly, Mixed Prairie
Ecological site number: R042XE275TX
Typical vegetation: Other perennial grasses, sideoats grama, black grama, blue grama, cane bluestem, plains bristlegrass, green sprangletop, plains lovegrass, other perennial forbs, other shrubs, javelinabush

Boracho

Landforms: Fan piedmonts
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous rock

Typical Profile

A—0 to 6 inches; moderately alkaline extremely gravelly sandy loam
Bk—6 to 12 inches; moderately alkaline extremely gravelly sandy loam
Bkkm—12 to 25 inches; cemented material
BCk—25 to 80 inches; moderately alkaline extremely gravelly sandy loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 40 percent subrounded gravel, about 10 percent subrounded cobbles
Depth to first restrictive layer: 7 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.0 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other

perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

Berrend

Landforms: Fan piedmonts
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Loamy alluvium derived from igneous rock

Typical Profile

A—0 to 2 inches; neutral loam
Bt—2 to 19 inches; moderately alkaline clay loam
Btk—19 to 51 inches; moderately alkaline clay loam
C—51 to 80 inches; moderately alkaline fine sandy loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 1 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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 11 inches (high)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Loamy Slope, Mixed Prairie
Ecological site number: R042XE694TX
Typical vegetation: Black grama, blue grama, sideoats grama, other perennial grasses, other shrubs, cane bluestem, bristlegrass, other forbs, sand muhly, sand dropseed, spiderling grass, Ephedra, woolly butterflybush, soaptree yucca

CND—Chinati-Boracho-Berrend association, 1 to 15 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 85 percent
Chinati and similar soils: 54 percent
Boracho and similar soils: 19 percent

Berrend and similar soils: 12 percent
Minor components: 15 percent
Chilimol are very deep to bedrock, do not have a petrocalcic horizon, and occur on lower side and footslopes: 7 percent
Eppenauer soils are moderately deep to bedrock, do not have a calcic or petrocalcic horizon, and occur on slightly higher summits: 7 percent
Marfa soils have a fine textured control section, are very deep to bedrock, and occur on lower drainageways: 1 percent

Major Component Descriptions

Chinati

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Shoulder, backslope, footslope
Geomorphic positions, three-dimensional: Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or residuum weathered from fanglomerate

Typical Profile

A—0 to 3 inches; slightly alkaline very gravelly loam
Bt—3 to 12 inches; slightly alkaline very gravelly loam
Bkkm—12 to 21 inches; cemented material
R—21 to 47 inches; fanglomerate bedrock

Properties and Qualities

Slope: 1 to 15 percent
Percent of area covered by surface fragments: About 30 percent subrounded gravel, about 20 percent subrounded cobbles, about 10 percent subrounded stones
Depth to first restrictive layer: 8 to 20 inches to bedrock, petrocalcic; 20 to 40 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.0 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

Boracho

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous rock

Typical Profile

A—0 to 4 inches; moderately alkaline very gravelly clay loam
Bk—4 to 12 inches; moderately alkaline extremely cobbly clay loam
Bkkm—12 to 25 inches; cemented material
BCk—25 to 80 inches; moderately alkaline extremely gravelly sandy clay loam

Properties and Qualities

Slope: 1 to 15 percent
Percent of area covered by surface fragments: About 30 percent subrounded gravel, about 2 percent subrounded cobbles
Depth to first restrictive layer: 7 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.0 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

Berrend

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Loamy alluvium derived from igneous rock

Typical Profile

A—0 to 4 inches; neutral sandy loam
Bt—4 to 20 inches; moderately alkaline sandy clay loam

Btk—20 to 39 inches; moderately alkaline sandy clay loam
C—39 to 80 inches; moderately alkaline fine sandy loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 4 percent subrounded gravel, about 1 percent subrounded cobbles
Depth to first restrictive layer: No restrictive layer
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 7.5 inches (moderate)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Loamy Slope, Mixed Prairie
Ecological site number: R042XE694TX
Typical vegetation: Black grama, blue grama, sideoats grama, other perennial grasses, other shrubs, cane bluestem, bristlegrass, other forbs, sand muhly, sand dropseed, spiderling grass, Ephedra, woolly butterflybush, soaptree yucca

CNE—Chinati-Boracho complex, 5 to 20 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 80 percent
- Chinati and similar soils: 50 percent
- Boracho and similar soils: 30 percent

Minor components: 20 percent
- Sanmoss are very deep to bedrock, do not have a calcic or petrocalcic horizon, and occur on lower side and footslopes: 10 percent
- Chilimol are very deep to bedrock, do not have a petrocalcic horizon, and occur on lower side and footslopes: 7 percent
- Murray soils have a fine-loamy control section, are very deep to bedrock, and occur on slightly higher summits: 3 percent

Major Component Descriptions

Chinati

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Shoulder, backslope, footslope

Geomorphic positions, three-dimensional: Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or residuum weathered from fanglomerate

Typical Profile

A—0 to 5 inches; slightly alkaline very gravelly fine sandy loam
Bt—5 to 9 inches; slightly alkaline extremely gravelly sandy clay loam
Bkkm—9 to 29 inches; cemented material
R—29 to 40 inches; fanglomerate bedrock

Properties and Qualities

Slope: 5 to 20 percent
Percent of area covered by surface fragments: About 25 percent subrounded gravel, about 15 percent subrounded cobbles, about 5 percent subrounded stones
Depth to first restrictive layer: 8 to 20 inches to bedrock, petrocalcic; 20 to 40 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

Boracho

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Crest, interfluve
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Gravelly alluvium derived from igneous rock

Typical Profile

A—0 to 9 inches; moderately alkaline very gravelly loam
Bkkm—9 to 20 inches; cemented material
BCk—20 to 80 inches; moderately alkaline extremely gravelly sandy clay loam

Properties and Qualities

Slope: 5 to 16 percent
Percent of area covered by surface fragments: About 70 percent subrounded gravel, about 10 percent subrounded cobbles
Depth to first restrictive layer: 7 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.9 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

COC—Corazones-Ojinaga complex, 1 to 12 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 90 percent
Corazones and similar soils: 50 percent
Ojinaga and similar soils: 40 percent
Minor components: 10 percent
Baviza soils have a sandy control section and occur on lower footslopes: 5 percent
Geefour soils have a clayey control section, shallow to bedrock, and occur on lower side slopes: 5 percent

Major Component Descriptions

Corazones

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 2 inches; moderately alkaline gravelly sandy loam
Bk1—2 to 25 inches; moderately alkaline very gravelly sandy loam and extremely gravelly sandy loam
Bk2—25 to 80 inches; moderately alkaline extremely gravelly loamy coarse sand

Properties and Qualities

Slope: 1 to 12 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 3 percent subrounded cobbles, about 70 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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 2.8 inches (very low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, creosotebush, other forbs, feather pappusgrass, triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg's coldenia

Ojinaga

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 6 inches; strongly alkaline very gravelly sandy loam
Bk—6 to 12 inches; moderately alkaline very gravelly coarse sandy loam
Bkkm—12 to 22 inches; cemented material
BCk—22 to 49 inches; strongly alkaline extremely gravelly loamy coarse sand
CBk—49 to 69 inches; moderately alkaline extremely gravelly coarse sandy loam
C—69 to 80 inches; moderately alkaline extremely gravelly loamy coarse sand

Properties and Qualities

Slope: 1 to 12 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 4 percent subrounded cobbles, about 85 percent subrounded gravel

Depth to first restrictive layer: 4 to 15 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, creosotebush, other forbs, feather pappusgrass, triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg's coldenia

COE—Corazones-Ojinaga complex, 10 to 40 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 87 percent
Corazones and similar soils: 61 percent
Ojinaga and similar soils: 26 percent
Minor components: 13 percent
Redford soils are shallow to bedrock and occur on similar positions: 9 percent
Unnamed soils occur throughout the unit: 4 percent

Major Component Descriptions

Corazones

Landforms: Fan remnants (fig. 20)
Geomorphic positions, two-dimensional: Backslope, footslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly fine sandy loam
Bk1—3 to 43 inches; moderately alkaline very gravelly fine sandy loam
Bk2—43 to 80 inches; moderately alkaline extremely gravelly loamy coarse sand

Figure 20.—An area of Corazones-Ojinaga complex, 10 to 40 percent slopes. Both these soils occur on fan remnants. The Corazones soils are on the side slopes and backslopes. Ojinaga soils are on the summits and ridges.

Properties and Qualities

Slope: 10 to 40 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 20 percent subrounded cobbles, about 5 percent subrounded stones
Depth to first restrictive layer: No restrictive layer
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 4.1 inches (low)*Natural drainage class:* Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7e
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, creosotebush, other forbs, feather pappusgrass, triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg's coldenia

Ojinaga

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, shoulder, backslope (fig. 20)
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 2 inches; strongly alkaline very gravelly loam
Bk—2 to 16 inches; moderately alkaline very gravelly loam
Bkkm—16 to 28 inches; cemented material
BCk—28 to 80 inches; strongly alkaline extremely gravelly loam

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 20 percent subrounded cobbles, about 5 percent subrounded stones
Depth to first restrictive layer: 6 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.7 inches (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, creosotebush, other forbs, feather pappusgrass, triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg's coldenia

CVC—Costavar and Volco soils, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 72 percent
Costavar and similar soils: 53 percent

Volco and similar soils: 19 percent
Minor components: 28 percent
Pardo soils have a petrocalcic horizon and occur on similar positions: 14 percent
Berrend soils have a fine-loamy control section, are very deep to bedrock, and occur on lower footslopes: 11 percent
Chilimol soils are very deep to bedrock and occur on lower side slopes and footslopes: 3 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Costavar

Landforms: Hills
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from basalt and/or ignimbrite

Typical Profile

A—0 to 4 inches; neutral gravelly sandy clay loam
Bt—4 to 13 inches; neutral very gravelly sandy clay loam
R—13 to 23 inches; basalt bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 2 percent angular stones, about 11 percent angular cobbles, about 63 percent angular gravel
Depth to first restrictive layer: 4 to 18 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.2 inches (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Basalt Hill, Mixed Prairie
Ecological site number: R042XE695TX
Typical vegetation: Black grama, sideoats grama, blue grama, other perennial grasses, other perennial forbs, tanglehead, cane bluestem, plains lovegrass, wolftail, Arizona cottontop, other shrubs, sacahuista, javelinabush, feather dalea

Volco

Landforms: Hills
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from basalt and/or ignimbrite

Typical Profile

A—0 to 2 inches; moderately alkaline very gravelly loam
Bk—2 to 9 inches; moderately alkaline extremely cobbly loam
R—9 to 22 inches; ignimbrite bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 2 percent angular stones, about 11 percent angular cobbles, about 63 percent angular gravel
Depth to first restrictive layer: 6 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.5 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Basalt Hill, Mixed Prairie
Ecological site number: R042XE695TX
Typical vegetation: Black grama, sideoats grama, blue grama, other perennial grasses, other perennial forbs, tanglehead, cane bluestem, plains lovegrass, wolftail, Arizona cottontop, other shrubs, sacahuista, javelinabush, feather dalea

EEB—Espy-Eppenauer complex, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 95 percent
Espy and similar soils: 56 percent
Eppenauer and similar soils: 39 percent

Minor components: 5 percent
Marfa soils have a fine textured control section and occur in lower drainages: 3 percent
Musquiz soils have a fine textured control section, an argillic horizon, and occur on slightly lower positions: 2 percent

Major Component Descriptions

Espy

Landforms: Fan piedmonts
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from tuffaceous sandstone

Typical Profile

A—0 to 4 inches; moderately alkaline fine sandy loam
Bk—4 to 16 inches; moderately alkaline fine sandy loam
Bkkm—16 to 22 inches; cemented material
BCk—22 to 39 inches; moderately alkaline fine sandy loam
2C—39 to 80 inches; moderately alkaline loamy sand

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 4 percent rounded gravel, about 1 percent rounded cobbles
Depth to first restrictive layer: 10 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.9 inches (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

Eppenauer

Landforms: Fan piedmonts
Geomorphic positions, two-dimensional: Footslope, toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear

Across-slope shape: Concave, linear
Parent material: Loamy alluvium over tuffaceous sandstone

Typical Profile

A—0 to 5 inches; slightly alkaline fine sandy loam
Bt—5 to 10 inches; moderately alkaline sandy clay loam
Btk—10 to 18 inches; moderately alkaline sandy clay loam
Bk—18 to 23 inches; moderately alkaline loam
Cr—23 to 40 inches; sandstone bedrock

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 4 percent rounded gravel, about 1 percent rounded cobbles
Depth to first restrictive layer: 20 to 40 inches to bedrock, paralithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 3.5 inches (low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Loamy Slope, Mixed Prairie
Ecological site number: R042XE694TX
Typical vegetation: Black grama, blue grama, sideoats grama, other perennial grasses, other shrubs, cane bluestem, bristlegrass, other forbs, sand muhly, sand dropseed, spiderling grass, Ephedra, woolly butterflybush, soaptree yucca

GAA—Galindo clay, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: River valleys
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 76 percent
Galindo and similar soils: 76 percent
Minor components: 24 percent
Castolon soils have a fine-silty control section and occur on similar positions: 11 percent

Lomapelona soils have a coarse-loamy control section and occur on similar positions: 11 percent
Unnamed hydric soils occur on slightly lower positions: 2 percent

Major Component Descriptions

Galindo

Landforms: Flood plains
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Holocene age clayey alluvium

Typical Profile

Ap—0 to 12 inches; moderately alkaline clay
C1—12 to 29 inches; moderately alkaline clay
2C2—29 to 48 inches; moderately alkaline very fine sandy loam
2C3—48 to 80 inches; moderately alkaline fine sand

Properties and Qualities

Slope: 0 to 1 percent
Percent of area covered by surface fragments: About 1 percent rounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (slow)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: 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: Moderately well drained
Runoff: Low
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: 2w
Ecological site name: Loamy Bottomland, Hot Desert Shrub
Ecological site number: R042XG733TX
Typical vegetation: Giant sacaton, alkali sacaton, other shrubs, other perennial grasses, other trees, fourwing saltbush, tarbush, cottonwood, cane bluestem, sideoats grama, false Rhodes grass, western honey mesquite, plains bristlegrass, white triden, pink pappusgrass, other perennial forbs, spiny aster, other annual forbs.

GEF—Geefour silty clays complex, 10 to 45 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches

Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 80 percent
Geefour and similar soils: 45 percent
Geefour eroded and similar soils: 35 percent
Minor components: 20 percent
Unnamed soils occur throughout the unit: 10 percent
Corazones soils formed in deep, gravelly alluvial fan sediments and occur on higher summit or side slopes: 5 percent
Solis soils have a loamy control section and occur on higher positions: 5 percent

Major Component Descriptions

Geefour

Landforms: Erosion remnants
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly colluvium over clayey residuum weathered from mudstone

Typical Profile

A1—0 to 2 inches; moderately alkaline very gravelly silty clay
A2—2 to 7 inches; moderately alkaline clay
Cd—7 to 20 inches; moderately alkaline densic material that has a texture of silty clay

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 50 percent subrounded gravel, about 20 percent subrounded cobbles, about 0 percent subrounded stones
Depth to first restrictive layer: 5 to 20 inches to bedrock, densic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 0.06 to 0.2 in/hr (slow)
Salinity, representative within 40 inches: Saline
Salinity, maximum within 40 inches: Saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 1.0 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Salty Clay Hill, Hot Desert Shrub
Ecological site number: R042XG734TX
Typical vegetation: Tobosa, alkali sacaton, other perennial forbs, other shrubs, false grama, whorled dropseed, Hall's panicum, western honey mesquite, tubercled saltbush, wolfberry, creosotebush, other perennial grasses, fluffgrass, mound saltbush

Geefour soils, eroded

Landforms: Erosion remnants
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Clayey residuum weathered from mudstone

Typical Profile

A—0 to 2 inches; moderately alkaline silty clay
C—2 to 7 inches; moderately alkaline clay
Cd—7 to 20 inches; moderately alkaline densic material that has a texture of silty clay

Properties and Qualities

Slope: 10 to 45 percent
Percent of area covered by surface fragments: About 2 percent subrounded gravel
Depth to first restrictive layer: 5 to 20 inches to bedrock, densic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 0.06 to 0.2 in/hr (slow)
Salinity, representative within 40 inches: Saline
Salinity, maximum within 40 inches: Saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 1.0 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Not assigned
Ecological site number: Not assigned

GFF—Geefour-Corazones-Ojinaga association, 5 to 45 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 87 percent
Geefour and similar soils: 53 percent
Corazones and similar soils: 21 percent
Ojinaga and similar soils: 13 percent
Minor components: 13 percent
Unnamed soils occur throughout the unit: 13 percent

Major Component Descriptions

Geefour

Landforms: Erosion remnants
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly colluvium over clayey residuum weathered from mudstone

Typical Profile

A—0 to 11 inches; moderately alkaline clay
Cd—11 to 20 inches; moderately alkaline densic material that has a texture of clay

Properties and Qualities

Slope: 5 to 45 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 10 percent subrounded cobbles, about 0 percent subrounded stones
Depth to first restrictive layer: 5 to 20 inches to bedrock, densic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 0.06 to 0.2 in/hr (slow)
Salinity, representative within 40 inches: Saline
Salinity, maximum within 40 inches: Saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 1.4 inches (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Salty Clay Hill, Hot Desert Shrub
Ecological site number: R042XG734TX
Typical vegetation: Tobosa, alkali sacaton, other forbs, other shrubs, false grama, whorled dropseed, Hall's panicum, western honey mesquite, tubercled saltbush, wolfberry, creosotebush, other perennial grasses, fluffgrass, mound saltbush

Corazones

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Backslope, footslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 9 inches; moderately alkaline very gravelly sandy loam
Bk1—9 to 48 inches; moderately alkaline very cobbly sandy loam
Bk2—48 to 80 inches; moderately alkaline extremely gravelly loamy coarse sand

Properties and Qualities

Slope: 5 to 45 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 3 percent subrounded cobbles, about 70 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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 4.3 inches (low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7e
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, creosotebush, other forbs, feather pappusgrass, triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg's coldenia

Ojinaga

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 4 inches; strongly alkaline very gravelly sandy loam
Bk—4 to 15 inches; moderately alkaline very gravelly sandy loam
Bkkm—15 to 22 inches; cemented material
BCk—22 to 49 inches; strongly alkaline extremely gravelly loamy coarse sand
CBk—49 to 69 inches; moderately alkaline extremely gravelly coarse sandy loam
C—69 to 80 inches; moderately alkaline extremely gravelly loamy coarse sand

Properties and Qualities

Slope: 5 to 15 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 3 percent subrounded cobbles, about 70 percent subrounded gravel
Depth to first restrictive layer: 6 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.0 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, creosotebush, other forbs, feather pappusgrass, triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg's coldenia

GMF—Geefour-Melado complex, 5 to 45 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 80 percent
- Geefour and similar soils: 49 percent
- Melado and similar soils: 31 percent

Minor components: 20 percent
- Corazones soils formed in deep, gravelly alluvial fan sediments and occur on higher summit or side slopes: 9 percent
- Ojinaga soils formed in deep, gravelly alluvial fan sediments, have a petrocalcic horizon, and occur on higher summits or ridge tops: 5 percent
- Badland: 3 percent
- Unnamed soils occur throughout the unit: 3 percent

Major Component Descriptions

Geefour

Landforms: Erosion remnants (fig. 21)
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gypsiferous clayey lacustrine deposits

Typical Profile

A—0 to 5 inches; moderately alkaline clay
Byz—5 to 18 inches; strongly alkaline clay
Cdy—18 to 28 inches; strongly alkaline densic material that has a texture of clay

Properties and Qualities

Slope: 5 to 45 percent
Depth to first restrictive layer: 10 to 20 inches to bedrock, densic

Figure 21.—Geefour soils (background) in an area of Geefour-Melado complex, 5 to 45 percent slopes. Geefour soils occur on erosion remnants associated with bolsons.

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (very slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 2.0 inches (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Salty Clay Hill, Hot Desert Shrub
Ecological site number: R042XG734TX
Typical vegetation: Tobosa, alkali sacaton, other forbs, other shrubs, false grama, whorled dropseed, Hall's panicum, western honey mesquite, tubercled saltbush, wolfberry, creosotebush, other perennial grasses, fluffgrass, mound saltbush

Melado

Landforms: Alluvial flats
Geomorphic positions, two-dimensional: Footslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium derived from gypsiferous, saline lacustrine deposits

Typical Profile

A—0 to 3 inches; moderately alkaline silty clay
Bnyz—3 to 37 inches; moderately alkaline clay
Cnyz—37 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 5 to 12 percent
Depth to first restrictive layer: No restrictive layer
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 3.9 inches (low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Salty Clay Fan, Hot Desert Shrub (fig. 22)
Ecological site number: R042XG747TX
Typical vegetation: Creosotebush, western honey mesquite, tubercled saltbush, fourwing saltbush, alkali sacaton, tobosa, annual grasses, other annual forbs, other shrubs, other perennial forbs

GSA—Gemelo-Straddlebug complex, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
Gemelo and similar soils: 60 percent
Straddlebug and similar soils: 25 percent
Minor components: 15 percent
Chilicotal soils have a loamy-skeletal control section and occur on higher side slopes or ridges: 10 percent

Figure 22.—Creosotebush, western honey mesquite, and tubercled saltbush on Melado silty clay in an area of Geefour-Melado complex, 5 to 45 percent slopes. Melado soils are in the Salty Clay Fan ecological site, Hot Desert Shrub vegetative zone.

Butcherknife soils have a fine textured control section and occur on lower positions: 5 percent

Major Component Descriptions

Gemelo

Landforms: Fan aprons
Geomorphic positions, two-dimensional: Footslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Loamy alluvium derived from tuff

Typical Profile

A—0 to 6 inches; moderately alkaline gravelly fine sandy loam
Bn—6 to 14 inches; moderately alkaline fine sandy loam
Bkn1—14 to 25 inches; moderately alkaline very gravelly fine sandy loam
Bkn2—25 to 36 inches; strongly alkaline fine sandy loam
Bkn3—36 to 54 inches; very strongly alkaline very gravelly fine sandy loam
BCkn—54 to 80 inches; very strongly alkaline gravelly sandy loam

Properties and Qualities

Slope: 1 to 3 percent
Percent of area covered by surface fragments: About 25 percent subangular gravel
Depth to first restrictive layer: No restrictive layer

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: Sodic
Representative total available water capacity to 60 inches: About 5.4 inches (low)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

Straddlebug

Landforms: Inset fans, alluvial flats
Geomorphic positions, two-dimensional: Footslope, toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from tuff

Typical Profile

A1—0 to 4 inches; moderately alkaline silty clay loam
A2—4 to 11 inches; moderately alkaline clay
Bnb—11 to 18 inches; moderately alkaline clay
Bknb1—18 to 26 inches; moderately alkaline clay loam
Bknb2—26 to 33 inches; moderately alkaline sandy clay loam
Bknb3—33 to 58 inches; moderately alkaline fine sandy loam
Bknb4—58 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 1 to 3 percent
Percent of area covered by surface fragments: About 5 percent subangular gravel
Depth to first restrictive layer: No restrictive layer
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: Sodic
Representative total available water capacity to 60 inches: About 8.9 inches (moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Loamy, Desert Grassland

Ecological site number: R042XC250TX
Typical vegetation: Blue grama, black grama, burrograss, other perennial grasses, tobosa, sideoats grama, other forbs, Arizona cottontop, plains bristlegrass, bush muhly, cane bluestem, other shrubs, tarbush

HOB—Holguin very gravelly fine sandy loam, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
Holguin and similar soils: 85 percent
Minor components: 15 percent
Unnamed soils occur throughout the unit: 10 percent
Rock outcrop: 5 percent

Major Component Descriptions

Holguin

Landforms: Hills
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from tuff

Typical Profile

A—0 to 5 inches; moderately alkaline very gravelly fine sandy loam
R—5 to 15 inches; tuff bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 2 percent subangular boulders, about 5 percent subangular stones, about 10 percent subangular cobbles, about 40 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

HOD—Horsetrap-Bofecillos-Rock outcrop complex, 1 to 12 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 95 percent
Horsetrap and similar soils: 62 percent
Bofecillos and similar soils: 33 percent
Minor components: 5 percent
Pantak soils have an argillic horizon and occur on similar positions: 5 percent

Major Component Descriptions

Horsetrap

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Mountaintop, mountainflank, interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly slope alluvium and/or residuum weathered from basalt

Typical Profile

A—0 to 4 inches; slightly alkaline gravelly sandy clay loam
Bk—4 to 13 inches; moderately alkaline very gravelly sandy clay loam
R—13 to 23 inches; basalt bedrock

Properties and Qualities

Slope: 1 to 12 percent
Percent of area covered by surface fragments: About 50 percent subangular gravel, about 5 percent subangular cobbles
Depth to first restrictive layer: 10 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: Moderate (0.6 to 2.0 in/hr)
Slowest permeability from first cemented restrictive layer to 60 inches: Moderate (0.6 to 2.0 in/hr)
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 1.2 inches (very low)

Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability, nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Bofecillos

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Mountaintop, mountainflank, interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from basalt

Typical Profile

A—0 to 4 inches; slightly alkaline very gravelly sandy clay loam
R—4 to 14 inches; basalt bedrock

Properties and Qualities

Slope: 1 to 12 percent
Percent of area covered by surface fragments: About 75 percent subangular gravel, about 5 percent subangular cobbles
Depth to first restrictive layer: 2 to 10 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: Moderately slow (0.2 to 0.6 in/hr)
Slowest permeability from first cemented restrictive layer to 60 inches: Moderately slow (0.2 to 0.6 in/hr)
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 0.3 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Rock outcrop

Landforms: Ledges on hills, free faces on hills, ledges on mountains, free faces on mountains
Geomorphic positions, three-dimensional: Mountainflank, free face
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Basalt

Typical Profile

R—0 to 10 inches; basalt bedrock

Properties and Qualities

Slope: 12 to 60 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

KIB—Kinco gravelly sandy loam, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
Kinco and similar soils: 80 percent
Minor components: 20 percent
Chispa soils have a fine-loamy control section and occur on similar positions: 10 percent
Straddlebug soils have a fine-loamy control section and occur on lower positions: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Major Component Descriptions

Kinco

Landforms: Alluvial flats
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 4 inches; moderately alkaline gravelly sandy loam
Bw—4 to 16 inches; moderately alkaline sandy loam
Bk1—16 to 26 inches; moderately alkaline gravelly sandy loam
Bk2—26 to 80 inches; moderately alkaline gravelly fine sandy loam

Properties and Qualities

Slope: 0 to 3 percent
Depth to first restrictive layer: No restrictive layer
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 6.5 inches (moderate)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Sandy Loam, Desert Grassland
Ecological site number: R042XC256TX
Typical vegetation: Black grama, other perennial grasses, sideoats grama, sand dropseed, spike dropseed, other forbs, other shrubs, bush muhly, plains bristlegrass, Arizona cottontop, mesa dropseed, fourwing saltbush, creosotebush

LGC—Lingua very gravelly loam, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 70 percent
- Lingua and similar soils: 70 percent

Minor components: 30 percent
- Chilicotal soils are very deep to bedrock, have a calcic horizon, and occur on lower footslopes: 10 percent
- Rock outcrop: 10 percent
- Scotal soils are calcareous, formed in tuff bedrock, and occur on lower side slopes: 10 percent

Major Component Descriptions

Lingua

Landforms: Mountains, hills
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from basalt

Typical Profile

A—0 to 8 inches; slightly alkaline very gravelly loam
R—8 to 18 inches; basalt bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 75 percent subangular gravel, about 5 percent subangular cobbles
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

LIF—Lingua-Ohtwo complex, 20 to 45 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
- Lingua and similar soils: 55 percent
- Ohtwo and similar soils: 30 percent

Minor components: 15 percent
- Chilicotal soils are very deep to bedrock, have a calcic horizon, and occur on lower footslopes: 5 percent
- Gemelo soils are very deep to bedrock, have a coarse-loamy control section, and occur on lower footslopes: 5 percent
- Reduff soils formed in reddish tuff bedrock and occur on lower side slopes: 5 percent

Major Component Descriptions

Lingua

Landforms: Escarpments
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from basalt

Typical Profile

A—0 to 8 inches; slightly alkaline very gravelly sandy clay loam
R—8 to 18 inches; basalt bedrock

Properties and Qualities

Slope: 20 to 45 percent
Percent of area covered by surface fragments: About 75 percent subangular gravel, about 5 percent subangular cobbles
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.6 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Ohtwo

Landforms: Talus slopes on escarpments
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly colluvium derived from tuff and/or basalt

Typical Profile

A—0 to 8 inches; slightly alkaline very gravelly clay loam
Bk1—8 to 35 inches; slightly alkaline very gravelly clay loam
Bk2—35 to 42 inches; slightly alkaline very cobbly loam
Bk3—42 to 65 inches; slightly alkaline very gravelly loam
R—65 to 75 inches; tuffaceous bedrock

Properties and Qualities

Slope: 20 to 45 percent
Percent of area covered by surface fragments: About 65 percent subangular gravel
Depth to first restrictive layer: 60 to 80 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 5.8 inches (low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7e
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

MAE—Manzanillo and Paisano soils, 1 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 95 percent
Manzanillo and similar soils: 65 percent
Paisano and similar soils: 30 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Manzanillo

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Gravelly alluvium and/or residuum weathered from fanglomerate

Typical Profile

A—0 to 2 inches; slightly alkaline very gravelly fine sandy loam
Bk—2 to 13 inches; slightly alkaline extremely gravelly sandy clay loam
Bkkm—13 to 16 inches; cemented material
R—16 to 22 inches; fanglomerate bedrock

Properties and Qualities

Slope: 1 to 30 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 5 percent subrounded cobbles
Depth to first restrictive layer: 4 to 18 inches to bedrock, petrocalcic; 10 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.5 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

Paisano

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly loam
Bk—3 to 12 inches; moderately alkaline very gravelly loam
Bkkm—12 to 18 inches; cemented material
BCk—18 to 80 inches; moderately alkaline very gravelly sandy loam

Properties and Qualities

Slope: 1 to 20 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 5 percent subrounded cobbles

Depth to first restrictive layer: 5 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.4 inches (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

MBE—Manzanillo-Chilicotal-Holguin association, 1 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
- Manzanillo and similar soils: 40 percent
- Chilicotal and similar soils: 25 percent
- Holguin and similar soils: 20 percent

Minor components: 15 percent
- Nolam soils are very deep to bedrock, have an argillic horizon, and occur on summits of ridges: 5 percent
- Paisano soils are very deep to bedrock, shallow to a petrocalcic horizon, and occur on summits and shoulder slopes of ridges: 5 percent
- Unnamed soils occur throughout the unit: 5 percent

Major Component Descriptions

Manzanillo

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or residuum weathered from fanglomerate

Typical Profile

A—0 to 2 inches; slightly alkaline gravelly sandy loam
Bk—2 to 13 inches; slightly alkaline extremely gravelly sandy clay loam
Bkkm—13 to 16 inches; cemented material
R—16 to 22 inches; fanglomerate bedrock

Properties and Qualities

Slope: 1 to 30 percent
Percent of area covered by surface fragments: About 5 percent subrounded cobbles, about 75 percent subrounded gravel
Depth to first restrictive layer: 4 to 18 inches to bedrock, petrocalcic; 10 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.8 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

Chilicotal

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline extremely gravelly sandy clay loam
Bk1—3 to 24 inches; moderately alkaline extremely gravelly sandy clay loam
Bk2—24 to 80 inches; strongly alkaline extremely gravelly sandy clay loam

Properties and Qualities

Slope: 1 to 30 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 9 percent subrounded cobbles, about 80 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer

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 3.6 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

Holguin

Landforms: Dissected pediments
Geomorphic positions, two-dimensional: Backslope, footslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from tuff and/or volcanic sandstone

Typical Profile

A—0 to 2 inches; moderately alkaline very gravelly fine sandy loam
BCk—2 to 5 inches; moderately alkaline extremely gravelly fine sandy loam
R—5 to 15 inches; tuff bedrock

Properties and Qualities

Slope: 1 to 20 percent
Percent of area covered by surface fragments: About 2 percent subangular boulders, about 5 percent subangular stones, about 10 percent subangular cobbles, about 40 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.3 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX

Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

MCA—Marfa clay loam, 0 to 2 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 92 percent
Marfa and similar soils: 92 percent
Minor components: 8 percent
Medley soils have a fine-loamy control section and occur on similar positions: 4 percent
Berrend soils have a fine-loamy control section, an argillic horizon, and occur on slightly higher positions: 2 percent
Murray soils have a fine-loamy control section, a calcic horizon, and occur on slightly higher positions: 2 percent

Major Component Descriptions

Marfa

Landforms: Flood plains
Geomorphic positions, two-dimensional: Summit, toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Loamy and clayey alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 4 inches; slightly acid clay loam
Bt1—4 to 24 inches; neutral clay loam and clay
Bt2—24 to 41 inches; slightly alkaline clay
2Btk—41 to 69 inches; moderately alkaline loam and fine sandy loam
2Bk—69 to 80 inches; moderately alkaline loamy fine sand

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 1 percent rounded gravel
Depth to first restrictive layer: No restrictive layer
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 9.2 inches (high)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Loamy Swale, Mixed Prairie (fig. 23)
Ecological site number: R042XE279TX
Typical vegetation: Blue grama, sideoats grama, cane bluestem, vine mesquite, bristlegrass, tobosa, other forbs, Swallen's curly mesquite, buffalograss, sand muhly, other shrubs, bundleflower, woolly butterflybush, other perennial grasses

MDE—Mariscal-Rock outcrop complex, 10 to 30 percent slopes

Setting

Major land resource area: MLRA 81D—Southern Edwards Plateau
Landscape: Hills
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 95 percent
Mariscal and similar soils: 80 percent
Rock outcrop and similar soils: 15 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Figure 23.—Blue grama, cane bluestem, and javelinabush on an area of Marfa clay loam, 0 to 2 percent slopes, occasionally flooded. Marfa soils are in the Loamy Swale ecological site, Mixed Prairie vegetative zone.

Major Component Descriptions

Mariscal

Landforms: Hills
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery residuum and/or colluvium derived from limestone

Typical Profile

A and Ak—0 to 5 inches; moderately alkaline extremely channery loam
Rk and R—5 to 15 inches; limestone bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 15 percent subangular flagstones, about 60 percent subangular channers, about 1 percent subangular stones
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Flagstone Hill 8-14" PZ
Ecological site number: R081DY295TX
Typical vegetation: Chino grama, other perennial grasses, triden, threeawn, black grama, other perennial forbs, other shrubs, desert myrtlecroton, skeletonleaf goldeneye, guayacan, cenizo, feathery dalea, creosotebush, candelilla

Rock outcrop

Landforms: Ledges on hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 10 to 30 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

MOA—Martillo and Butcherknife soils, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
- Martillo and similar soils: 60 percent
- Butcherknife and similar soils: 25 percent

Minor components: 15 percent
- Borunda soils are less than 40 inches deep to bedrock and occur on slightly higher positions: 5 percent
- Straddlebug soils have a fine-loamy control section and occur on higher foot and toe slopes: 5 percent
- Unnamed soils occur throughout the unit: 5 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Martillo

Landforms: Alluvial flats, fans skirts
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium derived from tuff

Typical Profile

A—0 to 4 inches; moderately alkaline clay loam
Bn—4 to 23 inches; moderately alkaline clay
2Bnz—23 to 34 inches; moderately alkaline loam
2Bknz—34 to 55 inches; moderately alkaline loam
2Bn’1—55 to 64 inches; moderately alkaline loam

3Bn’2—64 to 72 inches; moderately alkaline clay loam
3CBkn—72 to 80 inches; moderately alkaline silty clay loam

Properties and Qualities

Slope: 0 to 3 percent
Depth to first restrictive layer: No restrictive layer
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: 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: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Clay Flat, Desert Grassland
Ecological site number: R042XC241TX
Typical vegetation: Tobosa, vine mesquite, blue grama, cane bluestem, sideoats grama, alkali sacaton, other forbs, other perennial grasses, ear muhly, other shrubs, cholla

Butcherknife

Landforms: Alluvial flats
Geomorphic positions, two-dimensional: Footslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium derived from tuff

Typical Profile

A—0 to 4 inches; moderately alkaline silty clay loam
Bw—4 to 22 inches; moderately alkaline clay
Bkyz—22 to 30 inches; moderately alkaline clay
BCkyz—30 to 41 inches; moderately alkaline clay loam
Cr—41 to 80 inches; tuff bedrock

Properties and Qualities

Slope: 0 to 3 percent
Depth to first restrictive layer: 40 to 60 inches to bedrock, paralithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 6.0 inches (moderate)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Clay Flat, Desert Grassland
Ecological site number: R042XC241TX
Typical vegetation: Tobosa, vine mesquite, blue grama, cane bluestem, sideoats grama, alkali sacaton, other forbs, other perennial grasses, ear muhly, other shrubs, cholla

MPB—Melado-Pantera complex, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 92 percent
Melado and similar soils: 54 percent
Pantera and similar soils: 38 percent
Minor components: 8 percent
Baviza soils have a sandy control section and occur on higher positions: 3 percent
Geefour soils are shallow to densic bedrock and occur on slightly higher positions: 3 percent
Riverwash occurs along the channel of drainages: 2 percent

Major Component Descriptions

Melado

Landforms: Alluvial flats (fig. 24)
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gypsiferous clayey lacustrine deposits

Typical Profile

An—0 to 4 inches; moderately alkaline silty clay
Bnyz—4 to 44 inches; moderately alkaline silty clay
BCnyz—44 to 61 inches; strongly alkaline clay loam
Cnyz—61 to 80 inches; strongly alkaline clay

Properties and Qualities

Slope: 1 to 5 percent
Depth to first restrictive layer: No restrictive layer
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 4.2 inches (low)

Figure 24.—Melado soils in an area of Melado-Pantera complex, 1 to 5 percent slopes. Melado soils occur on alluvial flats. This area also shows in the background, small flat-topped erosion remnants of the Geefour soils. Chinati Mountain is in the far background.

Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Salty Clay Fan, Hot Desert Shrub
Ecological site number: R042XG747TX
Typical vegetation: Creosotebush, western honey mesquite, tubercled saltbush, fourwing saltbush, alkali sacaton, tobosa, annual grasses, other annual forbs, other shrubs, other perennial forbs

Pantera

Landforms: Flood plains on alluvial flats
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gypsiferous sandy and gravelly alluvium and/or lacustrine deposits derived from igneous rock

Typical Profile

Ay—0 to 2 inches; strongly alkaline gravelly coarse sandy loam
By—2 to 9 inches; strongly alkaline silty clay

2By—9 to 80 inches; strongly alkaline extremely gravelly coarse sand, extremely gravelly coarse sandy loam, and very gravelly coarse sand

Properties and Qualities

Slope: 1 to 5 percent
Depth to first restrictive layer: No restrictive layer
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 2 inches (very low)
Natural drainage class: Somewhat excessively drained
Runoff: Medium
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 7w
Ecological site name: Arroyo, Hot Desert Shrub
Ecological site number: R042XG736TX
Typical vegetation: Western honey mesquite, other shrubs, creosotebush, other perennial grasses, desert willow, catclaw acacia, sideoats grama, tanglehead, cane bluestem, black grama, Chino grama, croton, other perennial forbs, sand dropseed, elbowbush, spiny hackberry, Warnock condalia, whiplash pappusgrass, leatherstem, Trans-Pecos poreleaf

MUB—Murray-Marfa-Boracho association, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 94 percent
Murray and similar soils: 58 percent
Marfa and similar soils: 21 percent
Boracho and similar soils: 15 percent
Minor components: 6 percent
Musquiz soils have a fine textured control section, an argillic horizon, and occur on slightly lower positions: 6 percent

Major Component Descriptions

Murray

Landforms: Fan piedmonts
Geomorphic positions, two-dimensional: Summit
Geomorphic positions, three-dimensional: Tread

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 9 inches; moderately alkaline fine sandy loam
Bk1—9 to 26 inches; moderately alkaline loam
Bk2—26 to 47 inches; moderately alkaline sandy clay loam
Bk3—47 to 80 inches; moderately alkaline sandy loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 7 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Loamy Slope, Mixed Prairie (fig. 25)
Ecological site number: R042XE694TX
Typical vegetation: Black grama, blue grama, sideoats grama, other perennial grasses, other shrubs, cane bluestem, bristlegrass, other forbs, sand muhly, sand dropseed, spiderling grass, Ephedra, woolly butterflybush, soaptree yucca

Marfa

Landforms: Drainageways on fan piedmonts
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 4 inches; slightly acid clay loam
Bt1—4 to 24 inches; neutral clay loam and clay
Bt2—24 to 41 inches; slightly alkaline clay
2Btk—41 to 69 inches; moderately alkaline loam and fine sandy loam
2Bk—69 to 80 inches; moderately alkaline loamy fine sand

Properties and Qualities

Slope: 1 to 2 percent
Percent of area covered by surface fragments: About 1 percent rounded gravel
Depth to first restrictive layer: No restrictive layer

Figure 25.—Sideoats grama, cane bluestem, blue grama, burrograss, and grubbed mesquite on Murray loam, in an area of Murray-Marfa-Boracho association, 1 to 5 percent slopes . Murray soils are in the Loamy Slope ecological site, Mixed Prairie vegetative zone.

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 9.0 inches (high)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2c
Ecological site name: Loamy Swale, Mixed Prairie
Ecological site number: R042XE279TX
Typical vegetation: Blue grama, sideoats grama, cane bluestem, vine mesquite, bristlegrass, tobosa, other forbs, Swallen's curly mesquite, buffalograss, sand muhly, other shrubs, bundleflower, woolly butterflybush, other perennial grasses

Boracho

Landforms: Fan piedmonts
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Crest, tread
Down-slope shape: Linear

Across-slope shape: Convex, linear
Parent material: Gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 5 inches; moderately alkaline very gravelly loam
Bk—5 to 10 inches; moderately alkaline extremely gravelly loam
Bkkm—10 to 25 inches; cemented material
BCk—25 to 80 inches; moderately alkaline extremely gravelly sandy clay loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 5 percent subrounded gravel
Depth to first restrictive layer: 7 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.8 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

MZA—Musquiz clay loam, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 80 percent
- Musquiz and similar soils: 80 percent

Minor components: 20 percent
- Berrend soils have a fine-loamy control section and occur on similar positions: 10 percent
- Boracho soils have a loamy-skeletal control section, are shallow to a petrocalcic horizon and occur on slightly higher positions: 5 percent

Murray soils have a fine-loamy control section, do not have an argillic horizon and occur on similar positions: 5 percent

Major Component Descriptions

Musquiz

Landforms: fan skirts on fan piedmonts (fig. 26)
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous rock

Typical Profile

A—0 to 7 inches; slightly alkaline clay loam
Bt—7 to 35 inches; neutral clay
Bk—35 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 0 to 3 percent
Percent of area covered by surface fragments: About 5 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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

Figure 26.—An area of Musquiz clay loam, 0 to 3 percent slopes. Musquiz soils are on fan skirts on fan piedmonts in Intermontane basins.

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

Interpretive Groups

Land capability nonirrigated: 3c
Ecological site name: Loamy Swale, Mixed Prairie
Ecological site number: R042XE279TX
Typical vegetation: Blue grama, sideoats grama, cane bluestem, vine mesquite, bristlegrass, tobosa, other forbs, Swallen's curly mesquite, buffalograss, sand muhly, other shrubs, bundleflower, woolly butterflybush, other perennial grasses

NLA—Nillo silty clay, 0 to 2 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 90 percent
Nillo and similar soils: 90 percent
Minor components: 10 percent
Gemelo soils have a coarse-loamy control section and occur on higher foot or toe slopes: 5 percent
Straddlebug soils have a fine-loamy control section and occur on higher foot or toe slopes: 5 percent

Major Component Descriptions

Nillo

Landforms: Flood plains
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from tuff

Typical Profile

A—0 to 3 inches; moderately alkaline silty clay
C—3 to 26 inches; moderately alkaline stratified loam
Ab—26 to 32 inches; moderately alkaline clay loam
Bwb—32 to 46 inches; moderately alkaline clay loam
Bkb—46 to 80 inches; strongly alkaline clay loam

Properties and Qualities

Slope: 0 to 2 percent
Depth to first restrictive layer: No restrictive layer
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 10.7 inches (high)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Draw, Desert Grassland
Ecological site number: R042XC242TX
Typical vegetation: Sideoats grama, cane bluestem, giant sacaton, vine mesquite, other perennial grasses, threeawn, blue grama, Arizona cottontop, green sprangletop, tobosa, plains bristlegrass, alkali sacaton, other perennial forbs, other shrubs

NPB—Nolam and Paisano soils, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
- Nolam and similar soils: 55 percent
- Paisano and similar soils: 25 percent

Minor components: 20 percent
- Bullis soils have a clayey-skeletal control section and occur on similar positions: 10 percent
- Altar soils do not have an argillic or petrocalcic horizon and occur on lower positions: 5 percent
- Kinco soils have a coarse-loamy control section, do not have an argillic or petrocalcic horizon, and occur on lower positions: 5 percent

This is an undifferentiated map unit. These components are not consistently associated geographically. At least one component is present in every delineation, but each delineation can have any combination of the components. The representative value percentages listed above are the result of map unit analysis of transect documentation for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Nolam

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or pedisediment derived from igneous and sedimentary rock

Typical Profile

A—0 to 2 inches; moderately alkaline gravelly sandy loam
Btk1—2 to 11 inches; moderately alkaline extremely gravelly sandy clay loam
Btk2—11 to 45 inches; moderately alkaline very gravelly sandy clay loam
Bk1—45 to 63 inches; strongly alkaline gravelly sandy loam
Bk2—63 to 80 inches; strongly alkaline very gravelly sandy loam

Properties and Qualities

Slope: 1 to 3 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 1 percent subrounded cobbles
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 4.6 inches (low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

Paisano

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or pedisediment derived from igneous and sedimentary rock

Typical Profile

A—0 to 4 inches; moderately alkaline extremely gravelly sandy loam
Bk—4 to 13 inches; moderately alkaline extremely gravelly sandy clay loam
Bkkm—13 to 27 inches; cemented material
BCk—27 to 80 inches; moderately alkaline extremely gravelly loamy sand

Properties and Qualities

Slope: 1 to 3 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel
Depth to first restrictive layer: 7 to 20 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately rapid)

Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.6 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

PAC—Paisano very gravelly fine sandy loam, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
Paisano and similar soils: 80 percent
Minor components: 20 percent
Terino soils have an argillic horizon and occur on similar or slightly higher positions: 10 percent
Cienega soils do not have a petrocalcic horizon and occur on similar positions: 5 percent
Crossen soils have less than 35 percent rock fragments in the control section and occur on similar or slightly higher positions: 5 percent

Major Component Descriptions

Paisano

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or pedisediment derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly fine sandy loam
Bk—3 to 8 inches; moderately alkaline very gravelly loam

Bkkm—8 to 14 inches; cemented material
BCk—14 to 80 inches; moderately alkaline very gravelly sandy loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel
Depth to first restrictive layer: 7 to 14 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.5 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

PAD—Paisano very gravelly fine sandy loam, 5 to 16 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
Paisano and similar soils: 80 percent
Minor components: 20 percent
Cienega soils do not have a petrocalcic horizon and occur on similar positions: 10 percent
Crossen soils have less than 35 percent rock fragments in the control section and occur on similar or slightly higher positions: 10 percent

Major Component Descriptions

Paisano

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Gravelly alluvium and/or pedisediment derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly fine sandy loam
Bk—3 to 8 inches; moderately alkaline very gravelly loam
Bkkm—8 to 14 inches; cemented material
BCk—14 to 80 inches; moderately alkaline very gravelly sandy loam

Properties and Qualities

Slope: 5 to 16 percent
Percent of area covered by surface fragments: About 3 percent subrounded cobbles, about 57 percent subrounded gravel
Depth to first restrictive layer: 7 to 14 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.5 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

PIB—Paisano-Musgrave association, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 90 percent
- Paisano and similar soils: 55 percent
- Musgrave and similar soils: 35 percent

Minor components: 10 percent
- Rockpens soils are very deep to bedrock, do not have a petrocalcic horizon, and occur on lower positions: 5 percent
- Straddlebug soils have a fine-loamy control section and occur on lower positions: 5 percent

Major Component Descriptions

Paisano

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or pedisediment derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly fine sandy loam
Bk—3 to 8 inches; moderately alkaline very gravelly loam
Bkkm—8 to 14 inches; cemented material
BCk—14 to 80 inches; moderately alkaline very gravelly sandy loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 3 percent subrounded cobbles, about 57 percent subrounded gravel
Depth to first restrictive layer: 7 to 14 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.5 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

Musgrave

Landforms: Pediments
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from tuff

Typical Profile

A—0 to 5 inches; moderately alkaline clay loam
Ck—5 to 18 inches; moderately alkaline clay loam

Cdk—18 to 80 inches; moderately alkaline noncemented tuff densic material that has a texture of clay loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 1 percent subrounded boulders, about 5 percent subrounded stones, about 10 percent subrounded cobbles, about 45 percent subrounded gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, densic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 4.0 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Clay Hill, Hot Desert Shrub
Ecological site number: R042XG739TX
Typical vegetation: Tobosa, false grama, western honey mesquite, other forbs, other shrubs, sideoats grama, Arizona cottontop, Chino grama, creosotebush, leatherstem, other perennial grasses, Hall's panicum

PKD—Pantak and Lingua soils, 1 to 16 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Hills, mountains
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 81 percent
Pantak and similar soils: 46 percent
Lingua and similar soils: 35 percent
Minor components: 19 percent
Unnamed soils occur throughout the unit: 13 percent
Rock outcrop: 6 percent

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Major Component Descriptions

Pantak

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from igneous rock

Typical Profile

A—0 to 3 inches; neutral very gravelly sandy clay loam
Bt—3 to 8 inches; neutral extremely gravelly sandy clay loam
R—8 to 22 inches; trachyte bedrock

Properties and Qualities

Slope: 1 to 16 percent
Percent of area covered by surface fragments: 50 percent nonflat 2- to 75-millimeter trachyte fragments and 30 percent nonflat 75- to 250-millimeter trachyte fragments and 2 percent nonflat 250- to 600-millimeter trachyte fragments
Depth to first restrictive layer: 7 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.5 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Sideoats grama, tanglehead, black grama, Arizona cottontop, other perennial grasses, other perennial forbs, cane bluestem, bush muhly, other shrubs, skeletonleaf goldeneye, range ratany, catclaw acacia, mariola

Lingua

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from igneous rock

Typical Profile

A—0 to 4 inches; slightly alkaline extremely gravelly sandy clay loam
R—4 to 14 inches; igneous bedrock

Properties and Qualities

Slope: 1 to 16 percent
Percent of area covered by surface fragments: About 75 percent subangular gravel, about 5 percent subangular cobbles
Depth to first restrictive layer: 3 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.2 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

PKE—Pantak and Lingua soils, and Rock outcrop, 10 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 79 percent
- Pantak and similar soils: 36 percent
- Lingua and similar soils: 24 percent
- Rock outcrop and similar soils: 19 percent

Minor components: 21 percent
- Ohtwo soils are deep to bedrock and occur on lower colluvial side or footslopes: 12 percent
- Unnamed soils occur throughout the unit: 9 percent

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Major Component Descriptions

Pantak

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from igneous rock

Typical Profile

A—0 to 3 inches; neutral very gravelly sandy clay loam
Bt—3 to 8 inches; neutral extremely gravelly sandy clay loam
R—8 to 18 inches; trachyte bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 50 percent angular gravel, about 30 percent angular cobbles, about 2 percent angular stones
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.5 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Sideoats grama, tanglehead, black grama, Arizona cottontop, other perennial grasses, other perennial forbs, cane bluestem, bush muhly, other shrubs, skeletonleaf goldeneye, range ratany, catclaw acacia, mariola

Lingua

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from igneous rock

Typical Profile

A—0 to 8 inches; slightly alkaline extremely cobbly loam
R—8 to 18 inches; igneous bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 75 percent subangular gravel, about 5 percent subangular cobbles
Depth to first restrictive layer: 4 to 10 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Rock outcrop

Landforms: Hills
Geomorphic positions, three-dimensional: Nose slope
Parent material: Igneous rock

Typical Profile

R—0 to 10 inches; igneous bedrock

Properties and Qualities

Slope: 10 to 30 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 8s
Ecological site name: Not assigned
Ecological site number: Not assigned
Typical vegetation: Unspecified

PTA—Phantom clay loam, 0 to 2 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 86 percent
Phantom and similar soils: 86 percent
Minor components: 14 percent
Marfa soils do not have vertic properties and occur on slightly higher positions: 11 percent
Musquiz soils have an argillic and a calcic horizon and occur on slightly higher foot or toe slopes: 3 percent

Major Component Descriptions

Phantom

Landforms: Alluvial flats
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Clayey alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline clay loam
Bw—3 to 27 inches; moderately alkaline clay
Bk—27 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 0 to 2 percent
Depth to first restrictive layer: No restrictive layer
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 9.5 inches (high)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 3w
Ecological site name: Clay Flat, Mixed Prairie
Ecological site number: R042XE272TX
Typical vegetation: Tobosa, vine mesquite, blue grama, cane bluestem, sideoats grama, alkali sacaton, other forbs, other perennial grasses, ear muhly, other shrubs, cholla

PZB—Phantom-Musquiz complex, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 84 percent
Phantom and similar soils: 45 percent
Musquiz and similar soils: 39 percent
Minor components: 16 percent
Berrend soils have a fine-loamy control section and occur on slightly higher positions: 12 percent
Unnamed soils occur throughout the unit: 4 percent

Major Component Descriptions

Phantom

Landforms: Alluvial flats
Geomorphic positions, two-dimensional: Footslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium derived from igneous rock

Typical Profile

A—0 to 3 inches; moderately alkaline clay
Bw—3 to 30 inches; moderately alkaline clay
Bk—30 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: No restrictive layer
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 10.2 inches (high)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3s
Ecological site name: Clay Flat, Mixed Prairie
Ecological site number: R042XE272TX
Typical vegetation: Tobosa, vine mesquite, blue grama, cane bluestem, sideoats grama, alkali sacaton, other forbs, other perennial grasses, ear muhly, other shrubs, cholla

Musquiz

Landforms: Fan piedmonts
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous rock

Typical Profile

A—0 to 8 inches; neutral clay loam
Bt—8 to 23 inches; neutral clay loam
Bk—23 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 5 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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 8.9 inches (moderate)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Loamy Swale, Mixed Prairie
Ecological site number: R042XE279TX
Typical vegetation: Blue grama, sideoats grama, cane bluestem, vine mesquite, bristlegrass, tobosa, other forbs, Swallen's curly mesquite, buffalograss, sand muhly, other shrubs, bundleflower, woolly butterflybush, other perennial grasses

QBE—Quadria, Nolam, and Musgrave soils, 0 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 95 percent
Quadria and similar soils: 40 percent
Nolam and similar soils: 30 percent
Musgrave and similar soils: 25 percent

Minor components: 5 percent
Borunda soils are moderately deep to bedrock, do not have an argillic horizon, and occur on lower foot or toe slopes: 5 percent

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Major Component Descriptions

Quadria

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: clayey alluvium and/or pedisediment derived from tuff

Typical Profile

A—0 to 5 inches; slightly alkaline loam
Btn—5 to 17 inches; moderately alkaline clay
Btkn—17 to 46 inches; moderately alkaline gravelly clay, very gravelly clay loam, and very gravelly sandy clay loam
Bkn—46 to 57 inches; strongly alkaline fine sandy loam
BCk—57 to 80 inches; strongly alkaline gravelly coarse sandy loam

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 30 percent subrounded gravel
Depth to first restrictive layer: 5 inches to bedrock, natric
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (slow)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
Salinity, representative within 40 inches: Not 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 6.8 inches (moderate)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC250TX
Typical vegetation: Blue grama, black grama, burrograss, other perennial grasses, tobosa, sideoats grama, other forbs, Arizona cottontop, plains bristlegrass, bush muhly, cane bluestem, other shrubs, tarbush

Nolam

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or pedisediment derived from tuff

Typical Profile

A—0 to 5 inches; slightly alkaline gravelly loam
Bt—5 to 12 inches; slightly alkaline extremely gravelly clay loam
Btk—12 to 18 inches; moderately alkaline very gravelly clay
Bk—18 to 48 inches; moderately alkaline extremely cobbly silt loam
2Bk—48 to 80 inches; moderately alkaline extremely gravelly loam

Properties and Qualities

Slope: 1 to 3 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 1 percent subrounded cobbles
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 3.9 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

Musgrave

Landforms: Dissected pediments
Geomorphic positions, two-dimensional: Shoulder, backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from tuff

Typical Profile

A—0 to 5 inches; moderately alkaline clay loam
Ck—5 to 18 inches; moderately alkaline clay loam
Cdk—18 to 80 inches; moderately alkaline noncemented tuff densic material that has a texture of clay loam

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 45 percent subrounded gravel, about 1 percent subrounded boulders, about 10 percent subrounded cobbles, about 5 percent subrounded stones
Depth to first restrictive layer: 4 to 20 inches to bedrock, densic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 4.0 inches (low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Clay Hill, Hot Desert Shrub
Ecological site number: R042XG739TX
Typical vegetation: Tobosa, false grama, western honey mesquite, other forbs, other shrubs, sideoats grama, Arizona cottontop, Chino grama, creosotebush, leatherstem, other perennial grasses, Hall's panicum

RCE—Redford and Corazones soils, 10 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 84 percent
Redford and similar soils: 52 percent
Corazones and similar soils: 32 percent
Minor components: 16 percent
Unnamed soils occur throughout the unit: 13 percent
Ojinaga soils have a petrocalcic horizon and occur on higher summits and ridge tops: 3 percent

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Major Component Descriptions

Redford

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or residuum weathered from fanglomerate

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly sandy loam
Bk—3 to 14 inches; moderately alkaline gravelly sandy loam
R—14 to 24 inches; fanglomerate bedrock

Properties and Qualities

Slope: 10 to 20 percent
Percent of area covered by surface fragments: About 50 percent subrounded gravel, about 35 percent subrounded cobbles
Depth to first restrictive layer: 7 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, creosotebush, other forbs, feather pappusgrass, triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg's coldenia

Corazones

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Backslope, footslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly fine sandy loam
Bk1—3 to 48 inches; moderately alkaline very gravelly fine sandy loam
Bk2—48 to 80 inches; moderately alkaline extremely gravelly loamy coarse sand

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 3 percent subrounded cobbles, about 70 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 4.1 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7e
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, creosotebush, other forbs, feather pappusgrass, triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg's coldenia

RCG—Redford and Corazones soils, 30 to 70 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 90 percent
Redford and similar soils: 54 percent
Corazones and similar soils: 36 percent
Minor components: 10 percent
Rock outcrop: 10 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Redford

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or residuum weathered from fanglomerate

Typical Profile

A—0 to 2 inches; moderately alkaline very gravelly sandy loam
Bk—2 to 16 inches; moderately alkaline very gravelly sandy loam
R—16 to 26 inches; fanglomerate bedrock

Properties and Qualities

Slope: 30 to 70 percent
Percent of area covered by surface fragments: About 50 percent subrounded gravel, about 35 percent subrounded cobbles
Depth to first restrictive layer: 7 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7e
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, creosotebush, other forbs, feather pappusgrass, triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg's coldenia

Corazones

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Backslope, footslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 6 inches; moderately alkaline very gravelly fine sandy loam
Bk1—6 to 48 inches; moderately alkaline very gravelly fine sandy loam
Bk2—48 to 80 inches; moderately alkaline extremely gravelly loamy coarse sand

Properties and Qualities

Slope: 30 to 50 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 5 percent subrounded cobbles, about 45 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 4.1 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7e
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, creosotebush, other forbs, feather pappusgrass, triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg's coldenia

RED—Redlight and Terlingua soils and Rock outcrop, 5 to 35 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Hills, mountains
Elevation: 2,995 to 3,995 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition Estimates

Major components: 84 percent
Redlight and similar soils: 45 percent
Rock outcrop and similar soils: 24 percent
Terlingua and similar soils: 15 percent
Minor components: 16 percent
Unnamed soils occur throughout the unit: 16 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Redlight

Landforms: Hills, mountains
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly colluvium derived from limestone over gravelly residuum weathered from limestone

Typical Profile

A—0 to 7 inches; moderately alkaline very gravelly coarse sandy loam
Bk—7 to 15 inches; moderately alkaline very gravelly coarse sandy loam
R—15 to 25 inches; limestone bedrock

Properties and Qualities

Slope: 15 to 35 percent
Percent of area covered by surface fragments: About 2 percent subangular boulders, about 10 percent subangular cobbles, about 35 percent subangular gravel, about 3 percent subangular stones
Depth to first restrictive layer: 7 to 20 inches to bedrock, lithic
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 0.8 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill and Mountain, Hot Desert Shrub
Ecological site number: R042XG737TX
Typical vegetation: Chino grama, other forbs, black grama, sideoats grama, other perennial grasses, creosotebush, guayacan, candelilla, other shrubs, triden, lechuguilla, Big Bend cenizo

Terlingua

Landforms: Hills
Geomorphic positions, three-dimensional: Head slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from trachyte

Typical Profile

A—0 to 9 inches; slightly alkaline very gravelly coarse sandy loam
R—9 to 19 inches; trachyte bedrock

Properties and Qualities

Slope: 5 to 35 percent
Percent of area covered by surface fragments: About 12 percent subrounded cobbles, about 64 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
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 0.5 inch (very low)
Natural drainage class: Well drained

Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Hot Desert Shrub
Ecological site number: R042XG264TX
Typical vegetation: Chino grama, black grama, other perennial forbs, sideoats grama, triden, feathery dalea, Arizona cottontop, tanglehead, range ratany, cenizo, leatherstem, skeletonleaf goldeneye, other shrubs, other annual forbs.

Rock outcrop

Landforms: Ledges on hills, ledges on mountains
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Mountainflank
Parent material: Trachyte

Typical Profile

R—0 to 10 inches; trachyte bedrock

Properties and Qualities

Slope: 20 to 70 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
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
Flooding frequency: Not flooded

Interpretive Groups

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

REE—Reduff, Scotal, and Holguin soils, 1 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
- Scotal and similar soils: 30 percent
- Reduff and similar soils: 30 percent
- Holguin and similar soils: 25 percent

Minor components: 15 percent
- Chilicotal soils are very deep to bedrock and occur on higher summits or ridges: 5 percent

Gemelo soils are very deep to bedrock, have a coarse-loamy control section, and occur on lower footslopes: 5 percent
Rock outcrop: 5 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Reduff

Landforms: Hills
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from tuff

Typical Profile

A—0 to 4 inches; moderately alkaline very gravelly loam
C—4 to 15 inches; slightly alkaline extremely gravelly loam
R—15 to 25 inches; tuff bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 2 percent subangular boulders, about 5 percent subangular stones, about 10 percent subangular cobbles, about 50 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.9 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Scotal

Landforms: Hills
Geomorphic positions, two-dimensional: Summit, backslope

Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from tuff

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly sandy clay loam
Bk—3 to 8 inches; moderately alkaline very gravelly clay loam
R—8 to 18 inches; unweathered tuff bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 2 percent subangular boulders, about 5 percent subangular stones, about 10 percent subangular cobbles, about 40 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Holguin

Landforms: Hills
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from tuff and/or conglomerate

Typical Profile

A—0 to 9 inches; moderately alkaline very gravelly sandy loam
BCk—9 to 19 inches; moderately alkaline extremely channery sandy loam
R—19 to 29 inches; tuff bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 1 percent rounded stones, about 5 percent rounded cobbles, about 60 percent rounded gravel

Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.0 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

RIA—Riverwash and Pantera soils, 0 to 2 percent slopes, frequently flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 86 percent
- Riverwash and similar soils: 50 percent
- Pantera and similar soils: 36 percent

Minor components: 14 percent
- Corazones soils have a loamy-skeletal control section and occur on higher side slopes: 5 percent
- Lomapelona soils have a coarse-loamy control section and occur on similar positions: 5 percent
- Tornillo soils have a fine-loamy control section and occur on slightly higher footslopes: 3 percent
- Unnamed hydric soils occur on slightly lower positions: 1 percent

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Major Component Descriptions

Riverwash

Landforms: Flood plains (fig. 27)
Parent material: Sandy and gravelly alluvium derived from igneous and sedimentary rock

Properties and Qualities

Slope: 0 to 2 percent
Depth to first restrictive layer: No restrictive layer
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
Runoff: Very low
Flooding frequency: Frequent

Interpretive Groups

Land capability nonirrigated: Not assigned
Ecological site name: Not assigned
Ecological site number: Not assigned

Figure 27.—Riverwash in the foreground, is devoid of permanent vegetation because of frequent scour by floodwaters. In the background, saltcedar has established on an area of Pantera soil. Pantera soils are in the Draw ecological site, Hot Desert Shrub vegetative zone of MLRA 42—Southern Desertic Basins, Plains, and Mountains. Saltcedar leaves turn a brilliant yellow color after the first fall freeze, and is quite visible on aerial photography flown at that time.

Pantera

Landforms: Flood plains on arroyos
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Holocene age sandy and gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; strongly alkaline gravelly sandy loam
Ck—3 to 18 inches; strongly alkaline gravelly coarse sandy loam and very gravelly loamy coarse sand
C—18 to 80 inches; strongly alkaline very gravelly coarse sand

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 5 percent subrounded cobbles, about 60 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 1.4 inches (very low)
Natural drainage class: Excessively drained
Runoff: Very low
Flooding frequency: Frequent

Interpretive Groups

Land capability nonirrigated: 7w
Ecological site name: Arroyo, Hot Desert Shrub (fig. 28)
Ecological site number: R042XG736TX
Typical vegetation: Western honey mesquite, other shrubs, creosotebush, other perennial grasses, desert willow, catclaw acacia, sideoats grama, tanglehead, cane bluestem, black grama, Chino grama, croton, other perennial forbs, sand dropseed, elbowbush, spiny hackberry, Warnock condalia, whiplash pappusgrass, leatherstem, Trans-Pecos poreleaf

RMB—Rockhouse, flooded-Medley complex, 0 to 5 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Figure 28.—Desert willow in an area of Riverwash and Pantera soils, 0 to 2 percent slopes, frequently flooded. The dark colored mineral on the arroyo channel is magnetite, derived from igneous rocks and transported by flowing water. Because magnetite has a particle density greater than 5.0 g/cm^3, it quickly falls from suspension as flow velocity decreases.

Composition

Major components: 87 percent
Rockhouse and similar soils: 60 percent
Medley and similar soils: 27 percent
Minor components: 13 percent
Marfa soils have a fine textured control section and occur on similar positions: 10 percent
Rock outcrop: 3 percent

Major Component Descriptions

Rockhouse

Landforms: Flood plains (fig. 29)
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Gravelly alluvium derived from igneous rock

Typical Profile

A—0 to 13 inches; slightly alkaline loam
Bk—13 to 80 inches; moderately alkaline very gravelly sandy loam

Figure 29.—An area of Rockhouse, flooded-Medley complex, 0 to 5 percent slopes. This map unit is on flood plains.

Properties and Qualities

Slope: 0 to 1 percent
Percent of area covered by surface fragments: About 1 percent subrounded cobbles, about 10 percent subrounded gravel, about 1 percent subrounded stones
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 5.7 inches (low)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Draw, Mixed Prairie
Ecological site number: R042XE273TX
Typical vegetation: Sideoats grama, cane bluestem, other perennial grasses, blue grama, green sprangletop, bulb panicgrass, vine mesquite, plains bristlegrass, giant sacaton, other forbs, other trees, other shrubs, Apache plume, walnut, gray oak

Medley

Landforms: Drainageways
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loamy alluvium derived from igneous rock

Typical Profile

A1—0 to 6 inches; slightly alkaline gravelly sandy clay loam
A2—6 to 22 inches; moderately alkaline sandy clay loam
Bk1—22 to 58 inches; moderately alkaline loam
Bk2—58 to 80 inches; moderately alkaline gravelly loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 1 percent subrounded cobbles, about 38 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Gravelly, Mixed Prairie
Ecological site number: R042XE275TX
Typical vegetation: Other perennial grasses, sideoats grama, black grama, blue grama, cane bluestem, plains bristlegrass, green sprangletop, plains lovegrass, other perennial forbs, other shrubs, javelinabush

SCB—Sanmoss-Medley complex, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Piedmont slopes
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 90 percent
Sanmoss and similar soils: 65 percent

Medley and similar soils: 25 percent
Minor components: 10 percent
Musquiz soils have a fine textured control section and occur on slightly higher positions: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Major Component Descriptions

Sanmoss

Landforms: Proximal fan piedmonts
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly fan alluvium derived from igneous rock

Typical Profile

A—0 to 3 inches; slightly alkaline very gravelly loam
Bw—3 to 12 inches; slightly alkaline very gravelly loam
Bk—12 to 55 inches; moderately alkaline very gravelly loam
C—55 to 80 inches; moderately alkaline very gravelly sandy loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 2 percent subrounded cobbles, about 35 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 6.4 inches (moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Gravelly, Mixed Prairie
Ecological site number: R042XE275TX
Typical vegetation: Other perennial grasses, sideoats grama, black grama, blue grama, cane bluestem, plains bristlegrass, green sprangletop, plains lovegrass, other perennial forbs, other shrubs, javelinabush

Medley

Landforms: Alluvial fans, drainageways
Geomorphic positions, two-dimensional: Footslope, toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Loamy fan alluvium derived from igneous rock

Typical Profile

A1—0 to 11 inches; neutral gravelly loam
A2—11 to 25 inches; neutral gravelly sandy loam
Bk—25 to 80 inches; moderately alkaline gravelly clay loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 1 percent subrounded stones, about 1 percent subrounded cobbles, about 38 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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 7.8 inches (moderate)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Gravelly, Mixed Prairie (fig. 30)
Ecological site number: R042XE275TX
Typical vegetation: Other perennial grasses, sideoats grama, black grama, blue grama, cane bluestem, plains bristlegrass, green sprangletop, plains lovegrass, other perennial forbs, other shrubs, javelinabush

Figure 30.—Black grama, sideoats grama, pricklypear, ephedra, and western honey mesquite, on an area of Sanmoss-Medley complex, 1 to 5 percent slopes. This map unit is in the Gravelly ecological site, Mixed Prairie vegetative zone.

SDC—Sauceda and Boludo soils, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins (fig. 31)
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
- Sauceda and similar soils: 60 percent
- Boludo and similar soils: 20 percent

Minor components: 20 percent
- Decoty soils contain less than 18 percent clay in the control section, have a calcic horizon, and occur on similar positions: 5 percent
- Holguin soils contain less than 18 percent clay in the control section, do not have a calcic horizon, and occur on similar positions: 5 percent
- Rock outcrop: 5 percent
- Unnamed soils occur throughout the unit: 5 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Figure 31.—Aoudad sheep on an area of Sauceda and Boludo soils, 1 to 8 percent slopes. The Sauceda and Boludo soils are on dissected dip slopes on cuestas. Rock outcrop is a minor component of this map unit. These animals prefer rough rocky terrain mainly to elude their predators.

Major Component Descriptions

Sauceda

Landforms: Dissected dip slopes on cuestas
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from ignimbrite

Typical Profile

A1—0 to 2 inches; moderately alkaline very gravelly loam
A2—2 to 8 inches; moderately alkaline very cobbly loam
Rk and R—8 to 22 inches; ignimbrite bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 55 percent subrounded gravel, about 9 percent subrounded cobbles, about 1 percent subrounded stones, about 1 percent subrounded boulders
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Boludo

Landforms: Dissected dip slopes on cuestas
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from ignimbrite

Typical Profile

A—0 to 4 inches; moderately alkaline very gravelly clay loam
Bk—4 to 11 inches; moderately alkaline very gravelly clay loam

Bkkm—11 to 17 inches; cemented material
R—17 to 27 inches; ignimbrite bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 1 percent subangular stones, about 10 percent subangular cobbles, about 45 percent subangular gravel
Depth to first restrictive layer: 7 to 18 inches to bedrock, petrocalcic; 10 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Desert Grassland
Ecological site number: R042XC244TX
Typical vegetation: Sideoats grama, black grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

SEE—Sauceda-Decoty complex, 1 to 20 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 95 percent
Sauceda and similar soils: 55 percent
Decoty and similar soils: 40 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Major Component Descriptions

Sauceda

Landforms: Dissected dip slopes on cuestas
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Residuum weathered from ignimbrite

Typical Profile

A1—0 to 2 inches; slightly alkaline very gravelly loam
A2—2 to 8 inches; moderately alkaline very cobbly loam
Rk and R—8 to 22 inches; ignimbrite bedrock

Properties and Qualities

Slope: 1 to 20 percent
Percent of area covered by surface fragments: About 55 percent subrounded gravel, about 9 percent subrounded cobbles, about 1 percent subrounded stones, about 1 percent subrounded boulders
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Decoty

Landforms: Dissected dip slopes on cuestas
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve, side slope
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Gravelly residuum weathered from rhyolite and/or ignimbrite

Typical Profile

A—0 to 5 inches; moderately alkaline very gravelly fine sandy loam
Bk—5 to 14 inches; moderately alkaline extremely cobbly fine sandy loam
R—14 to 24 inches; ignimbrite bedrock

Properties and Qualities

Slope: 1 to 20 percent
Percent of area covered by surface fragments: About 80 percent subangular gravel, about 10 percent subangular cobbles
Depth to first restrictive layer: 7 to 20 inches to bedrock, lithic

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.5 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

SHC—Scotal and Holguin soils, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
- Scotal and similar soils: 50 percent
- Holguin and similar soils: 35 percent

Minor components: 15 percent
- Borunda soils have a fine textured control section and occur on lower positions: 5 percent
- Gemelo soils are very deep to bedrock, have a coarse-loamy control section, and occur on lower positions: 5 percent
- Rock outcrop: 5 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Scotal

Landforms: Hills
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from tuff

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly sandy clay loam
Bk—3 to 8 inches; moderately alkaline very gravelly clay loam
R—8 to 24 inches; tuff bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 2 percent subangular boulders, about 5 percent subangular stones, about 10 percent subangular cobbles, about 40 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Holguin

Landforms: Hills
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from tuff and/or conglomerate

Typical Profile

A—0 to 9 inches; moderately alkaline very gravelly sandy loam
BCk—9 to 19 inches; moderately alkaline extremely channery sandy loam
R—19 to 23 inches; tuff bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 1 percent rounded stones, about 5 percent rounded cobbles, about 60 percent rounded gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.0 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

SHE—Scotal-Rock outcrop complex, 5 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Hills
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
Scotal and similar soils: 65 percent
Rock outcrop and similar soils: 15 percent
Minor components: 20 percent
Boludo soils have calcic and petrocalcic horizons and occur on higher summit or shoulder slopes: 10 percent
Ohtwo soils are deep to bedrock and occur on lower colluvial side or footslopes: 10 percent

Major Component Descriptions

Scotal

Landforms: Hills
Geomorphic positions, two-dimensional: Summit, shoulder, backslope, footslope, toeslope
Geomorphic positions, three-dimensional: Head slope, interfluve, side slope, nose slope, free face, crest, base slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from tuff

Typical Profile

A—0 to 2 inches; moderately alkaline very gravelly loam
Bk—2 to 7 inches; moderately alkaline extremely gravelly loam
R—7 to 17 inches; tuff bedrock

Properties and Qualities

Slope: 5 to 30 percent
Percent of area covered by surface fragments: About 60 percent subrounded medium and coarse gravel, about 5 percent subrounded cobbles, about 15 percent fine subrounded gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.5 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Rock outcrop

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Igneous rock

Typical Profile

R—0 to 10 inches; igneous bedrock

Properties and Qualities

Slope: 5 to 30 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

SIG—Scotal-Ohtwo-Rock outcrop complex, 20 to 70 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 90 percent
Scotal and similar soils: 40 percent
Ohtwo and similar soils: 30 percent
Rock outcrop and similar soils: 20 percent
Minor components: 10 percent
Borunda soils have a fine textured control section, are moderately deep to bedrock, and occur on lower foot or toe slopes: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Major Component Descriptions

Scotal

Landforms: Escarpments
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from tuff

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly sandy clay loam
Bk—3 to 8 inches; moderately alkaline very gravelly clay loam
R—8 to 18 inches; unweathered tuff bedrock

Properties and Qualities

Slope: 20 to 60 percent
Percent of area covered by surface fragments: About 2 percent subangular boulders, about 5 percent subangular stones, about 10 percent subangular cobbles, about 50 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Ohtwo

Landforms: Talus slopes on escarpments
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly colluvium derived from tuff and/or basalt

Typical Profile

A—0 to 8 inches; moderately alkaline very gravelly clay loam
Bk1—8 to 35 inches; moderately alkaline very gravelly clay loam
Bk2—35 to 42 inches; moderately alkaline very cobbly loam
Bk3—42 to 65 inches; moderately alkaline very gravelly loam
2R—65 to 80 inches; basalt bedrock

Properties and Qualities

Slope: 20 to 45 percent
Percent of area covered by surface fragments: About 65 percent subangular gravel, about 5 percent subangular cobbles
Depth to first restrictive layer: 60 to 80 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 6.5 inches (moderate)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7e
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Rock outcrop

Landforms: Ledges on escarpments, free faces on escarpments
Geomorphic positions, two-dimensional: Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Tuff

Typical Profile

R—0 to 10 inches; tuffaceous bedrock

Properties and Qualities

Slope: 45 to 70 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

SRA—Straddlebug silty clay loam, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
Straddlebug and similar soils: 80 percent
Minor components: 20 percent
Borunda soils have a fine textured control section, are moderately deep to bedrock, and occur on similar positions: 9 percent
Butcherknife soils have a fine textured control section and occur on lower positions: 9 percent
Unnamed soils occur throughout the unit: 2 percent

Major Component Descriptions

Straddlebug

Landforms: Alluvial flats
Geomorphic positions, two-dimensional: Footslope, toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Loamy alluvium derived from tuff

Typical Profile

A1—0 to 4 inches; moderately alkaline silty clay loam
A2—4 to 11 inches; moderately alkaline clay
Bnb—11 to 18 inches; moderately alkaline clay
Bknb1—18 to 26 inches; moderately alkaline clay loam
Bknb2—26 to 33 inches; moderately alkaline sandy clay loam
Bknb3—33 to 58 inches; moderately alkaline fine sandy loam
Bknb4—58 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 0 to 3 percent
Percent of area covered by surface fragments: About 2 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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: Sodic
Representative total available water capacity to 60 inches: About 8.9 inches (moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Rare

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC250TX
Typical vegetation: Blue grama, black grama, burrograss, other perennial grasses, tobosa, sideoats grama, other forbs, Arizona cottontop, plains bristlegrass, bush muhly, cane bluestem, other shrubs, tarbush

STE—Strawhouse-Stillwell complex, 1 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains (fig. 32)
Landscape: Intermontane basins
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 85 percent
Strawhouse and similar soils: 50 percent
Stillwell and similar soils: 35 percent
Minor components: 15 percent
Unnamed soils occur throughout the unit: 10 percent
Geefour soils have a clayey control section, shallow to bedrock, and occur on lower side slopes: 5 percent

Figure 32.—An area of Strawhouse-Stillwell complex, 1 to 30 percent slopes. Vegetation consists of creosotebush, Gregg's coldenia, range ratany, ocotillo, and fluffgrass. This map unit is in the Gravelly, Hot Desert Shrub, MLRA 42, Southern Desertic Basins, Plains, and Mountains.

Major Component Descriptions

Strawhouse

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or pedisediment derived from limestone

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly sandy loam
Bk—3 to 7 inches; moderately alkaline very gravelly loam
Bkkm—7 to 28 inches; cemented material
BCk—28 to 80 inches; moderately alkaline very gravelly sandy clay loam

Properties and Qualities

Slope: 1 to 16 percent
Percent of area covered by surface fragments: About 10 percent subangular cobbles, about 60 percent subangular gravel
Depth to first restrictive layer: 4 to 28 inches to bedrock, petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)

Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Hot Desert Shrub
Ecological site number: R042XG735TX
Typical vegetation: Chino grama, black grama, creosotebush, bush muhly, feather pappusgrass, triden, threeawn, fall witchgrass, perennial forbs, other perennial grasses, mariola, cenizo, skeletonleaf goldeneye, candelilla, ocotillo, leatherstem, other shrubs, fluffgrass, Gregg's coldenia, range ratany

Stillwell

Landforms: Fan remnants
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from limestone

Typical Profile

A—0 to 7 inches; moderately alkaline very gravelly coarse sandy loam and very gravelly fine sandy loam
Bk—7 to 25 inches; moderately alkaline very gravelly fine sandy loam
BCk—25 to 80 inches; moderately alkaline extremely gravelly coarse sandy loam

Properties and Qualities

Slope: 1 to 30 percent
Percent of area covered by surface fragments: About 2 percent subrounded cobbles, about 83 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: No restrictive layer
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 2.8 inches (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6e
Ecological site name: Gravelly, Hot Desert Shrub

Ecological site number: R042XG735TX
Typical vegetation: Chino grama, black grama, creosotebush, bush muhly, feather pappusgrass, triden, threeawn, fall witchgrass, perennial forbs, other perennial grasses, mariola, cenizo, skeletonleaf goldeneye, candelilla, ocotillo, leatherstem, other shrubs, fluffgrass, Gregg's coldenia, range ratany

SUD—Studybutte very gravelly sandy clay loam, 5 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Foothills, hills
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 85 percent
Studybutte and similar soils: 85 percent
Minor components: 15 percent
Rock outcrop: 8 percent
Corazones soils formed in deep, gravelly alluvial fan sediments and occur on higher summit or side slopes: 5 percent
Ojinaga soils formed in deep, gravelly alluvial fan sediments, have a petrocalcic horizon, and occur on higher summits or ridge tops: 2 percent

Major Component Descriptions

Studybutte

Landforms: Hills, high hills
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from trachyte and/or rhyolite

Typical Profile

A1—0 to 5 inches; slightly alkaline very gravelly sandy clay loam
A2—5 to 10 inches; slightly alkaline extremely gravelly sandy clay loam
R—10 to 20 inches; indurated tuff bedrock

Properties and Qualities

Slope: 5 to 30 percent
Percent of area covered by surface fragments: About 11 percent angular stones, about 25 percent angular cobbles, about 47 percent angular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Hot Desert Shrub
Ecological site number: R042XG264TX
Typical vegetation: Chino grama, black grama, perennial forbs, sideoats grama, triden, feathery dalea, Arizona cottontop, tanglehead, range ratany, cenizo, leatherstem, skeletonleaf goldeneye, other shrubs, other annual forbs.

SUE—Studybutte-Rock outcrop complex, 10 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 85 percent
Studybutte and similar soils: 60 percent
Rock outcrop and similar soils: 25 percent
Minor components: 15 percent
Unnamed soils occur throughout the unit: 13 percent
Geefour have a fine textured control section and occur on lower footslopes: 2 percent

Major Component Descriptions

Studybutte

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Summit, backslope
Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Gravelly residuum weathered from trachyte and/or rhyolite

Typical Profile

A—0 to 6 inches; slightly alkaline very gravelly loam and extremely gravelly loam
R—6 to 16 inches; trachyte bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 11 percent angular stones, about 25 percent angular cobbles, about 47 percent angular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Hot Desert Shrub (fig. 33)
Ecological site number: R042XG264TX
Typical vegetation: Chino grama, black grama, perennial forbs, sideoats grama, triden, feathery dalea, Arizona cottontop, tanglehead, range ratany, cenizo, leatherstem, skeletonleaf goldeneye, other shrubs, other annual forbs.

Rock outcrop

Landforms: Hills, mountains
Parent material: Trachyte and/or rhyolite

Typical Profile

R—0 to 10 inches; trachyte bedrock

Figure 33.—Chino grama, with lesser amounts of creosotebush and lechuguilla, forms a good vegetative cover on this area of Studybutte-Rock outcrop complex, 10 to 30 percent slopes. Plant cover and rock fragments protect the soil from raindrop impact, which can initiate the process of soil erosion. The Studybutte soils are in the Igneous Hill and Mountain ecological site, Hot Desert Shrub vegetative zone of MLRA 42—Southern Desertic Basins, Plains, and Mountains.

Properties and Qualities

Slope: 10 to 30 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

SUG—Studybutte-Rock outcrop complex, 20 to 60 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 90 percent
Studybutte and similar soils: 60 percent
Rock outcrop and similar soils: 30 percent
Minor components: 10 percent
Unnamed soils occur throughout the unit: 8 percent
Geefour soils have a clayey control section and occur on lower side and footslopes: 2 percent

Major Component Descriptions

Studybutte

Landforms: Mountains, hills
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Mountainflank, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from trachyte and/or rhyolite

Typical Profile

A—0 to 6 inches; slightly alkaline very gravelly loam and extremely gravelly loam
R—6 to 16 inches; trachyte bedrock

Properties and Qualities

Slope: 20 to 45 percent
Percent of area covered by surface fragments: About 19 percent angular stones, about 10 percent angular cobbles, about 26 percent angular gravel
Depth to first restrictive layer: 4 to 20 inches to bedrock, lithic

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Hot Desert Shrub
Ecological site number: R042XG264TX
Typical vegetation: Chino grama, black grama, perennial forbs, sideoats grama, triden, feathery dalea, Arizona cottontop, tanglehead, range ratany, cenizo, leatherstem, skeletonleaf goldeneye, other shrubs, other annual forbs

Rock outcrop

Landforms: Mountains, hills
Geomorphic positions, three-dimensional: Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Rhyolite and/or trachyte

Typical Profile

R—0 to 10 inches; rhyolite bedrock

Properties and Qualities

Slope: 20 to 60 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

TEA—Tenneco-Bodecker complex, 0 to 3 percent slopes, flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches

Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 85 percent
Tenneco and similar soils: 70 percent
Bodecker and similar soils: 15 percent
Minor components: 15 percent
Unnamed soils occur throughout the unit: 9 percent
Riverwash occurs along the channel of drainages: 5 percent
Unnamed hydric soils occur on lower positions along the channels: 1 percent

Major Component Descriptions

Tenneco

Landforms: Flood-plain steps
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline silt loam
Bw—3 to 28 inches; moderately alkaline silt loam
Bk—28 to 80 inches; moderately alkaline gravelly clay loam

Properties and Qualities

Slope: 0 to 3 percent
Depth to first restrictive layer: No restrictive layer
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 9.8 inches (high)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Rare

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC250TX
Typical vegetation: Blue grama, black grama, burrograss, other perennial grasses, tobosa, sideoats grama, other forbs, Arizona cottontop, plains bristlegrass, bush muhly, cane bluestem, other shrubs, tarbush

Bodecker Taxadjunct

Landforms: Flood plains
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Sandy and gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 8 inches; moderately alkaline loam
Bw—8 to 14 inches; moderately alkaline loam
2C1—14 to 35 inches; moderately alkaline very gravelly coarse sand
2C2—35 to 80 inches; moderately alkaline gravelly sandy clay loam

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 1 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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 5.7 inches (low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Arroyo, Desert Grassland
Ecological site number: R042XC749TX
Typical vegetation: Western honey mesquite, desert willow, sideoats grama, littleleaf sumac, whitebrush, catclaw acacia, Apache plume, cane bluestem, sand dropseed, alkali sacaton, giant sacaton, creosotebush, plains bristlegrass, baccharis

TRE—Terlingua-Rock outcrop complex, 3 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains, hills
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 95 percent
Terlingua and similar soils: 70 percent
Rock outcrop and similar soils: 25 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Major Component Descriptions

Terlingua

Landforms: Mountains, hills
Geomorphic positions, two-dimensional: Summit, shoulder, backslope

Geomorphic positions, three-dimensional: Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from basalt

Typical Profile

A—0 to 9 inches; moderately alkaline very gravelly sandy loam
R—9 to 19 inches; igneous bedrock

Properties and Qualities

Slope: 3 to 30 percent
Percent of area covered by surface fragments: About 80 percent subrounded gravel, about 10 percent subrounded cobbles, about 10 percent subrounded stones
Depth to first restrictive layer: 4 to 14 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.6 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Basalt Hill, Hot Desert Shrub
Ecological site number: R042XG263TX
Typical vegetation: Chino grama, creosotebush, leatherstem, other perennial forbs, other shrubs, tanglehead, lechuguilla, whitethorn acacia, range ratany, ocotillo, other perennial grasses, triden, sideoats grama, black grama, threeawn, fluffgrass, spiderling grass

Rock outcrop

Landforms: Mountains, hills
Parent material: Basalt

Typical Profile

R—0 to 10 inches; basalt bedrock

Properties and Qualities

Slope: 15 to 30 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 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
Flooding frequency: None

Interpretive Groups

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

TRG—Terlingua-Rock outcrop complex, 20 to 70 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Hills, mountains
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Composition

Major components: 95 percent
Terlingua and similar soils: 65 percent
Rock outcrop and similar soils: 30 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Major Component Descriptions

Terlingua

Landforms: Hills, mountains
Geomorphic positions, two-dimensional: Summit, shoulder, backslope
Geomorphic positions, three-dimensional: Mountainflank, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from basalt

Typical Profile

A—0 to 13 inches; moderately alkaline very gravelly coarse sandy loam
R—13 to 23 inches; basalt bedrock

Properties and Qualities

Slope: 20 to 60 percent
Percent of area covered by surface fragments: About 6 percent angular stones, about 16 percent angular cobbles, about 52 percent angular gravel
Depth to first restrictive layer: 4 to 14 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 0.6 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Igneous Hill and Mountain, Hot Desert Shrub (fig. 34)
Ecological site number: R042XG264TX
Typical vegetation: Chino grama, black grama, perennial forbs, sideoats grama, triden, feathery dalea, Arizona cottontop, tanglehead, range ratany, cenizo, leatherstem, skeletonleaf goldeneye, other shrubs, other annual forbs

Rock outcrop

Landforms: Ledges on hills, free faces on hills, ledges on mountains, free faces on mountains
Geomorphic positions, two-dimensional: Backslope
Geomorphic positions, three-dimensional: Mountainflank
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Basalt

Typical Profile

R—0 to 10 inches; basalt bedrock

Properties and Qualities

Slope: 20 to 70 percent
Depth to first restrictive layer: 0 to 4 inches to bedrock, lithic
Slowest permeability from first cemented restrictive layer to 60 inches: 0.001 to 0.06 in/hr (very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline

Figure 34.—Very sparse vegetation cover on the Terlingua soils in an area of Terlingua-Rock outcrop complex, 20 to 70 percent slopes. The dark color of surface fragments and exposed basalt bedrock absorb solar radiation, which results in very hot soil temperatures during the summer. Terlingua soils are in the Igneous Hill and Mountain ecological site, Hot Desert Shrub vegetative zone of MLRA 42—Southern Desertic Basins, Plains, and Mountains.

Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Flooding frequency: None

Interpretive Groups

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

VAA—Verhalen silty clay, 0 to 2 percent slopes, rarely flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition

Major components: 80 percent
Verhalen and similar soils: 80 percent
Minor components: 20 percent
Chispa soils have a fine-loamy control section and occur on slightly higher positions: 10 percent
Unnamed soils occur throughout the unit: 10 percent

Major Component Descriptions

Verhalen

Landforms: Alluvial flats
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 7 inches; moderately alkaline silty clay
Bss—7 to 54 inches; moderately alkaline silty clay
2BC—54 to 64 inches; moderately alkaline extremely gravelly clay
3BC and 3BCk—64 to 80 inches; moderately alkaline silty clay

Properties and Qualities

Slope: 0 to 2 percent
Depth to first restrictive layer: No restrictive layer
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: Low
Flooding frequency: Rare

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Clay Flat, Desert Grassland
Ecological site number: R042XC241TX
Typical vegetation: Tobosa, blue grama, other perennial grasses, vine mesquite, cane bluestem, other forbs, ear muhly, bristlegrass

VCA—Vicente, Lomapelona, and Castolon soils, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: River valleys (fig. 35)
Elevation: 1,800 to 3,995 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Figure 35.—The scarps of Corazones soils rise above the Rio Grande flood plain. Mapped along the Rio Grande flood plain is Vicente, Lomapelona, and Castolon soils, 0 to 1 percent slopes, occasionally flooded. Most of the vegetation seen along the river is salt cedar which has infested much of the area. The mountains in the background are in the Republic of Mexico.

Composition

Major components: 84 percent
- Vicente and similar soils: 30 percent
- Lomapelona and similar soils: 29 percent
- Castolon and similar soils: 25 percent

Minor components: 16 percent
- Water in the Rio Grande: 7 percent
- Galindo soils have a clayey control section in the upper part and occur on slightly lower positions: 4 percent
- Unnamed soils occur throughout the unit: 4 percent
- Unnamed hydric soils occur on slightly lower positions: 1 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Vicente

Landforms: Flood plains
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

Ap—0 to 9 inches; moderately alkaline loam
C—9 to 80 inches; moderately alkaline clay loam, loam, and silt loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: No restrictive layer
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 10.8 inches (high)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: 2w
Ecological site name: Loamy Bottomland, Hot Desert Shrub
Ecological site number: R042XG733TX
Typical vegetation: Giant sacaton, alkali sacaton, other shrubs, other perennial grasses, other trees, fourwing saltbush, tarbush, cottonwood, cane bluestem, sideoats grama, false Rhodes grass, western honey mesquite, plains bristlegrass, white triden, pink pappusgrass, other perennial forbs, spiny aster, other annual forbs.

Lomapelona

Landforms: Flood plains
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

Ap—0 to 6 inches; moderately alkaline loam
C1—6 to 11 inches; moderately alkaline loam
C2—11 to 39 inches; moderately alkaline very fine sandy loam
C3—39 to 80 inches; moderately alkaline fine sandy loam

Properties and Qualities

Slope: 0 to 1 percent
Percent of area covered by surface fragments: About 1 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer
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 9.2 inches (high)
Natural drainage class: Moderately well drained
Runoff: Negligible
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: 2w
Ecological site name: Loamy Bottomland, Hot Desert Shrub
Ecological site number: R042XG733TX
Typical vegetation: Giant sacaton, alkali sacaton, other shrubs, other perennial grasses, other trees, fourwing saltbush, tarbush, cottonwood, cane bluestem, sideoats grama, false Rhodes grass, western honey mesquite, plains bristlegrass, white triden, pink pappusgrass, other perennial forbs, spiny aster, other annual forbs

Castolon

Landforms: Flood plains
Geomorphic positions, two-dimensional: Toeslope
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 11 inches; moderately alkaline silty clay loam
C1—11 to 23 inches; moderately alkaline silty clay loam
C2—23 to 80 inches; moderately alkaline silt loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: No restrictive layer
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: Saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 12.0 inches (very high)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: 2w
Ecological site name: Loamy Bottomland, Hot Desert Shrub
Ecological site number: R042XG733TX
Typical vegetation: Giant sacaton, alkali sacaton, other shrubs, other perennial grasses, other trees, fourwing saltbush, tarbush, cottonwood, cane bluestem, sideoats grama, false Rhodes grass, western honey mesquite, plains bristlegrass, white triden, pink pappusgrass, other perennial forbs, spiny aster, other annual forbs.

VOC—Volco and Pardo soils, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,500 to 6,695 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition

Major components: 90 percent
Volco and similar soils: 45 percent
Pardo and similar soils: 45 percent
Minor components: 10 percent
Brewster soils do not have a calcic or petrocalcic horizon and occur on similar positions: 5 percent
Rock outcrop: 5 percent

This map unit is an undifferentiated group. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. The representative value percentages listed above are the result of transect analyses for the entire extent of this map unit, but may not represent any given delineation.

Major Component Descriptions

Volco

Landforms: Mesas
Geomorphic positions, two-dimensional: Summit, shoulder

Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from basalt and/or ignimbrite

Typical Profile

A—0 to 5 inches; moderately alkaline very gravelly loam
Bk—5 to 18 inches; moderately alkaline very gravelly loam
R—18 to 28 inches; ignimbrite bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 2 percent angular stones, about 11 percent angular cobbles, about 63 percent angular gravel
Depth to first restrictive layer: 6 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.6 inches (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Basalt Hill, Mixed Prairie
Ecological site number: R042XE695TX
Typical vegetation: Black grama, sideoats grama, blue grama, other perennial grasses, other perennial forbs, tanglehead, cane bluestem, plains lovegrass, wolftail, Arizona cottontop, other shrubs, sacahuista, javelinabush, feather dalea

Pardo

Landforms: Mesas
Geomorphic positions, two-dimensional: Summit, shoulder
Geomorphic positions, three-dimensional: Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum and/or colluvium derived from basalt and/or ignimbrite

Typical Profile

A—0 to 5 inches; moderately alkaline gravelly clay loam
Bk—5 to 15 inches; moderately alkaline very gravelly clay loam and very gravelly loam
Bkkm—15 to 18 inches; cemented material
R—18 to 28 inches; ignimbrite bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 20 percent subangular cobbles, about 58 percent subangular gravel

Depth to first restrictive layer: 6 to 18 inches to bedrock, petrocalcic; 8 to 20 inches to bedrock, lithic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability from first cemented restrictive layer to 60 inches: 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 1.8 inches (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Shallow, Mixed Prairie
Ecological site number: R042XE281TX
Typical vegetation: Black grama, blue grama, sideoats grama, cane bluestem, other perennial grasses, green sprangletop, plains lovegrass, plains bristlegrass, other perennial forbs, other shrubs, hairy grama, sacahuista, redberry juniper, feathery dalea, other trees

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.

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. In addition, 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, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for rangeland; 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, and lawns.

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 verbal 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 *unsuited* 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 1.0. 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

Prepared by David Embry, Agronomist, and Cliff Kinnibrugh, District Conservationist, Natural Resources Conservation Service.

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

Planners of management systems for individual fields or farms should consider the detailed information given 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 Texas AgriLife Extension Service.

Presidio County has approximately 1,000 acres of irrigated cropland along the Rio Grande. This is a very small amount of Presidio County which encompasses over 2.4 million acres. The main crops are alfalfa and forage sorghum. Oats and rye are also grown as cover crops and are sometimes used for grazing or haying.

The cropped area of the Rio Grande flood plain was once a major agriculture producing area from the early 1900’s up to the late 90’s. There were approximately 9,000 acres of irrigated cropland in which crops such as cotton, cantaloupe, watermelons, squash, spinach, onions, wheat, oats, corn, and grain sorghum were grown.

The agricultural economy in Presidio County continues to decline because of, recurring levee failure, encroachment of salt cedar, high salinity and inconsistent irrigation water supplies. There is no dryland farming in Presidio County because of the lack of sufficient rainfall. The suitability of each soil for use as cropland is indicated by the capability classification given at the end of each map unit description in the section “Detailed Soil Map Units.”

Land Capability Classification

Table 11 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. Capability classes are listed for each map unit in the section “Detailed Soil Map Units”.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 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, 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, 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, rangeland, forestland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

Rangeland

Prepared by Michael Margo, Rangeland Management Specialist, Natural Resources Conservation Service

Rangelands, a broad category of land comprising more than 40 percent of the earth's land area, are characterized by native plant communities and are managed by ecological, rather than agronomic methods. Important uses of rangelands include livestock grazing, wildlife management, recreation, water management, and management of aesthetic value.

Approximately 99 percent, or 2.4 million acres, of Presidio County is rangeland. Less than one percent is cultivated for either cropland or pastureland. Presidio County rangelands are used mostly for livestock grazing, wildlife habitat, andr recreation. Most ranches are cow-calf operations that produce stocker calves for fall delivery. When additional forage is produced, stocker calves may be raised for later markets. Wildlife habitat as a land use is discussed in the "Wildlife Habitat" section.

The Natural Resources Conservation Service divides rangelands into ecological sites for the purposes of inventory, evaluation, and management. An ecological site is defined as a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. An ecological site is the product of all the environmental factors responsible for its development, and it has a set of key characteristics that are included in the ecological site description such as characteristic soils. Ecological sites incorporate state and transition models to describe the succession of community phases and ecological processes that affect the site and they are classified according the potential native plant community, or reference plant community, which develops under natural conditions.

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, erosion, and plowing. Grazing animals select the most palatable plants. These plants will eventually die if they are continually grazed at a severity that does not allow for recovery. Under these conditions, less desirable plants, such as annuals and weed-like plants can increase. Usually, these degradation processes (also called retrogression) take place over many years. If the plant community and soils have not degraded significantly, high quality native plants may return, with proper grazing management.

The Natural Resources Conservation Service and other agencies assist landowners in identifying problems and concerns, as well as opportunities to maintain or improve their rangeland resources. A rangeland ecological site may be evaluated by three distinct methods: similarity index, rangeland trend, and rangeland health.

A similarity index is a comparison of the present plant community to the historic climax plant community. A similarity index is the percentage, by weight, of historic climax vegetation that is found in the present plant community. This index provides an indication of past disturbance as well as potential for improvement.

Rangeland trend determinations assess the direction of change occurring in the present plant community compared to the historic climax plant community. The plant community may be either moving toward or away from the historic climax plant community. This rating provides information to landowner regarding the direction of change in plant community in response to present management.

Rangeland health is a determination of how the ecological processes on a rangeland ecological site are functioning. Ecological processes evaluated include water cycle, nutrient cycle, and energy flow.

How rangeland is managed affects forage production, species composition, plant health, and the ability of the vegetation to protect the soil. Rangeland management requires knowledge of the kinds of soil and of the historic climax plant community. Effective range management conserves rainfall, enhances water quality, reduces the hazard of downstream flooding, improves yields, provides forage for livestock and wildlife, enhances recreational opportunities, and protects the soil.

The primary range management practices used in Presidio County include prescribed grazing, stock-water developments, and fences. If undesirable plants become dominant, brush management is commonly used.

Knowledge of the ecological site is necessary as a basis for planning and applying the management needed to maintain or improve the desired plant community for selected uses. Such information is needed to support management objectives, develop planned grazing systems and stocking rates, determine suitable wildlife management practices, evaluate the potential for recreational uses, and determine the condition of watersheds.

Native vegetation varies considerably throughout the County because of significant differences in climate, soils, and topography. Three major vegetative zones that coincide with major climatic breaks have been identified in Presidio County: 1) Hot Desert Shrub, 2) Desert Grassland, and 3) Mixed Prairie. Approximately 75 percent of the annual production of plants occurs in the months of June through September responding to summer rains. Droughts are very common and low, inconsistent rainfall combined with high evaporation rates cause a depletion in soil moisture with a corresponding decrease in production.

Growth of native vegetation in Presidio County is quite variable because of large variations in annual and seasonal rainfall. Droughts are very common. Low, inconsistent rainfall combined with high evaporation rates cause a depletion in soil moisture with a corresponding decrease in forage production. Grazing management should be flexible and closely correlated to plant growth curves and to fluctuations in seasonal and annual forage production.

A typical growth curve for native vegetation representing the percentage of total growth occurring each month for the Hot Desert Shrub vegetative zone 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

A typical growth curve for native vegetation representing the percentage of total growth occurring each month for the Desert Grassland vegetative zone 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

A typical growth curve for native vegetation representing the percentage of total growth occurring each month for the Mixed Prairie vegetative zone 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

These growth curves show that in Presidio County, depending on the vegetative zone, approximately 85 percent of the annual production of forage occurs in the months of April through September responding to summer rains.

Table 12 shows, for each soil that supports rangeland vegetation, the ecological site and the total dry-weight production of vegetation in favorable, normal, and unfavorable years. An ecological site and the assigned vegetative or climatic zone are indicated for each soil.

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.

The total dry-weight production is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as stage of maturity, exposure, amount of shade, recent rains, and unseasonable dry periods.

Rangeland Management

Prescribed Burning. Prescribed burning is a restoration practice that is primarily designed to help return the natural fire cycle to the landscape. Properly carried out on suitable sites, burning can be a very effective and cost efficient treatment method to help restore the desired composition of plant species in an ecological site, improve livestock access on heavy brush or slash sites, rejuvenate sprouting browse species and stagnant grass plants, release nutrients into the soil, improve palatability and nutrient content of forage, reduce fuel loading, and prepare an ash seedbed for artificial or natural seeding. Burning may be combined with mechanical or chemical rangeland treatments.

Fuel ignition can be natural or artificial using hand-held drip torches, aerial ignition, and other methods. Fire lines can be natural fuel breaks, wet-line techniques, hand constructed, or machinery constructed.

The *prescribed burning* interpretive ratings found in Table 13, represent the relative limitations of soil and physiographic factors upon the ability to safely contain the fire, soil,

and climatic factors upon the ability to obtain a favorable vegetative response to the treatment, and the risk of water and wind erosion prior to re-establishing adequate watershed cover on the treatment site.

Prescribed burning should be carefully planned and executed. It should be carried out following a well-designed prescription and burn plan under the supervision of a qualified prescribed burning team. Burning objectives should be clearly defined and should be evaluated during post-burn assessments. Minimizing risks to human health, safety, and property damage and containment of the burn are of paramount importance. Fire mortality susceptibility of desirable plants also needs to be taken into consideration during prescribed burning planning.

This grazing lands interpretation provides a tool for rangeland and grazing management. Soils vary in their capacity to support various rangeland habitats and to produce desirable forage and carrying capacities. The use and management of soils for rangeland practices is directly dependent on individual soil properties and characteristics and those required by the management practice. The interpretive ratings are designed to provide the user with information about the presence of soil properties or characteristics that may limit use and management for a specific rangeland practice. They also guide the user in predicting how the soil will respond to the management practice. The interpretive ratings are for the soils in their natural condition and do not consider present land use, existing vegetation, and water sources. During site evaluation and planning, however, these items should be considered.

The degree of limitation is expressed as a numeric index between 0 (non-limiting condition) and 1.0 (limiting condition). If an individual soil property within 60 inches (150 cm) of the soil surface has a degree of limitation greater than zero, then that soil property is limiting and the soil restrictive feature is identified. The overall interpretive rating assigned is the maximum degree of limitation of each soil property that is considered in the rating process. Lesser restrictive soil features are those that have a degree of limitation less than the maximum, and they are identified to provide the user with additional information about the soil's capability to support the specific land use. These lesser restrictive features could be important factors where the major restrictive features are overcome through proper design and installation.

Soils are placed into interpretive rating classes depending on their degree of limitation. These classes are "not limited" (degree of limitation = 0), "somewhat limited" (degree of limitation > 0 and < 1.0), or "very limited" (degree of limitation = 1.0).

Soils that are rated "not limited" have no restrictions for prescribed burning. A "somewhat limited" rating implies that the soil has features that may impede prescribed burning. A "very limited" rating indicates that the soil characteristics are such that they limit or prohibit prescribed burning.

Low precipitation, steep slopes, low available water capacity, water erosion, and wind erosion reduce the probability of re-establishing rangeland vegetation.

The soil interpretive ratings for ranch access roads are found in Table 14, provide the user with information about the presence of soil properties or characteristics that may limit use and management for a specific rangeland practice. They also guide the user in predicting how the soil will respond to the management practice. The interpretive ratings are for the soils in their natural condition and do not consider present land use, existing vegetation, and water sources. During site evaluation and planning, however, these items should be considered.

Ranch Access Roads. Ranch access roads are those used for driving rubber tired vehicles, walking, horseback riding, and similar uses that require minimal cutting or filling. The soils are rated based on the properties and qualities that influence trafficability and erodibility. Many soil survey areas in sparsely populated parts of the County have soil surveys of lower intensity. While some general observations may be made, onsite evaluation is required before the final site is selected.

This grazing lands interpretation provides a tool for rangeland and grazing management. Soils vary in their capacity to support various rangeland habitats and to produce desirable forage and carrying capacities. The use and management of soils for numerous rangeland practices is directly dependent on individual soil properties and characteristics and those required by the management practice.

The degree of limitation is expressed as a numeric index between 0 (non-limiting condition) and 1.0 (limiting condition). If an individual soil property within 60 inches (150 cm) of the soil surface has a degree of limitation greater than zero, then that soil property is limiting and the soil restrictive feature is identified. The overall interpretive rating assigned is the maximum degree of limitation of each soil property that is considered in the rating process. Lesser restrictive soil features are those that have a degree of limitation less than the maximum, and they are identified to provide the user with additional information about the soil's capability to support the specific land use. These lesser restrictive features could be important factors where the major restrictive features are overcome through proper design and installation.

Soils are placed into interpretive rating classes depending on their degree of limitation. These classes are "not limited" (degree of limitation = 0), "somewhat limited" (degree of limitation > 0 and < 1.0), or "very limited" (degree of limitation = 1.0).

Soils that are rated "not limited" have no restrictions for ranch access roads. A "somewhat limited" rating implies that the soil has features that may impede construction and maintenance of ranch access roads. A "very limited" rating indicates that the soil characteristics are such that they limit or prohibit the construction or maintenance of ranch access roads.

Soil properties and qualities considered in rating the degree of limitation are those that influence the ease of building access roads and the performance of access roads after development. Stoniness, wetness, texture of the surface layer, slope, flooding, erodibility, and, in dry regions, dustiness are the main concerns in developing access roads. For good trafficability, the surface of a path or trail should absorb rainfall readily, remain firm under heavy traffic, and not be dusty when dry.

The soil interpretations for livestock watering pipelines and fencing depths shown in Table 15, are used as a tool in evaluating soil suitability and identifying soil limitations for the practice. The rating is for soils in their present condition and does not consider present land use. Soils that are rated "*not limited"* have no restrictions for pipeline installation. A "*somewhat limited"* rating implies that the soil has features that may impede pipeline installation. A "*very limited"* rating indicates that the soil characteristics are such that they limit or prohibit pipeline installation.

Ratings are based on the soil properties that influence ease of digging and resistance to sloughing. Depth to bedrock or cemented pan, hardness of bedrock or a cemented pan, and the amount of large stones influence the ease of digging, filling, and compacting. Depth to the seasonal high water table and flooding may restrict the period when pipeline can be installed. Slope influences the ease of using machinery. Soil texture and depth to water table influence the resistance to sloughing.

Livestock Water Pipeline (Plastic). Livestock watering pipeline are installed using narrow, shallow trenches at a maximum depth of 2 feet. The excavations are most commonly made by trenching machines or plows. Soil properties influence the development of construction sites, including the selection of the site, the design of the structure, construction, performance, and after construction maintenance.

Fencing, Post Depth =<24 inches. Fencing is the construction and maintenance of barriers for the management of animals and people. Fences are constructed using metal or wooden posts. This interpretation was developed for conditions where the posts are set to a depth of 2 feet or less into the soil with strands of wire suspended between the posts. This interpretation is used to rate the ease of setting posts, maintaining the wire tension, and estimating the replacement and maintenance cost. Excavations for wooden posts are made by power auger or hand dug, metal posts are driven into the soil.

Table 15 is of a general nature and identifies soil features that may restrict the installation of fence posts to a depth of 24 inches. It is designed to be used in the planning process to identify areas of concern prior to installing fencing. Soil features that may impede digging, setting, and maintenance of fencing are identified and guide the user in fence design, construction, and maintenance considerations. Soils that are rated "*not limited"* have no restrictions for setting fence posts within a depth of 24 inches. A "*somewhat limited"* rating implies that the soil has features within a depth of 24 inches that may impede digging or setting fence posts or fence maintenance. "A *very limited"* rating indicates that the soil characteristics within a depth of 24 inches are such that they limit fence post digging or setting or fence maintenance.

Bedrock, cemented pan, and large and small stones influence the excavation of post holes and the driving of posts. Flooding and depth to a seasonal high water table may restrict the season of construction. Flooding also affects maintenance and replacement cost. High water tables raise the maintenance cost and require deeper post settings. High shrink-swell soils require deep post settings or rock jacks to maintain vertical post alignment. Post alignment and maintaining the desired wire tension are often difficult on sandy soils because of their low strength. Soil blowing causes maintenance problems. Frost action results in frost-heaving of the posts. Steep slopes affect the use power augers and the delivery of supplies. During the wet seasons, surface creep on steep slopes may increase maintenance cost. Soil reaction and salinity affect the type of post selected and maintenance costs.

Fencing, Post Depth =<36 inches. Fencing is the construction and maintenance of barriers for the management of animals and people. Fences are constructed using metal or wooden posts. This interpretation was developed for conditions where the posts are set to a depth of 3 feet or less into the soil with strands of wire suspended between the posts. This interpretation is used to rate the ease of setting posts, maintaining the wire tension, and estimating the replacement and maintenance cost. Excavations for wooden posts are made by power auger or hand dug, metal posts are driven into the soil.

Table 15 shows the general nature and identifies soil features that may restrict the installation of fence posts to a depth of 36 inches. It is designed to be used in the planning process to identify areas of concern prior to installing fencing. Soil features that may impede digging, setting, and maintenance of fencing are identified and guide the user in fence design, construction, and maintenance considerations. Soils that are rated "*not limited"* have no restrictions for setting fence posts within a depth of 24 inches. A "*somewhat limited"* rating implies that the soil has features within a depth of 36 inches that may impede digging or setting fence posts or fence maintenance. A "*very limited"* rating indicates that the soil characteristics within a depth of 36 inches are such that they limit fence post digging or setting or fence maintenance.

Bedrock, cemented pan, and large and small stones influence the excavation of post holes and the driving of posts. Flooding and depth to a seasonal high water table may restrict the season of construction. Flooding also affects maintenance and replacement cost. High water tables raise the maintenance cost and require deeper post settings. High shrink-swell soils require deep post settings or rock jacks to maintain vertical post alignment. Post alignment and maintaining the desired wire tension are often difficult on sandy soils because of their low strength. Soil blowing causes maintenance problems. Frost action results in frost-heaving of the posts. Steep slopes affect the use power augers and the delivery of supplies. During the wet seasons surface creep on steep slopes increases maintenance costs. Soil reaction and salinity affect the type of post selected and maintenance costs.

Ecological Sites

A total of 30 ecological sites have been identified in Presidio County. The following are general descriptions of Major Land Resource Areas (MLRA) and ecological sites occurring within Presidio County. MLRA 42 is subdivided into three vegetative zones

based on climate. The composition of the reference plant community by weight is given for each site. A brief description on plant community dynamics is also provided.

MLRA 81D – Southern Edwards Plateau

The Southern Edwards Plateau land resource area is located in the southeastern part of the county along the Rio Grande and is restricted to Cretaceous aged Limestone Geology. The climate and soils support a sparse stand of grasses and shrubs characteristic of the Chihuahuan Desert.

The climax vegetation is mainly drought tolerant grasses and shrubs. Some of the characteristic vegetation includes chino grama, false grama, triden, black grama, creosotebush, lechuguilla, candelilla, and dogweed.

Flagstone Hill 8-14" PZ. This ecological site group includes soil map unit; the Mariscal part of MDE—Mariscal-Rock outcrop complex, 10 to 30 percent slopes. (fig. 36)

This site occurs on strongly sloping to steep hills of dissected plateaus. Soils are shallow and formed in residuum and colluvium weathered from flaggy limestone. The climax vegetation consists of drought tolerant bunchgrasses, intermixed with occasional woody shrubs and forbs.

The characteristic vegetation consists of approximately 40 percent chino grama; 20 percent triden and perennial threeawn; 10 percent black grama and bush muhly; 10

Figure 36.—Mariscal soils formed in residuum weathered from flaggy limestone of the Cretaceous age Boquillas Formation. The Flagstone Hills ecological site of MLRA 81D—Southern Edwards Plateau, supports creosotebush, feather dalea, and Chino grama.

percent other perennial grasses; 8 percent desert myrtlecroton, skeletonleaf goldeneye, guayacan, and cenizo; 3 percent feather dalea, candelilla, and creosotebush; 4 percent other shrubs; and 5 percent forbs. Under continuous heavy grazing species such as fluffgrass, creosotebush, whitethorn acacia, dogweed, and lechuguilla increase while black grama, menodora, and other palatable plants decrease. Chino grama initially increases and as retrogression continues it begins to decrease and bare ground increases. Because of low rainfall, extremely high summer soil temperatures, and droughty soils, recovery of depleted ranges are extremely slow.

Limestone Hill and Mountain 8-14" PZ. This ecological site group includes soil map units; the Blackgap part of BLE—Blackgap-Rock outcrop complex, 10 to 30 percent slopes (fig. 37); and the Blackgap part of BLG—Blackgap-Rock outcrop complex, 20 to 70 percent slopes.

This site occurs on gently sloping to very steep hills and mountains. Soils are very shallow to very shallow that formed in loamy residuum over limestone bedrock. The climax plant community consists of short and mid grasses intermixed with shrubs and forbs.

The characteristic vegetation consists of approximately 40 percent Chino grama; 10 percent black grama; 6 percent sideoats grama; 2 percent triden; 12 percent other perennial grasses; 10 percent cenizo, guayacan, and creosotebush; 6 percent ocotillo and lechuguilla candelilla; 6 percent other shrubs; and 8 percent forbs. Under heavy continuous grazing, creosotebush, lechuguilla, and other shrubs slowly increase. Species such as fluffgrass, dogweed, coldenia, croton, and paperflower replace many of the climax grasses. Total vegetative cover is greatly reduced and soil erosion is accelerated.

Figure 37.—An area of Blackgap-Rock outcrop complex, 10 to 30 percent slopes. Vegetation consists of Chino grama, blind pricklypear, leatherstem, ocotillo, and Texas false agave. Blackgap soils are in the Limestone Hill and Mountain ecological site in MLRA 81D—Southern Edwards Plateau.

MLRA 42—Southern Desertic Basins, Plains, and Mountains

Hot Desert Shrub Vegetative Zone

The Hot Desert Shrub Vegetative Zone occurs along the Rio Grande and is located within the lowest elevations (2,300 to 3,600 feet) of the county. Mean annual precipitation ranges from 10 to 13 inches and occurs predominantly during the hot summer months as high intensity storms. Consequently, effective precipitation for plant growth is low. Soils are classified as hyperthermic (mean annual soil temperature to a depth of 20 inches or a lithic contact, is more than 72 degrees F). Air temperatures above 100 degrees F are common throughout the summer. With the exception of flood plains and drainages, this climate supports a sparse cover of vegetation that is characteristic of the Chihuahuan Desert. The majority of this vegetative zone is not suited for common rangeland improvement practices such as seeding, brush control, and/or prescribed fire.

In general, vegetation consists mostly of drought tolerant shrubs, cacti, and perennial grasses, generally in a widely spaced pattern with an abundance of barren soil or desert pavement among them. Characteristic perennial plants include chino grama, false grama, fluffgrass, creosotebush, whitethorn acacia, ocotillo, yucca, lechuguilla, leatherstem, candelilla, and cacti.

Arroyo, Hot Desert Shrub. This ecological site group includes soil map units; the Pantera part of BAC—Baviza-Pantera complex, 1 to 8 percent slopes, flooded; the Pantera part of MPB—Melado-Pantera soils, 1 to 5 percent slopes; and the Pantera part of RIA—Riverwash and Pantera soils, 0 to 2 percent slopes, frequently flooded.

This site occurs on nearly level to moderately sloping arroyos, drainageways, and stream terraces. Soils are very deep, well drained, and formed in loamy and gravelly alluvium. Occasional to frequent flash floods occur within this site causing instability of plant communities along and within incised channels. Species composition is diverse and varies with landform and depth to ground water.

The site is mostly dominated by short and mid grasses, shrubs, and a few deciduous trees. The composition by weight of the reference plant community is about 20 percent sideoats grama, tanglehead, cane bluestem, and black grama; 7 percent sand dropseed and whiplash pappusgrass; 5 percent chino grama; 8 percent other perennial grasses; 10 percent western honey mesquite; 8 percent creosotebush; 10 percent desert willow and catclaw acacia; 9 percent elbowbush, spiny hackberry, and Warnock's condalia; 12 percent other shrubs; 5 percent croton; 5 percent other forbs; 1 percent cottonwood.

Continuous heavy grazing by cattle on this site will result in a decrease in black grama, sideoats grama, tanglehead, and cane bluestem while fluffgrass, threeawn, triden, and annual forbs will increase. Eventually all grasses will decrease with prolonged continuous heavy grazing. Loss of deep rooted perennial grasses could cause stream channel instability and soil erosion. Shrubs that typically increase are western honey mesquite, creosotebush, and acacias. Palatable shrubs and forbs such as range ratany, skeletonleaf goldeneye, menodora, guara, and milkwort will also decrease with continuous heavy grazing by all classes of livestock especially sheep and goats. Because the site receives run in surface water, recovery of palatable plants is possible with no grazing or prescribed grazing. However the rate or probability of recovery will depend on the extent to which the site was disturbed.

Basalt Hill, Hot Desert Shrub. This ecological site group includes soil map unit; the Terlingua part of TRE—Terlingua-Rock outcrop complex, 3 to 30 percent slopes. (fig. 38)

This site occurs on gently sloping to strongly sloping hills. Soils are shallow to very shallow and formed in material weathered from extrusive igneous bedrock. This site has a climax plant community of drought tolerant woody shrubs and infrequent drought tolerant short and mid grasses and perennial forbs.

The characteristic vegetation consists of approximately 15 percent chino grama, 8 percent tanglehead and sideoats grama; 7 percent triden and black grama; 3

Figure 38.—Very sparse vegetation cover on Terlingua-Rock outcrop complex, 10 to 30 percent slopes. Leatherstem, creosotebush, and scattered plants grow on this thin soil, which is very shallow to basalt bedrock. Limited water storage capacity because of the shallow depth, and hot soil temperatures resulting from dark colored surface fragments combine to make this a very harsh environment for plants. The Terlingua soils are in the Basalt Hill ecological site, Hot Desert Shrub vegetative zone of MLRA 42—Southern Desertic Basins, Plains, and Mountains.

percent threeawn; 7 percent other grasses; 15 percent creosotebush; 18 percent leatherstem, ocotillo, and lechuguilla; 5 percent range ratany; 12 percent other shrubs; 2 percent spiderling grass and plains blackfoot; 8 percent other forbs.

Under continuous heavy grazing by livestock, black grama, sideoats grama, tanglehead will decrease while threeawn, slim triden, fluffgrass, and annual forbs increase. Eventually all grasses except fluffgrass decrease with prolonged continuous heavy grazing. Palatable shrubs and forbs such as range ratany, menodora, and milkwort will also decrease or loose vigor. Because of low effective rainfall, extremely high summer soil temperatures, and very shallow rocky soils, recovery of grasses, palatable shrubs, and forbs on overgrazed rangeland is extremely slow if at all.

Clay Hill, Hot Desert Shrub. This ecological site group includes soil map unit; the Musgrave part of PIB—Paisano-Musgrave association, 1 to 5 percent slopes; and the Musgrave part of QBE—Quadria, Nolam, and Musgrave soils, 0 to 30 percent slopes. (fig. 39)

This site occurs on nearly level to gently sloping hill slopes, scarps, and eroded uplands. Soils are shallow to very shallow, fine textured, and formed in residuum derived from tuff (compacted volcanic ash). The reference plant community consists of predominantly drought tolerant mid and short grasses with scattered woody shrubs and occasional forbs.

The characteristic vegetation of the reference community consists of approximately 30 percent tobosa; 20 percent false grama; 15 percent sideoats grama, Arizona cottontop, and Chino grama; 5 percent other grasses; 8 percent western honey mesquite; 7 percent creosotebush and leatherstem; 7 percent other shrubs; 8 percent forbs.

The impact of improper grazing within this site specifically will lead to a decrease in grasses, reduction of fine litter, and the slow increase of some woody plants. Vegetation will shift from a mid grass to a short grass plant community and ultimately to a nonreversible shrub dominated state with isolated short grasses.

Figure 39.—Musgrave silty clay, in an area of QBE—Quadria, Nolam, and Musgrave soils, 0 to 30 percent slopes. The Musgrave soils are on low hills and are sparsely vegetated. Musgrave soils are in the Clay Hill ecological site, Hot Desert Shrub vegetative zone of MLRA 42—Southern Desertic Basins, Plains, and Mountains.

Gravelly, Hot Desert Shrub. This ecological site group includes soil map units; COC—Corazones-Ojinaga complex, 1 to 12 percent slopes (fig. 40); COE—Corazones-Ojinaga complex, 10 to 40 percent slopes; the Corazones and Ojinaga parts of GFF—Geefour-Corazones-Ojinaga association, 5 to 45 percent slopes; RCE—Redford and Corazones soils, 10 to 30 percent slopes; RCG—Redford and Corazones soils, 30 to 70 percent slopes; and STE—Strawhouse-Stillwell complex, 1 to 30 percent slopes;.

The site occurs on nearly level to moderately sloping inset fans and eroded remnants of piedmont slopes. Soils are very shallow to very deep soils that formed in gravelly alluvium derived mostly from igneous materials. The historic climax plant community consists of predominantly drought tolerant mid and short grasses with scattered woody shrubs and occasional forbs.

The characteristic vegetation consists of approximately 35 percent chino grama; 15 percent feather pappusgrass, triden, false grama; 5 percent perennial threeawn and fluffgrass; 5 percent other perennial grasses; 15 percent creosotebush; 10 percent ocotillo, lechuguilla, and leatherstem; 5 percent range ratany and Gregg's coldenia; 5 percent other shrubs; and 5 percent forbs.

Under heavy continuous grazing, creosotebush, lechuguilla, whitethorn acacia, and other shrubs may slowly increase in places. The desert climate limits their encroachment in most areas. Species such as fluffgrass, threeawn, dogweed, begin replacing palatable grasses. Chino grama is resilient on steep slopes probably because of inaccessibility to most livestock and/or increased infiltration capacity than nearly level slopes. The local climate limits the natural recovery of palatable grasses, shrubs, and forbs on over utilized areas.

Figure 40.—Corazones very gravelly sandy loam, in an area of Corazones-Ojinaga complex, 1 to 12 percent slopes. Vegetation consists of Chino grama, lechuguilla, creosotebush, and ocotillo. Corazones soils are in the Gravelly ecological site, Hot Desert Shrub vegetative zone of MLRA 42—Southern Desertic Basins, Plains, and Mountains. Lechuguilla is an indicator plant for the Chihuahuan Desert. Note the desert pavement.

Igneous Hill and Mountain, Hot Desert Shrub. This ecological site group includes soil map units; the Terlingua part of RED—Redlight and Terlingua soils and Rock outcrop, 5 to 35 percent slopes SUD—Studybutte very gravelly sandy clay loam, 5 to 30 percent slopes; the Studybutte part of SUG—Studybutte-Rock outcrop complex, 20 to 60 percent slopes; the Studybutte part of SUE—Studybutte-Rock outcrop complex, 10 to 30 percent slopes; and the Terlingua part of TRG—Terlingua-Rock outcrop complex, 20 to 70 percent slopes (fig. 41).

This site occurs on strongly sloping to very steep hills and mountains. Soils are shallow to very shallow and formed in residuum and colluvium weathered from igneous bedrock. The climax plant community consists of short and mid grasses, numerous shrubs, and frequent perennial forbs.

The characteristic plant community consists of approximately 30 percent chino grama; 10 percent black grama; 20 percent tanglehead, Arizona cottontop, sideoats grama and triden; 5 percent other perennial grasses; 20 percent feather dalea, skeletonleaf goldeneye, leatherstem, range ratany, and ocotillo; 5 percent other shrubs; 10 percent forbs.

Under heavy continuous grazing by sheep and goats, palatable shrubs, forbs, and grasses will reduce the amount and/or vigor of species such as range ratany, feather dalea, skeletonleaf goldeneye, menodora, guara, black grama, and tanglehead. Lechuguilla, creosotebush, pricklypear, fluffgrass, threeawn, and red grama increase in places. Chino grama seems to be fairly resistant and resilient to overgrazing on this site.

Figure 41.—Chino grama, leatherstem, ocotillo, lechuguilla, creosotebush, tasajillo, pricklypear, strawberry cactus, cholla, and woolly paperflower on an area of Terlingua-Rock outcrop complex, 20 to 70 percent slopes. Terlingua soils are in the Igneous Hill and Mountain, Hot Desert Shrub vegetative zone.

Limestone Hill and Mountain, Hot Desert Shrub. This ecological site group includes soil map unit; the Redlight part of RED—Redlight and Terlingua soils and Rock outcrop, 5 to 35 percent slopes.

This site occurs on gently sloping to very steep hills and mountains. Soils are very shallow to very shallow that formed in loamy residuum over limestone bedrock. The climax plant community consists of short and mid grasses intermixed with shrubs and forbs.

The characteristic vegetation consists of approximately 45 percent Chino grama; 15 percent black grama; 5 percent various tridens and fluffgrass; 5 percent other perennial grasses; 8 percent candelilla and creosotebush; 4 percent Big Bend silverleaf and ocotillo; 2 percent lechuguilla; 6 percent other shrubs; and 10 percent forbs. Under heavy continuous grazing, creosotebush, lechuguilla, and other shrubs slowly increase. Species such as fluffgrass, dogweed, coldenia, croton, and paperflower replace many of the climax grasses. Total vegetative cover is greatly reduced and soil erosion is accelerated

Loamy Bottomland, Hot Desert Shrub. This ecological site group includes soil map units; CAA—Castolon silty clay loam, 0 to 1 percent slopes, occasionally flooded; GAA—Galindo clay, 0 to 1 percent slopes, occasionally flooded; and VCA—Vicente, Lomapelona, and Castolon soils, 0 to 1 percent slopes, occasionally flooded.

This site occurs on the flood plain of the Rio Grande. Soils are very deep and formed in loamy and clayey alluvium from igneous and sedimentary rocks. Slope ranges from 0 to 3 percent. Species composition varies greatly in relation to degree and frequency of natural flood pulses. A wide variety of shrubs, trees, and grasses are common components of the climax plant community.

The presumed historical climax community probably consisted of approximately 25 percent giant sacaton; 10 percent alkali sacaton; 10 percent cane bluestem and whiplash pappusgrass; 5 percent vine mesquite and bristlegrass; 10 percent other perennial grasses; 15 percent western honey mesquite and cottonwood; 2 percent other trees; 8 percent fourwing saltbush, spiny hackberry, and catclaw acacia; 10 percent other shrubs; and 5 percent forbs.

Under continuous heavy grazing, midgrasses will decrease and burrograss, annual grasses, and annual forbs increase. Western honey mesquite and numerous shrubs greatly increase. Introduced species such as salt cedar, bermudagrass, and buffelgrass will displace native plants and dominate the site.

Loamy Sand, Hot Desert Shrub. This ecological site group includes soil map unit; the Baviza part of BAC—Baviza-Pantera complex, 1 to 8 percent slopes, flooded.

This site occurs on nearly level to strongly sloping alluvial fans. Soils are very deep, excessively drained, that formed in coarsely textured alluvium derived from igneous rock. The reference plant community consists of short and mid grasses, numerous shrubs, and frequent perennial forbs.

The reference plant community consists of approximately 40 percent sand, spike, and mesa dropseed; 10 percent black grama; 8 percent bush muhly; 4 percent threeawn and triden; 8 percent other grasses; 5 percent western honey mesquite; 5 percent creosotebush; 3 percent fourwing saltbush; 2 percent soaptree yucca; 5 percent other shrubs; 3 percent croton; and 7 percent other forbs.

Salty Clay Fan, Hot Desert Shrub. This ecological site group includes soil map unit; the Melado part of GMF—Geefour and Melado soils, 5 to 45 percent slopes; and the Melado part of MPB—Melado-Pantera soils, 1 to 5 percent slopes.

This site occurs on nearly level to strongly sloping alluvial flats. Soils are very deep and well drained that formed in clayey alluvium derived from gypsiferous, saline lacustrine deposits. A sparse community of drought tolerant shrubs and infrequent grasses characterizes this site.

The presumed historic climax plant community probably consisted of 25 percent creosotebush, 20 percent western honey mesquite; 15 percent tubercled saltbush; 10 percent fourwing saltbush; 10 percent alkali sacaton; 5 percent tobosa; 10 percent annual forbs and grasses; 3 percent other shrubs; and 2 percent perennial forbs. Under continuous heavy grazing alkali sacaton and tobosa will decrease while creosotebush and tubercled saltbush will slowly increase to a point. Annual grasses and forbs will increase in abundance with available moisture.

Salty Clay Hill, Hot Desert Shrub. This ecological site group includes soil map units; the Geefour part of GFF—Geefour-Corazones-Ojinaga association, 5 to 45 percent slopes; GEF—Geefour silty clays complex, 10 to 45 percent slopes (fig. 42); and the Geefour part of GMF—Geefour and Melado soils.

This site occurs on strongly sloping to steep erosional fan remnants. Soils are shallow, well drained and formed in clayey lacustrine deposits. A sparse community of drought tolerant shrubs and infrequent grasses characterizes this site.

The reference plant community consists of approximately 40 percent tobosa; 10 percent alkali sacaton; 15 percent false grama, whorled dropseed, and Hall's panicum; 2 percent fluffgrass; 3 percent other grasses; 16 percent western honey mesquite, tubercled saltbush, mound saltbush, creosotebush, and wolfberry; 6 percent other shrubs; and 8 percent forbs. Under continuous heavy grazing grasses such as alkali sacaton and Hall's panicum will initially decrease then all grasses will ultimately decrease. Tubercled and mound saltbushes probably increase slightly in some places.

Figure 42.—Purple pricklypear, saltbush occupy this area Geefour silty clays complex, 10 to 45 percent slopes. The gravel veneer in the foreground enhances infiltration of rainfall, and allows plants to grow in a very hot dry environment. Geefour soils are in the Salty Clay Hill ecological site, Hot Desert Shrub vegetative zone of MLRA 42—Southern Desertic Basins, Plains, and Mountains. The steeper slopes in the background have lost the gravel veneer to geological erosion. Most rainfall runs off, so plants are unable to grow there.

MLRA 42—Southern Desertic Basins, Plains, and Mountains

Desert Grassland Vegetative Zone

The Desert Grassland vegetative zone is mostly at elevations of 3,500 to 4,500 feet. The climate and soils support a sparse cover of grasses and shrubs.

The climax vegetation is mainly shortgrasses such as black grama, burrograss, tobosa, and midgrasses such as cane bluestem, sideoats grama, Arizona cottontop, and plains bristlegrass. Primary shrubs include butterflybush, fourwing saltbush, creosotebush, and tarbush. Woody species such as creosotebush, tarbush, acacias, and mesquite have encroached on many sites because of historic overgrazing by livestock.

Arroyo, Desert Grassland. This group includes soil map unit; the Bodecker part of ALB—Altar-Bodecker-Riverwash association, 0 to 7 percent slopes, flooded. (fig. 43); and the Bodecker part of TEA—Tenneco-Bodecker complex, 0 to 3 percent slopes, flooded.

This site occurs on nearly level to moderately sloping arroyos, drainageways, and stream terraces. Soils are very deep, well drained, and formed in loamy and gravelly alluvium. Occasional to frequent flash floods occur within this site causing instability of plant communities along and within incised channels. Species composition is diverse and varies with landform and depth to ground water.

Figure 43.—Sideoats grama, alkali sacaton, littleleaf walnut, western honey mesquite, littleleaf sumac, and catclaw acacia on Bodecker soils in an area of Altar-Bodecker-Riverwash association, 0 to 7 percent slopes, flooded. Bodecker soils are in the Arroyo ecological site, Desert Grassland vegetative zone.

The reference community consists of approximately 15 percent western honey mesquite; 10 percent desert willow; 10 percent littleleaf sumac and apache plume; 10 percent catclaw acacia and whitebrush; 5 percent creosotebush and baccharis; 5 percent other shrubs; 13 percent sideoats grama and cane bluestem; 10 percent alkali sacaton and giant sacaton; 10 percent plains bristlegrass and whiplash pappusgrass; 7 percent other perennial grasses; 5 percent forbs such as menodora, milkwort, and guara.

Continuous heavy grazing by cattle on this site will result in a decrease in black grama, sideoats grama, tanglehead, and cane bluestem while fluffgrass, threeawn, triden, and annual forbs will increase. Eventually all grasses will decrease with prolonged continuous heavy grazing. Loss of deep rooted perennial grasses will lead stream channel instability and soil erosion. Shrubs that typically increase are western honey mesquite, creosotebush, and acacias. Palatable shrubs and forbs such as range ratany, skeletonleaf goldeneye, menodora, guara, and milkwort will also decrease with continuous heavy grazing by all classes of livestock especially sheep and goats. Because the site receives run in surface water, recovery of palatable plants is possible with no grazing or prescribed grazing. However the rate or probability of recovery will depend on the extent to which the site was disturbed.

Chert Hill, Desert Grassland. This ecological site group includes soil map unit; the Catto part of CAG—Catto-Buckear-Rock outcrop complex, 20 to 60 percent slopes.

This site occurs on gently sloping to steep hills and ridges. Soils are very shallow to very shallow that formed in material weathered from chert. The climax vegetation is dominated by short and midgrasses with occasional perennial forbs and woody shrubs. The exposed rock and stony nature of the soil contribute to good plant-soil-air-moisture relationship.

The historical climax plant community consists of 10 percent sideoats grama; 10 percent black grama; 16 percent tanglehead and green sprangletop, 16 percent Arizona cottontop and cane bluestem; 5 percent plains bristlegrass; 8 percent triden and sand

dropseed; 10 other perennial grasses; 10 percent perennial forbs such as menodora, hairy tubetongue, bundleflower, bushsunflower, daleas, and wild buckwheat; 10 percent skeletonleaf goldeneye, feather or black dalea, bernardia, and range ratany; and 5 percent whitethorn acacia, catclaw mimosa, sotol, yucca, lechuguilla, and other various cacti.

As retrogression occurs, black grama and hairy grama increase and tend to dominate the plant community. With continued retrogression, vegetative cover decreases sharply and red grama, hairy triden, fluffgrass, and annuals become prevalent. Skeletonleaf goldeneye, feather or black dalea, bernardia, and range ratany are replaced by other woody plants such as catclaw, whitethorn, mesquite, whitebrush, mariola, and creosotebush. Lechuguilla, sotol, and cacti also become more prevalent in the deteriorated plant community.

Clay Loam, Desert Grassland. This ecological site group includes soil map units; MOA—Martillo and Butcherknife soils, 0 to 3 percent slopes; and VAA—Verhalen silty clay, 0 to 2 percent slopes, rarely flooded.

This site usually occurs on broad, nearly level flood plains of wide valleys, which receive occasional overflow. The site exhibits small 'micro-sites', consisting of a succession of micro-basins and micro-knolls, resulting from the high shrink-swell properties of the soils. The soils crack strongly upon drying. This can cause a high degree of root pruning among unadapted plants. The climax plant community is dominated by strong rooted grasses and annual forbs. Perennial forbs and woody species are scarce in the climax community.

The historical climax plant community consists of approximately 50 percent tobosa; 10 percent vine mesquite; 10 percent blue grama; 5 percent cane bluestem; 5 percent sideoats grama; 5 percent alkali sacaton; 5 percent sand muhly, plains bristlegrass, Arizona cottontop, and Hall’s panicum; 5 percent other grasses; 3 percent forbs; and 2 percent woody species such as butterflybush, fourwing saltbush, and wolfberry. As retrogression occurs, sideoats grama, blue grama, Arizona cottontop, plains bristlegrass, vine mesquite, and cane bluestem decrease. As the more palatable species decrease, tobosa will initially increase. Under continuous heavy grazing, sand muhly, burrograss, and perennial threeawn will increase after stands of tobosa begin to deteriorate. Annual grasses and forbs are a natural component of the climax plant community, but as the grass cover decreases, they increase strongly. Continued deterioration results in the site being dominated by mesquite, broom snakeweed, lotebush, and javelinabush.

Draw, Desert Grassland. This ecological site group includes soil map unit; NLA—Nillo silty clay, 0 to 2 percent slopes, occasionally flooded.

This site occurs on narrow, frequently overflowed natural drainage courses which receive runoff water from adjoining sites and remote higher elevations. This site has the appearance of a savannah with trees and shrubs being dominant in aspect. However, tall bunchgrasses, midgrasses, and rhizomatous and stoloniferous shortgrasses have the greatest annual production. There is also an abundant variety of forbs in the understory. The soils or this site are deep and have good plant-soil-air-moisture relationships. This, in conjunction with the extra water it receives, contributes to this site being highly productive. However, if left unprotected by plant cover, the soil tends to crust and become susceptible to severe gully erosion.

The historical climax plant community consists of approximately 25 percent alkali sacaton and giant sacaton; 20 percent cane bluestem and sideoats grama; 10 percent Arizona cottontop and plains bristlegrass; 5 percent blue grama; 5 percent black grama and bush muhly; 10 percent vine mesquite and tobosa; 5 percent other grasses; 5 percent perennial forbs such as globemallow, bushsunflower, hairy tubetongue, and Mexican sagewort; 10 percent fourwing saltbush and butterflybush; and 5 percent other shrubs such as wolfberry, littleleaf sumac, desert willow, western honey mesquite, and ephedra.

Under continuous heavy grazing, the midgrasses such as sideoats grama and cane bluestem decrease while the shortgrasses such as blue grama, tobosa, and burrograss initially increase and eventually replace the midgrasses. Other shortgrasses and forbs such as Texas groundsel, ragweed, sneezeweed, broom snakeweed, and paperflower increase or invade the site. With continued site deterioration, woody plants such as tarbush, whitebrush, mesquite, lotebush, creosotebush, and cacti increase.

Gravelly, Desert Grassland. This ecological site group includes soil map unit; the Altar part of ALB—Altar-Bodecker-Riverwash association, 0 to 7 percent slopes, flooded; the Borunda, gravelly part of BOC—Borunda soils, 1 to 8 percent slopes (fig. 44); CIC—Chilicotal very gravelly fine sandy loam, 1 to 8 percent slopes; CID—Chilicotal very gravelly sandy loam, 5 to 16 percent slopes; CLC—Chilicotal and Paisano soils, 1 to 8 percent slopes; the Gemelo part of GSA—Gemelo-Straddlebug complex, 1 to 3 percent slopes; MAE—Manzanillo and Paisano soils, 1 to 30 percent slopes; the Manzanillo and Chilicotal parts of MBE—Manzanillo, Chilicotal, and Holguin soils, 1 to 30 percent slopes; NPB—Nolam and Paisano soils, 1 to 3 percent slopes; PAC—Paisano very gravelly fine sandy loam, 1 to 8 percent slopes; PAD—Paisano very gravelly fine sandy loam, 5 to 16 percent slopes; the Paisano part of PIB—Paisano-Musgrave association, 1 to 5 percent slopes; and the Nolam part of QBE—Quadria, Nolam, and Musgrave soils, 0 to 30 percent slopes; and the Boludo part of SDC—Sauceda and Boludo soils, 1 to 8 percent slopes.

Figure 44.—Borunda gravelly soils in an area of Borunda soils, 1 to 8 percent slopes. Vegetation consists of creosotebush, western honey mesquite, tobosa, burrograss, and fluffgrass. The Borunda gravelly soils are in the Gravelly ecological site, Desert Grassland vegetative zone. San Jacinto Peak can be seen in the background.

The site occurs on nearly level to moderately sloping inset fans and eroded remnants of piedmont slopes. Soils are very shallow to very deep soils that formed in gravelly alluvium derived mostly from igneous materials. The historic climax plant community consists of predominantly drought tolerant mid and short grasses with scattered woody shrubs and occasional forbs. Vegetative cover of this site will deteriorate very quickly if mismanaged and range recovery is extremely slow.

The historical climax plant community consists of approximately 30 percent black grama and bush muhly; 15 percent Arizona cottontop, triden, and sideoats grama; 10 percent sand dropseed and perennial threeawn; 10 percent plains bristlegrass and cane bluestem, 2 percent fluffgrass; 8 percent other grasses; 10 percent creosotebush and mariola; 5 percent fourwing saltbush and skeletonleaf goldeneye, 3 percent range ratany; 2 percent other shrubs; and 5 percent forbs. Under continuous heavy grazing, the plant community deteriorates to a more sparsely vegetated community with an increasing amount of bare ground. Plants such as black grama, bush muhly, sideoats grama, Arizona cottontop, cane bluestem, plains bristlegrass, and fourwing saltbush will decrease. Other plants such as threeawn, fluffgrass, burrograss, catclaw mimosa, tarbush, cacti, and yucca will increase. Creosotebush increases and often becomes the dominant species. Some mesquite also increases where the soil is deeper.

Igneous Hill and Mountain, Desert Grassland. This ecological site group includes soil map units; the Horsetrap and Bofecillos parts of BNE—Bofecillos-Horsetrap-Rock outcrop complex, 10 to 30 percent slopes; the Bofecillos part of BNG—Bofecillos-Rock outcrop complex, 12 to 60 percent slopes; HOB—Holguin very gravelly fine sandy loam, 1 to 8 percent slopes; the Horsetrap and Bofecillos parts of HOD—Horsetrap-Bofecillos complex-Rock outcrop complex, 1 to 12 percent slopes; LGC—Lingua very gravelly loam, 1 to 8 percent slopes; the Lingua part of LIF—Lingua-Ohtwo complex, 20 to 45 percent slopes; the Holguin part of MBE—Manzanillo, Chilicotal, and Holguin soils, 1 to 30 percent slopes; PKD—Pantak and Lingua soils, and Rock outcrop, 10 to 30 percent slopes; PKE—Pantak and Lingua soils, 1 to 16 percent slopes; REE—Reduff, Scotal, and Holguin soils, 1 to 30 percent slopes; SDC—Sauceda and Boludo soils, 1 to 8 percent slopes; the Sauceda part of SEE—Sauceda-Decoty complex, 1 to 20 percent slopes; SHC—Scotal and Holguin soils, 1 to 8 percent slopes; the Scotal part of SHE—Scotal-Rock outcrop complex, 5 to 30 percent slopes; and the Scotal and Ohtwo parts of SIG—Scotal-Ohtwo-Rock outcrop complex, 20 to 70 percent slopes. (fig. 45).

This site occurs on strongly sloping to very steep hills and mountains. Soils are shallow to very shallow and formed in residuum and colluvium weathered from igneous bedrock. The climax plant community consists of short and mid grasses, numerous shrubs, and frequent perennial forbs.

The historical climax plant community consists of 20 percent black grama; 15 percent sideoats grama; 10 percent cane bluestem and tanglehead; 10 percent green sprangletop; 10 percent Arizona cottontop, bush muhly, plains bristlegrass, and plains lovegrass; 5 percent tobosa; 5 percent blue grama and hairy grama; 5 percent perennial threeawn, fall witchgrass, triden, and sand dropseed; 10 percent perennial forbs such as sticky selloa, mentzelia, bushsunflower, menodora, wildbuckwheat, verbena, and hairy tubetongue; 3 percent skeletonleaf goldeneye; 5 percent narrowleaf foresteria, range ratany, black dalea, feather dalea, bush croton, mariola, and skunkbush; and 2 percent pricklypear, cholla, lechuguilla, sacahuista, yucca, and sotol. Under continuous heavy grazing, sideoats grama, black grama, blue grama, cane bluestem, tanglehead, and green sprangletop decrease. Other plants such as tobosa, hairy grama, fall witchgrass, and triden will increase. Continued retrogression results in an increase in fluffgrass, perennial threeawn, lechuguilla, broom snakeweed, and annuals. Woody species such as catclaw and whitebrush increase and often become the dominant species on some slopes.

Limestone Hill and Mountain, Desert Grassland. This ecological site group includes soil map unit; the Bissett parts of BIC—Bissett-Rock outcrop complex, 1 to 8

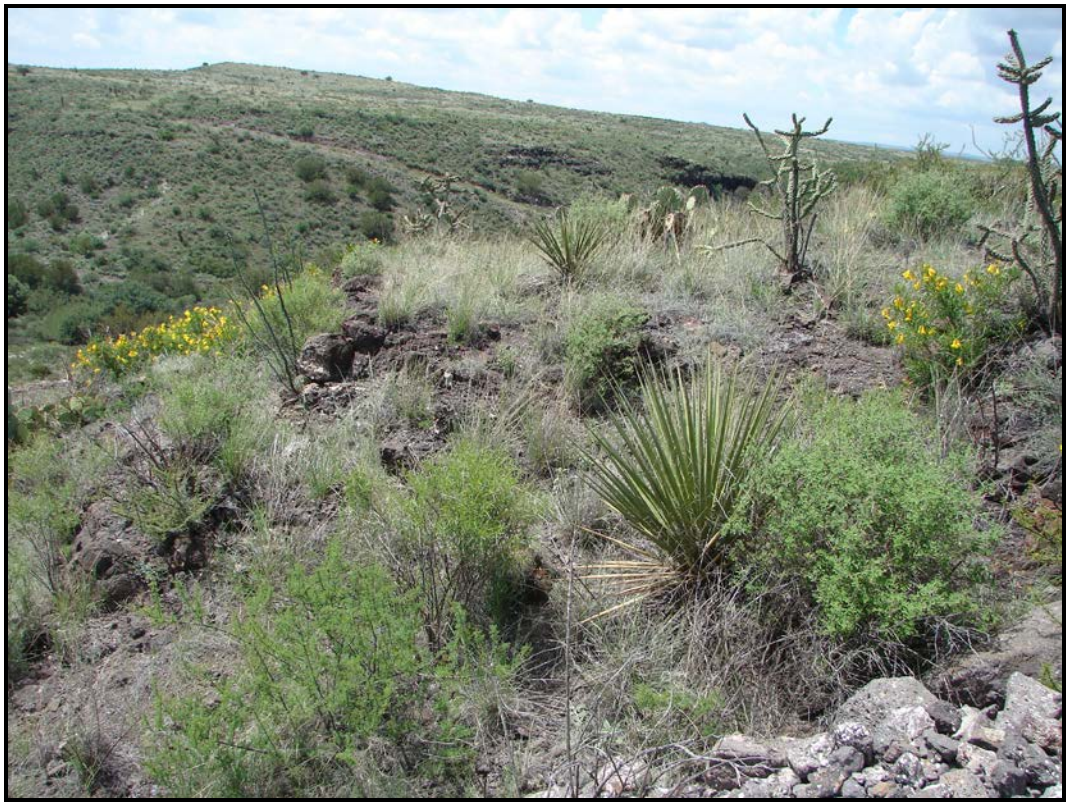

Figure 45.—Black grama, sideoats grama, triden, skeletonleaf goldeneye, catclaw acacia, ocotillo, cholla, and yucca on an area of Scotal-Ohtwo-Rock outcrop complex, 20 to 70 percent slopes. This map unit is in the Igneous Hill and Mountain ecological site, Desert Grassland vegetative zone.

percent slopes; BIE—Bissett-Rock outcrop complex, 5 to 30 percent slopes (fig. 46); and BIG—Bissett-Rock outcrop complex, 20 to 70 percent slopes.

This site occurs on gently sloping to very steep hills and mountains. Soils are very shallow to very shallow and formed in loamy residuum over limestone bedrock. The climax plant community consists of short and midgrasses intermixed with shrubs and forbs.

The historical climax plant community consists of approximately 30 percent black grama and sideoats grama; 20 percent Arizona cottontop, tanglehead, and feather pappusgrass;15 percent triden, fall witchgrass, fluffgrass, and perennial threeawn; 10 percent other grasses; 5 percent perennial forbs such as menodora, bushsunflower, daleas, sundrops, grassland croton, greenthread, wild buckwheat, and hairy tubetongue; 5 percent skeletonleaf goldeneye; 5 percent feather or black dalea, range ratany, desert myrtle croton; 5 percent acacias, sotol, pricklypear, lechuguilla, and tasajillo; 5 percent other shrubs. Under continuous heavy grazing black grama, sideoats grama, and Arizona cottontop will decrease. Other plants such as threeawn, fluffgrass, triden, acacia, lechuguilla, and other woody species will increase.

Loamy, Desert Grassland. This ecological site group includes soil map unit; the Borunda part of BOC—Borunda soils, 1 to 8 percent slopes; the Straddlebug part of GSA—Gemelo-Straddlebug complex, 1 to 3 percent slopes; the Quadria part of QBE—Quadria, Nolam, and Musgrave soils, 0 to 30 percent slopes; SRA—Straddlebug silty clay loam, 0 to 3 percent slopes; and the Tenneco part of TEA—Tenneco-Bodecker complex, 0 to 3 percent slopes, flooded.

Figure 46.—An area of Bissett-Rock outcrop complex, 5 to 30 percent slopes. Vegetation consists of mariola, whitethorn acacia, cholla, fluffgrass, and triden. Bissett soils are in the Limestone Hill and Mountain ecological site, Desert Grassland vegetative zone.

This site occurs on nearly level to gently sloping broad alluvial flats and flood plains. Soils are very deep and formed in loamy alluvium derived from igneous and sedimentary material. This ecological site is dominated by drought tolerant short and mid grasses with shrubs and half shrubs sparse and evenly distributed. Small, slightly depressed areas support larger amounts of mid grasses. There is an abundant variety of forbs.

The historical climax plant community consists of approximately 25 percent tobosa; 20 percent blue grama; 10 percent black grama; 10 percent sideoats grama and bush muhly; 10 percent plains bristlegrass, Arizona cottontop, and cane bluestem; 10 percent perennial threeawn and burrograss; 5 percent sand or mesa dropseed; 5 percent perennial forbs such as leatherweed croton, globemallow, and Mexican sagewort; and 5 percent fourwing saltbush and butterflybush. Retrogression under continuous heavy grazing results in a decrease of blue grama, black grama, sideoats grama, plains bristlegrass, Arizona cottontop, cane bluestem, and palatable forbs and shrubs such as Mexican sagewort, fourwing saltbush, and butterflybush. Other species including sand muhly, burrograss, tobosa, perennial threeawn, ear muhly, sand dropseed, and annuals increase under continuous heavy grazing. Tarbush, creosotebush, allthorn, and javelinabush will increase with site deterioration. Herbaceous species such as fluffgrass, sixweeks grama, annual threeawn, dogweed, and broom snakeweed also increase under severe deterioration.

Sandstone Hill and Mountain, Desert Grassland. This ecological site group includes soil map units; BUD—Buckear-Coyanosa complex, 5 to 16 percent slopes; and the Buckear part of CAG—Catto-Buckear-Rock outcrop complex, 20 to 60 percent slopes.

This site occurs on moderately sloping to steep hills and mountains. Soils are very shallow to very shallow and formed in loamy residuum over sandstone bedrock. The climax plant community is characterized by mid and short grasses with an abundance and variety of forbs and woody shrubs.

The historical climax plant community consists of approximately 20 percent black grama; 15 percent sideoats grama; 10 percent blue grama and Arizona cottontop; 5 percent cane bluestem; 5 percent tanglehead; 5 percent green sprangletop and plains bristlegrass; 5 percent chino grama; 5 percent vine mesquite and bush muhly; 5 percent hairy grama, mesa dropseed, and perennial threeawn; 5 percent sand dropseed, fall witchgrass, Hall's panicum, and rough triden; 5 percent perennial forbs such as menodora, crotons, blackfoot, angel trumpet, and sticky selloa; 5 percent range ratany, feather dalea, and skeletonleaf goldeneye; 5 percent littleleaf sumac, apache plume, ephedra, hackberry, and narrowleaf foresteria; 5 percent fourwing saltbush javelinabush, catclaw, agarito, sotol, lechuguilla, and whitebrush. Under continuous heavy grazing, sideoats grama, black grama, cane bluestem, Arizona cottontop, blue grama, and plains bristlegrass will decrease. Other plants such as perennial threeawn, hairy triden, burrograss, and fluffgrass will increase. Woody species such as catclaw, creosote, whitethorn acacia, and mesquite continue to increase as retrogression occurs.

Sandy Loam, Desert Grassland. This ecological site group includes soil map unit; KIB—Kinco gravelly sandy loam, 0 to 3 percent slopes. (fig. 47)

This site occurs on nearly level to gently sloping alluvial flats. Soils are deep to very deep and formed in coarse loamy alluvium derived from igneous and sedimentary rock. The climax plant community is characterized by mid and short grasses with an abundance and variety of forbs and woody shrubs.

Figure 47.—Spike dropseed, sand dropseed, plains bristlegrass, sand sagebrush, ephedra, and dayflower on an area of Kinco gravelly sandy loam, 0 to 3 percent slopes. This map unit is in the Sandy Loam ecological site, Desert Grassland vegetative zone.

The historical climax plant community consists of approximately 25 percent black grama; 10 percent sideoats grama; 20 percent sand dropseed, spike dropseed, and mesa dropseed; 10 percent bush muhly and Arizona cottontop; 5 percent plains bristlegrass; 7 percent other grasses; 10 percent fourwing saltbush, creosotebush, sand sagebrush, range ratany, and yucca, 3 percent other shrubs; 10 percent forbs. Under continuous heavy grazing, sideoats grama, black grama, Arizona cottontop, and plains bristlegrass and fourwing saltbush will decrease. Other plants such as perennial threeawn and triden will increase. Woody species such as catclaw, creosotebush, and whitethorn acacia continue to increase as retrogression occurs.

MLRA 42—Southern Desertic Basins, Plains, and Mountains

Mixed Prairie Vegetative Zone

The Mixed Prairie vegetative zone includes intermountain grasslands and valleys and rolling to steep hills and mountain slopes, generally between 4,500 and 6,000 feet elevation. The climate and soils support a climax vegetation of short and mid grasses as co-dominants, with only occasional low shrubs and trees.

The climax vegetation is mainly sideoats grama, cane bluestem, blue grama, and black grama. The woody vegetation such as butterflybush, oaks, daleas, junipers, and acacias occur primarily in draws and headers, and on rocky slopes of hills and mountains.

Basalt Hill, Mixed Prairie. This ecological site group includes soil map unit; CVC—Costvar and Volco soils, 1 to 8 percent slopes; and the Volco part of VOC—Volco and Pardo soils, 1 to 8 percent slopes.

This site occurs on moderately sloping hills and consists of very shallow to very shallow soils that formed over basalt. The climax vegetation is dominated by a mixture of both short and mid grasses. Numerous perennial forbs and occasional shrubs and trees occur in association with the perennial grasses.

The historical climax plant community consists of approximately 25 percent black grama; 20 percent sideoats grama and blue grama; 15 percent tanglehead, cane bluestem, and plains lovegrass; 10 percent wolftail and Arizona cottontop; 6 percent sacahuista, javelinabush, and feather dalea; 24 percent other shrubs, grasses, and forbs.

Under continuous heavy grazing, bluestem, sideoats grama, tanglehead, and other midgrasses are initially replaced in the plant community by threeawn, fall witchgrass, and other shortgrasses. With further deterioration of the plant community, plants such as juniper, catclaw, and pricklypear continue to increase.

Clay Flat, Mixed Prairie. This ecological site group includes soil map unit; MOA—Martillo and Butcherknife soils, 0 to 3 percent slopes; PTA—Phantom clay, 0 to 2 percent slopes, occasionally flooded; and the Phantom part of PZB—Phantom-Musquiz complex, 1 to 5 percent slopes.

This site occurs on broad, nearly level depressions on flood plains of wide valleys. Soils are deep and fine textured. The climax vegetation is dominated by strong rooted rhizomatous and stoloniferous grasses. Perennial forbs and woody species are scarce in the climax community.

The historical climax plant community consists of approximately 55 percent tobosa; 10 percent vine mesquite; 10 percent blue grama; 5 percent sideoats grama; 5 percent cane bluestem; 5 percent alkali sacaton and sand muhly; 5 percent Hall’s panicum, Arizona cottontop, plains bristlegrass, burrograss, buffalograss, and mat muhly; 5 percent perennial forbs such as bladderpod, rushpea, and croton; and a trace amount of woody species such as javelinabush, lotebush, butterflybush, and wolfberry. Under continuous heavy grazing, blue grama, vine mesquite, sideoats grama, and cane bluestem decrease. As these grasses decrease, tobosa increases. However, as retrogression continues to occur, tobosa will decrease and threeawn, sand muhly, and burrograss will increase.

Mesquite, javelinabush, tarbush, pricklypear, broom snakeweed, and lotebush invades as well as poisonous weeds such as locoweed, senecio, and garbancillo.

Draw, Mixed Prairie. This ecological site group includes soil map unit; the Rockhouse part of RMB—Rockhouse, flooded-Medley complex, 5 to 30 percent slopes (fig. 48).

This site generally occurs on narrow, frequently overflowed draws which receive runoff water from adjoining sites and remote, higher elevations. Soils are deep, gravelly, and coarse loamy. The climax vegetation is dominated by midgrasses with an intermittent overstory of shrubs and trees. Considerable variation occurs in vegetation because of periodic overflows. Annuals temporarily occupy recent alluvial deposits of silt and sand.

The historical climax plant community consists of approximately 20 percent sideoats grama; 15 percent cane bluestem; 10 percent giant sacaton; 5 percent vine mesquite; 5 percent green sprangletop and plains lovegrass; 5 percent plains bristlegrass and Arizona cottontop; 5 percent alkali sacaton; 5 percent tobosa and blue grama; 5 percent other grasses; 5 percent perennial forbs such as globemallow, croton, milkwort, and dayflower; 5 percent walnut, western soapberry, willow, and cottonwood; 5 percent oaks such as graves, emory, gray, and Texas; and 5 percent whitebrush, brickellbush, skunkbush, and apacheplume; 5 percent other shrubs and trees. Under continuous heavy grazing, sideoats grama, cane bluestem, vine mesquite, green sprangletop, and Arizona cottontop will decrease. Blue grama, tobosa, and alkali sacaton will initially increase before being replaced by perennial threeawn and various kinds of muhly. Other species which increase and invade include whitebrush, baccharis, catclaw, and mesquite. Annual species also become more prevalent as retrogression occurs.

Gravelly, Mixed Prairie. This ecological site group includes soil map unit; the Chilimol part of CMC—Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes; the Medley part of RMB—Rockhouse, flooded-Medley complex, 5 to 30 percent slopes; and SCB—Sanmoss-Medley complex, 1 to 5 percent slopes.

Figure 48.—Rockhouse soils in an area of Rockhouse, flooded-Medley complex, 5 to 30 percent slopes. Vegetation consists of sideoats grama, blue grama, cane bluestem, and western honey mesquite. Rockhouse soils are in the Draw ecological site, Mixed Prairie vegetative zone.

This site occurs on nearly level to sloping fans and terraces usually extending from the base of igneous hills and mountains. Soils are deep, gravelly, and loamy. The climax vegetation is dominated by short and midgrasses. Midgrasses are more prominent in small areas of extra water concentration.

The historical climax plant community consists of approximately 15 percent sideoats grama; 15 percent black grama; 10 percent cane bluestem; 10 percent blue grama; 5 percent green sprangletop; 5 percent plains bristlegrass; 5 percent plains lovegrass; 5 percent perennial threeawn; 5 percent tobosa; 5 percent hairy grama and slim triden; 5 percent sand dropseed and sand muhly; 5 percent hairy triden and burrograss; 5 percent perennial forbs such as menodora, hairy tubetongue, globemallow, milkwort, bladderpod, and croton; and 5 percent woody species, including graves and gray oak, butterflybush, and winterfat.

Under continuous heavy grazing, the midgrasses such as sideoats grama, cane bluestem, green sprangletop, and plains bristlegrass decrease while species such as blue grama, black grama, perennial threeawn, and triden increase. As retrogression continues, blue grama and black grama decrease while sand dropseed, sand muhly, hairy grama, and burrograss increase along with an invasion of lower yielding perennial and annual species of grasses and forbs. Javelinabush, mesquite, and whitethorn acacia increase or invade strongly with severe deterioration of the climax plant community.

Igneous Hill and Mountain, Mixed Prairie. This ecological site group includes soil map unit; BRD—Brewster very gravelly loam, 1 to 12 percent slopes (fig. 49); the Brewster parts of BRF—Brewster-Rock outcrop complex, 10 to 30 percent slopes; and BRG—Brewster-Rock outcrop complex, 20 to 70 percent slopes.

Figure 49.—Blue grama, wolftail, cane bluestem, sideoats grama, sacahuista, cholla, and gray oak on an area of Brewster very gravelly loam, 1 to 12 percent slopes. Brewster soils are in the Igneous Hill and Mountain ecological site, Mixed Prairie vegetative zone.

This site occurs on hills and mountains and ridges. Soils are very shallow to very shallow that formed materials weathered from igneous bedrock. The climax vegetation is dominated by a mixture of both short and mid grasses. Numerous perennial forbs and occasional shrubs and trees occur in association with the perennial grasses. Shrubs and trees are most prevalent in areas with abundant igneous rock outcrops.

The characteristic vegetation consists of approximately 15 percent sideoats grama; 15 percent black grama; 10 percent cane bluestem; 10 percent Texas bluestem and little bluestem; 10 percent tanglehead and blue grama; 5 percent plains lovegrass; 10 percent other perennial grasses; 4 percent feather dalea and range ratany; 10 percent other shrubs; 3 percent gray oak and rose fruited juniper; 3 percent other trees; and 5 percent forbs. Under continuous heavy grazing, bluestem, sideoats grama, tanglehead, and other mid grasses are initially replaced in the plant community by threeawn, fall witchgrass, and other short grasses. With further deterioration of the plant community, plants such as juniper, catclaw, and pricklypear continue to increase.

Loamy Slope, Mixed Prairie. This ecological site group includes soil map unit; the Berrend part of BEB—Berrend and Espy soils, 1 to 5 percent slopes; the Berrend part of CMC—Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes (fig. 50); the Berrend part of CND—Chinati, Boracho and Berrend soils, 1 to 15 percent slopes; the Eppenauer part of EEB—Espy-Eppenauer complex, 1 to 5 percent slopes; the Murray part of MUB—Murray-Marfa-Boracho association, 1 to 5 percent slopes;

This site occurs on gently undulating fan remnants and fan piedmonts. Soils are deep and formed in loamy alluvium derived from igneous and sedimentary rocks. The climax vegetation is dominated by short and mid grasses with scattered shrubs.

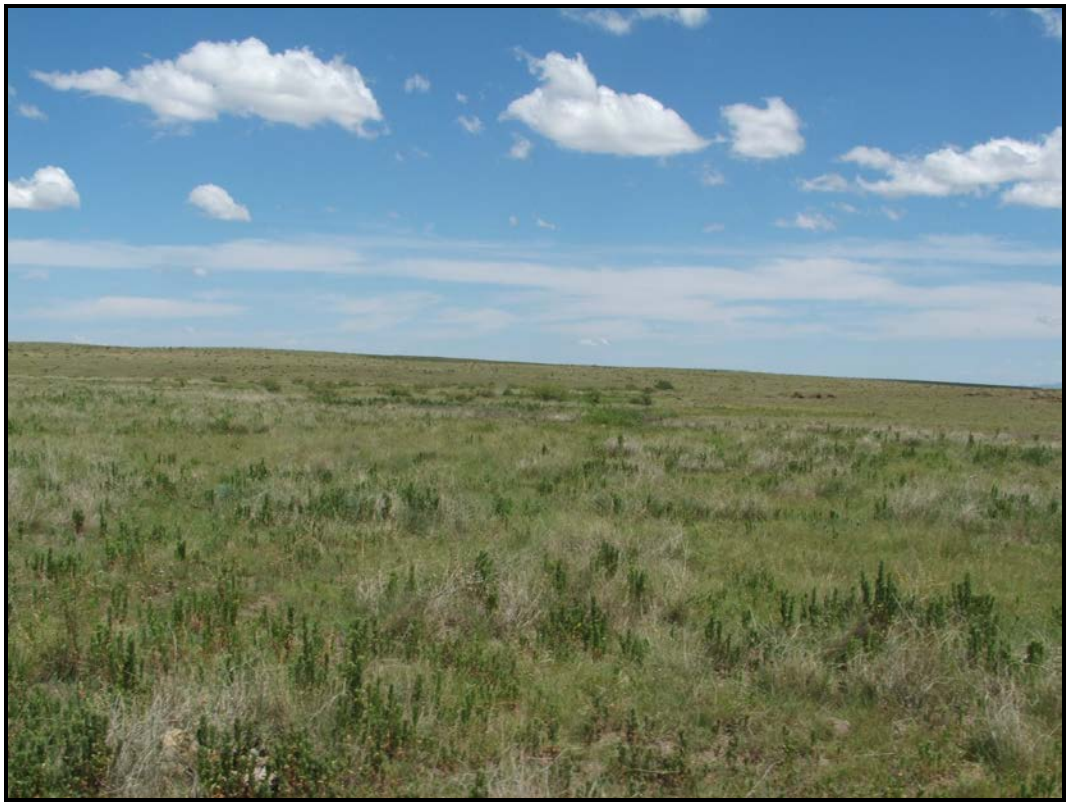

Figure 50.—Rangeland area of Berrend soils in an area of Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes. Berrend soils are in the Loamy Slope ecological site, Mixed Prairie vegetative zone.

The historical climax plant community consists of approximately 25 percent black grama; 25 percent blue grama; 10 percent sideoats grama; 10 percent cane bluestem and plains bristlegrass; 5 percent sand muhly and sand dropseed; 10 percent shrubs such as ephedra, soaptree yucca, butterflybush, and others; 15 percent other grasses and forbs. Under continuous heavy grazing plants such as black grama, blue grama, plains bristlegrass will decrease while threeawn, sand muhly, and shrubs will increase. Amount of bare ground will also increase with deterioration of the plant community.

Loamy Swale, Mixed Prairie. This ecological site group includes soil map unit; and the Marfa part of MUB—Murray-Marfa-Boracho association, 1 to 5 percent slopes; and MZA—Musquiz clay loam, 0 to 3 percent slopes. MZA—Musquiz clay loam, 0 to 3 percent slopes (fig. 51); MCA—Marfa clay loam, 0 to 2 percent slopes; and the Musquiz part of PZB—Phantom-Musquiz complex, 1 to 5 percent slopes.

The site occurs as swales on valley floors and stream terraces. Soils are very deep and formed in loamy and clayey alluvium derived from igneous and sedimentary rocks. The climax vegetation is dominated by short and mid grasses with very few isolated shrubs.

The historical climax plant community consists of approximately 35 percent blue grama; 25 percent sideoats grama and cane bluestem; 15 percent vine mesquite and Swallen's curly mesquite; 10 percent tobosa and plains bristlegrass; 5 percent buffalograss and sand muhly; 10 percent other grasses, forbs, and shrubs. Under continuous heavy grazing plants such as blue grama, bristlegrass, buffalograss, and bundleflower will decrease. Tobosa, threeawn, and sand muhly will be among the plants that will increase.

Figure 51.—An area of Musquiz clay loam, 0 to 3 percent slopes. Musquiz soils are in the Loamy Swale ecological site, Mixed Prairie vegetative zone.

Shallow, Mixed Prairie. This ecological site group includes soil map unit; the Espy part of BEB—Berrend and Espy soils, 1 to 5 percent slopes; BOB—Boracho-Espy complex, 1 to 8 percent slopes; the Boracho part of CMC—Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes; the Chinati and Boracho parts of CND—Chinati, Boracho and Berrend soils, 1 to 15 percent slopes; CNE—Chinati-Boracho complex, 5 to 20 percent slopes (fig. 52); the Espy part of EEB—Espy-Eppenauer complex, 1 to 5 percent slopes; the Boracho part of MUB—Murray-Marfa-Boracho association, 1 to 5 percent slopes; and the Pardo part of VOC—Volco and Pardo soils, 1 to 8 percent slopes.

This site occurs on fans, ridges, and terraces in broad intermountain valleys at the base of igneous hills and mountains. Soils are shallow to a petrocalcic horizon. The climax vegetation is predominantly short grasses with mid grasses occurring infrequently. Occasional forbs and woody shrubs occur in association with the grasses.

The historical climax plant community consists of approximately 25 percent black grama; 25 percent blue grama; 10 percent sideoats grama; 10 percent cane bluestem; 5 percent tobosa; 5 percent green sprangletop; 5 percent plains bristlegrass; 5 percent perennial threeawn; 3 percent plains lovegrass and hairy grama; 5 percent perennial forbs such as menodora, bushsunflower, globemallow, perennial bladderpod, and croton; and 2 percent woody species such as graves oak, gray oak, feather and black dalea, javelinabush, winterfat, and ephedra. Under continuous heavy grazing, species such as black grama, blue grama, sideoats grama, and cane bluestem decrease. A corresponding increase of species such as hairy grama, perennial threeawn, and annuals occur. Catclaw, whitethorn acacia, and javelinabush are primary increasers with further deterioration of the climax plant community.

Figure 52.—Cattle grazing on an area of Chinati-Boracho complex, 5 to 20 percent slopes. This map unit is in the Shallow ecological site, Mixed Prairie vegetative zone.

Recreation

Presidio County offers many recreational opportunities. Big Bend Ranch State Park located in the southeast part of county offers hiking, primitive camping, park lodging, off-road trails for vehicles and horses, and water activities along the Rio Grande River. An estimated 300 species of birds are located throughout the park. Big Bend National Park in neighboring Brewster County offers similar activities. The diverse population of upland animals and game birds make wildlife a valuable part of the natural resources and recreation in Presidio County.

Several historic markers are located throughout the County. The city of Marfa entertains the populace with art and historical museums. Located east of Marfa, is the Marfa Lights viewing area.

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 verbal 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 1.0. 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 (fig. 53) 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,

Wildlife

Steve Nelle, biologist, Natural Resources Conservation Service prepared this section

Wildlife is one of the more important natural resources in Presidio County. The variety of soils, topography, climate, and vegetation supports an amazing diversity of wildlife. Historically, the kinds and numbers of wildlife have changed somewhat since the settlement by European man. Prior to early settlements, the grasslands and mountains of Presidio County supported large herds of pronghorn antelope, as well as bighorn sheep, mule deer, white-tailed deer, gray wolf, black bear, and mountain lion plus hundreds of species of smaller animals.

The conservation and management of wildlife and wildlife habitat are important considerations to most Presidio County landowners. The basic habitat needs of any wildlife population are food, cover, water, and space in the right combination and

Figure 53.—Pronghorn antelope on the fairways of the Marfa Golf Course. This course claims to be the highest elevation golf course in Texas.

arrangement. Each species of animal has its own unique requirements for these habitat elements. In order for wildlife to inhabit an area, the land must either naturally provide the habitat needs, or it must be managed by man so that specific habitat needs are met.

Soils have a great influence on the kinds and amounts of plants that are available for wildlife food and cover. The soils in the survey area are grouped into ecological sites according to the kinds, amounts, and proportions of plants which will grow. Different ecological sites vary in their ability to meet habitat needs, but each can be managed to benefit wildlife. Soils and geology influence the distribution of surface water used by wildlife. The past and present management of the land also influences wildlife habitat. Therefore, a good understanding of soils, ecological sites, and their response to management is important to proper wildlife habitat management. For detailed information on ecological sites, refer to the “Rangeland” section of this soil survey.

Over 60 native species of mammals occur in Presidio County. Of these, many kinds of rodents can be found including various species of ground squirrel, prairie dogs, pocket gophers, pocket mouse, kangaroo rat, mouse, cotton rat, wood rat, badger, and porcupine. The burrowing activities of most rodents are considered beneficial. Most rodents eat seeds and foliage, while some consume insects. Some of the seeds eaten include noxious or invading species. If rodent numbers climb to high levels, they can have a detrimental effect on range vegetation; however an abundance of natural predators normally prevents this from happening. Other small mammals include 15 species of bats, opossum, mole, and desert shrew.

Three kinds of rabbits occur in the area. The Davis Mountain cottontail occurs in the higher elevations of the Chinati Mountains where it is associated with oak, pinyon, and juniper woodland. The Audubon’s cottontail lives at lower elevations. The jackrabbit (fig. 54) is very common and can be detrimental to the vegetative resource when their numbers become excessive. Predators, however, play an important role in helping to keep their numbers in balance.

Figure 54.—A jackrabbit hiding amongst the brush. Jackrabbits are very common throughout the County.

Several species of predatory mammals exist including raccoon, ringtail, several kinds of skunk, badger, fox, coyote, bobcat, mountain lion, and a small number of black bear. The beneficial role of predators has been described, but when predator numbers become excessive, they can have a very serious impact upon wildlife and livestock. Trapping and hunting of coyotes, bobcat, and mountain lion is practiced where problems exist, in an effort to reduce losses to predation.

Native big game mammals include mule deer, white-tailed deer, pronghorn antelope, and javelina. Regulated hunting is practiced on these species, and income derived from leasing of hunting rights is a source of income for many ranches. Management for these species is commonly practiced in order to maintain or increase their numbers. In addition to the native species, elk, aoudad sheep, and feral hogs have been introduced into Presidio County and are hunted.

Mule deer (fig. 55) are the most abundant big game animal in the county with highest densities occurring in the mountains and canyons. Densities here range from 25 to 75 acres per deer. Lower densities of 100 to 250 acres per deer occur over much of the desert grassland areas. Very low populations occur across most of the Gravelly ecological sites in the desert shrub zone, and in areas with poor water distribution. White-tailed deer occur with mule deer in the higher elevations of the Chinati and Sierra Vieja Mountains, however their numbers are low.

Deer feed primarily on broadleaf forbs, browse, and mast. Grass makes up a very small part of the diet. Some of the more important forbs include spurge, bladderpod, croton, menodora, globe mallow, sida, sticky selloa, milkwort, greenthread, broom snakeweed, tallow weed, filaree, hairy tubetongue, fleabane, wild buckwheat, wild mercury, and snoutbean. The more important browse plants include whitethorn acacia,

Figure 55.—Mule deer on an area of Brewster very gravelly loam, 1 to 12 percent slopes. Providing water for livestock and wildlife is critical for their survival.

catclaw acacia, Roemer's acacia, daleas, skeletonleaf goldeneye, guayacan, desert olive, apache plume, fourwing saltbush, hackberry, kidneywood, skunkbush sumac, evergreen sumac, littleleaf sumac, mountain mahogany, oaks, juniper, granjeno, butterflybush, pricklypear, candelillia, and lechuguilla.

Mule deer prefer areas of moderate to thick brush which provide protective cover and shade as well as browse. Thick areas of grass among the brush are preferred fawning cover. Periodic die-offs and poor reproduction because of drought and poor nutrition keep mule deer numbers at or below carrying capacity in most areas. Excessive predation, especially by mountain lions, keeps populations suppressed in some areas.

A healthy population of pronghorn antelope occurs primarily on grassland flats. Historically, pronghorn antelope occurred in large numbers across most of Presidio County except in the higher mountain regions. Unregulated hunting and overgrazing by sheep and cattle between 1880 and 1920 nearly eradicated the pronghorn from the survey area. However with a shift from sheep to cattle grazing and enforcement of game laws, pronghorn began to recover by 1940. Restocking efforts hastened recovery until populations are now large enough to allow hunting.

Pronghorn (fig. 56) do not require brush for escape cover, but rely on keen eyesight and speed to detect and flee from danger. Their preferred diet consists primarily of forbs, but they also eat browse and cactus especially during stress periods. Like deer, they do not eat much grass, but require grass cover to hide fawns from predators. Pronghorn instinctively move long distances in their yearly travels in search of the best food sources and fawning grounds. These movements are restricted by conventional net wire fences, since pronghorn do not tend to jump fences. Net wire fences can be modified or replaced by barb wire fencing to allow pronghorn movement to other pastures. Pronghorn populations fluctuate considerably over time. Population declines are due primarily to prolonged drought, loss of fawning cover, poor nutrition, and predation.

Figure 56.—Pronghorn antelope on an area of Chinati-Boracho-Berrend association, 1 to 15 percent slopes. Pronghorn antelope are prominent in the Mixed Prairie vegetative zone.

Heavy and continuous yearlong grazing by livestock, especially sheep and goats, is detrimental to the habitat of deer and pronghorn. Under these conditions, excessive competition for the preferred food plants exist, limiting the food supply and leading to habitat deterioration. Grazing management which favors deer and pronghorn includes light to moderate stocking rates of cattle, de-stocking during dry periods and grazing rotations which provide periodic pasture deferment.

The absence of permanent water can also seriously limit deer and pronghorn populations. In areas where traditional livestock water developments are not feasible, water can be provided with rainfall catchment devices commonly known as guzzlers. A number of these guzzlers are present in the survey area.

Elk have been stocked by some landowners in the mountains in small numbers and those populations may spread to other areas. There is no evidence that elk were ever native in Presidio County although the now extinct Merriam's elk once occurred in the adjacent mountains of northern Mexico.

Javelina are present across much of Presidio County, being most abundant in areas of thick brush. Javelinas eat primarily the pads and fruit of pricklypear, and the flower stalks, leaves and roots of lechuguilla, sotol, and yucca. At higher elevations, they eat acorns and juniper berries. They also eat some grasses, forbs, and browse as well as insects, rodents, and carrion.

The desert bighorn sheep once occurred in the mountains of Presidio County. Unregulated market hunting severely hurt bighorn populations in the late 1800's. Overgrazing by domestic sheep damaged the habitat and spread bluetongue disease into the bighorn population. The original native bighorn sheep is now extinct in Texas. Re-stocking efforts have now successfully established thriving populations in Culberson and

Brewster Counties. There are some desert bighorn in Presidio County and their numbers appear to be increasing.

The aoudad sheep, introduced from northern Africa has established large and increasing populations in parts of Presidio County. These wild, free-ranging herds prefer rough, steep terrain and their numbers are difficult to control. As their numbers increase, they compete with mule deer for preferred forbs and browse and contribute to habitat deterioration.

Feral hogs are present in Presidio County, mainly in riparian and creek areas, as well as in the mountain areas. Feral hogs can be very destructive to the land and are also a predator of deer, antelope, quail, and other wildlife and livestock. Their numbers can increase rapidly.

The bird life of Presidio County is also quite diverse. Over 250 species are thought to occur in the county, with nearly 100 of these nesting in the survey area. Each of the bird species has its own unique habitat requirements. Some prefer the oak-juniper woodlands found at higher elevations, while others find their needs met in the sparsely vegetated desert shrublands.

Birds associated with water are found primarily along the Rio Grande River, several perennial creeks, and the numerous springs found scattered throughout the area. These birds include several kinds of ducks, grebes, coots, herons, egrets, sandpipers, and the belted kingfisher.

Raptorial birds of prey are common and include red-tailed hawk, Swainson's hawk, Harris hawk, kestrel, peregrine falcon, prairie falcon, and several kinds of owls. Golden eagles are present yearlong with peak numbers between October and March. Eagles are known to predate upon sheep, pronghorn, and deer, and especially lambs and fawns, however their main foods include rabbits and prairie dogs. Turkey vultures and black vultures are the primary carrion eaters. Ravens will eat small mammals, carrion, insects, and reptiles.

A large group of birds are almost exclusively insect eaters. The more common ones include nighthawks, poorwills, gnatcatchers, flycatchers, swallows, wrens, warblers, and vireos. The loggerhead shrike and roadrunner not only eat insects but also small reptiles and mice. Another large group of birds which eat seeds, fruits, or insects included verdin, thrush, mockingbird, thrashers, waxwing, tanager, cardinal, pyrrhuloxia, grosbeak, bunting, towhee, sparrows, blackbirds, cowbirds, meadowlarks, orioles and finches.

Six species of upland game birds can be found, five of which can be legally hunted. Both the mourning dove and white-winged dove occur. Small and scattered populations of turkey can be found. The turkey populations are increasing, and their range is expanding. The three kinds of quail are the scaled quail, Gambel's quail and Mearn's quail. The Mearn's quail are limited to the mountain areas where they inhabit oak-juniper-pinyon woodlands. There is no open season on Mearn's quail. Gambel's quail are found primarily in the draws and along the Rio Grande River. Scaled quail are the most numerous and are a popular game bird across much of the county.

Scaled quail spend their entire life in a rather small area and therefore must have all their habitat needs closely arranged. Quail numbers range from very abundant to very few from year to year based on rainfall and nesting success. Nesting cover consists of large clumps of grass, or under sacahuiste or yucca. Quail feed primarily on the hard seeds of forbs, grasses, and woody plants as well as insects and succulent greens when available. Some of the better scaled quail food plants in the survey area include cowpen daisy, pigweed, croton, spurge, broom snakeweed, Russian thistle, menodora, buffalobur, Hall's panicum, plains bristlegrass, mesquite, whitethorn acacia, tasajillo, wolfberry and desert willow. Quail can derive water from insects, greens, and fruits. However during extended dry periods when these moist foods are not available, quail will readily drink from surface water, and the populations do better when water is available.

Amphibians, including several kinds of frogs and toads and the tiger salamander are restricted to wet or seasonally wet areas such as creeks, seeps, cienegas, springs, ponds, livestock developments, and moist canyons.

A large number of reptiles inhabit the survey area. Several kinds of turtles are associated with permanent water. The desert box turtle spends its life on land. Two species of geckos are found. Over twenty species of lizards occur including the earls, collared, horned (fig. 57), spiny, and side blotched lizards, several species of whiptail lizards and two species of skink.

Over thirty species of snakes are found, most of them harmless to man and an important part of the natural balance. Some of the non-venomous snakes include several kinds of rat snake, hognose snake, king snake, milk snake, coach whip, bull snake, water snake, patchnose snake, blackhead snake, ringneck snake and garter snake. Venomous snakes include the Trans Pecos copperhead, and the following five species of rattlesnakes; western diamondback, Mojave, mottled rock, blacktail and prairie.

The water resources of Presidio County that are inhabited by fish are mostly limited to the Rio Grande River. Native game fish include largemouth bass, flathead catfish, channel catfish, and blue catfish. Other fish include freshwater drum, buffalo, gar and carp. Primary forage fishes include gizzard shad, bluegill, green and longear sunfishes along with a host of smaller fish including shiners, minnows, redhorse, chub and gambusia. A few permanent ponds occur and are stocked with bass, catfish and forage species. Alamito Creek and Cibolo Creek and a few other perennial creeks provide yearlong water and associated aquatic habitat for fish and amphibians.

Wildlife is a valuable part of the natural resources in the survey area. Wildlife has aesthetic value, enriching the lives of people who enjoy seeing them. They have ecological value, with each species playing a role in the complex balance of nature. Some species may have scientific value that is not yet recognized. Some kinds of wildlife also have a legitimate economic value which encourages proper habitat management. The conservation of wildlife as well as the soil, water, and plant resources is an important part of man's stewardship of the land.

Figure 57.—A Texas horny toad on Berrend soils in an area of Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes. Horny toads are examples of reptiles in Presidio County.

Wildlife Habitat

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

Table 18, Table 19, and Table 20 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; desertic herbaceous plants; habitat for burrowing mammals and reptiles; upland wild herbaceous plants; upland desertic shrubs and trees; upland shrubs and vines; upland deciduous trees; upland coniferous trees; upland mixed deciduous-coniferous 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 1.0. 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 *desertic herbaceous plants* indicate the limitation of the soils as a growing medium for a diverse desertic herbaceous plant community composed of plants adapted to an arid or semiarid environment. The soil properties and features that affect the growth of these plants are soil texture, available water capacity, the presence of excess salts in the soil, soil reaction (pH), soil moisture and temperature regimes, depth to a high water table, and the amount of rock fragments on the soil surface. Examples of upland desertic shrubs and trees are creosote bush, lechuguilla, ocotillo, whitethorn acacia, western honey mesquite

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, lizards, rattlesnakes, and armadillos.

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 wild herbaceous plants are bluestem, trichloris, bristlegrass, sideoats grama, western ragweed, bundleflower, and croton.

Ratings for *upland desertic shrubs, trees, 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 used by birds for forage and habitat are catclaw acacia, catclaw mimosa, green condalia, lotebush, algerita, elbowbush, wolfberry sumac, and hackberry. Examples of upland trees include live oak, shin oak, hackberry, bumelia, Roemer acacia, elbowbush, skunkbush sumac, littleleaf sumac, ephedra, fourwing saltbush, and juniper are used by deer for forage and habitat.

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 switchgrass, giant sacaton, spikerush, knotgrass, and inland saltgrass.

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 buttonbush, blackwillow, little walnut, baccharis, and sycamore.

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, 1985; USACOE, 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 Division 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 Web Soil Survey at http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

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 21 and Table 22 shows 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 1.0. 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 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 23 and Table 24 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 verbal 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 1.0. 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 25 and Table 26 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 25, 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 27 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 verbal 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 1.0. 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 (fig. 58) hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Figure 58.—Located along the wooded area in the foreground, is a stock pond. Water facilities are very important in arid west Texas.

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.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

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 Index Properties

Table 28 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 29 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 29, 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 (Ksat) 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 29, 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 29 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 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

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

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are 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 30 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.

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

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter (mmhos/cm) or 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 31 provides 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 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 31 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 31 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 32 provides 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 and Chemical Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in Table 33, and the results of chemical analysis in Table 34. 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 USDA-NRCS National Soil Survey Laboratory, Lincoln, Nebraska; Soil Characterization Laboratory, Texas A&M University at College Station, Texas; and Soil Characterization Laboratory, Texas Tech University, Lubbock, Texas.

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, 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).
Coefficient of linear extensibility—change in clod dimension based on whole soil (3D4).
Bulk density—of less than 2-millimeter material, saran-coated clods field moist (3B1a) ⅓ bar (3B1b) ovendry (3B1c).
Water retained—pressure extraction, percentage of ovendry weight of less than 2-millimeter material; ⅓ bar (3C1) 15 bars (3C2).
Reaction (pH)—1:1 water dilution (4C1a2a1).
Organic carbon—wet combustion. Walkley-Black modified acid-dichromate, ferric sulfate titration (6A1c, obsolete).
Extractable cations—ammonium acetate pH 7.0, ICP; calcium (6N2e, 6N2f) magnesium (6O2d, 6O2e) sodium (6P2b, 6P2c) potassium (6Q2b, 6Q2c).
Cation-exchange capacity—sum of cations (4B4b1).
Base saturation—ammonium acetate, pH 7.0 (4B4c1).
Gypsum—precipitation in acetone (6F1a).
Electrical conductivity—saturation extract (4F2b1).
Exchangeable Sodium Percentage (ESP)—NH_4OAc, pH 7.0.
Sodium adsorption ratio (4F3b).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2003). 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 35 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 Vertisol.

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 Ustert (Ust, meaning burnt, plus ert, from Vertisol).

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 Haplusterts (Hapl, meaning minimal horizonation, plus usterts, the suborder of the Vertisols 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 Haplusterts.

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, smectitic, thermic Typic Haplusterts.

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, 1993) and in the “Field Book for Describing and Sampling Soils” (Schoeneberger and others, 2002). 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, 2003). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Altar Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Flood-plain steps
Parent material: Gravelly alluvium derived from igneous and sedimentary rock
Elevation: 3,500 to 5,000 feet
Slope: 1 to 7 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Ustic Haplocambids

Typical Profile

Typical pedon of Altar gravelly sandy loam in an area of Altar-Bodecker-Riverwash association, 0 to 7 percent slopes, flooded; Casa Piedra, Texas USGS topographic quadrangle; Latitude: 29 degrees, 44 minutes, 52.18 seconds North; Longitude: 104 degrees, 4 minutes, 10.58 seconds West; NAD 83; UTM Easting: 589962 m, UTM Northing: 3291205 m, Zone 13.

A—0 to 10 inches; brown (7.5YR 5/3) gravelly sandy loam, dark brown (7.5YR 3/3) moist; weak fine and medium subangular blocky structure parting to moderate medium granular; hard, very friable, slightly sticky, slightly plastic; 15 percent igneous gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bk1—10 to 26 inches; brown (7.5YR 5/3) extremely gravelly sandy loam, dark brown (7.5YR 3/3) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; hard, friable, slightly sticky, slightly plastic; 75 percent igneous gravel; 4 percent igneous cobbles; violently effervescent; moderately alkaline; gradual wavy boundary.

Bk2—26 to 80 inches; brown (7.5YR 5/3) extremely gravelly fine sandy loam, dark brown (7.5YR 3/3) moist; weak coarse prismatic structure; hard, friable, slightly sticky, slightly plastic; 75 percent igneous gravel; 7 percent igneous cobbles; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 6 dry, 2 to 5 moist
Chroma: 2 to 6, dry or moist
Texture: Sandy loam
Rock fragments: 15 to 80 percent gravels and cobbles
Organic matter: Less than 1 percent
Effervescence: None to violently
Reaction: Moderately acid to neutral

Bk horizon (Bk and BC horizons where present)

Hue: 5YR to 10YR
Value: 2 to 7 dry, 2 to 6 moist
Chroma: 2 to 6, dry or moist
Texture: Sandy loam, loam, sandy clay loam, or clay loam
Clay content: 10 to 30 percent

Rock fragments: 35 to 85 percent gravel and cobble
Effervescence: None to violently
Reaction: Slightly acid to moderately alkaline

C horizon (where present)

Hue: 7.5YR or 10YR
Value: 2 to 6 dry, 2 to 4 moist
Chroma: 2 to 8, dry or moist
Texture: Loam, sandy loam, loamy sand, coarse sand, or sand
Rock fragments: 35 to 90 percent gravel and cobble
Effervescence: None to violently
Reaction: Neutral or slightly alkaline

Baviza Series

Depth class: Very deep
Drainage class: Excessively drained
Slowest soil permeability to 60 inches: Rapid
Landforms: Alluvial fans
Parent material: Sandy fan alluvium derived from igneous rock
Elevation: 1,800 to 3,995 feet
Slope: 1 to 8 percent

Taxonomic Class

Mixed, hyperthermic Ustic Torripsamments

Typical Profile

Typical pedon of Baviza loamy fine sand in an area of Baviza and Pantera soils, 1 to 8 percent slopes, flooded; Adobes, Texas USGS topographic quadrangle; Latitude: 29 degrees, 49 minutes, 39.04 seconds North; Longitude: 104 degrees, 36 minutes, 4.84 seconds West; NAD 83; UTM Easting: 538516 m, UTM Northing: 3299739 m, Zone 13.

A—0 to 3 inches; yellowish brown (10YR 5/4) loamy fine sand, brown (10YR 4/3) moist; weak coarse subangular blocky structure parting to weak fine and medium subangular blocky; loose, very friable, nonsticky and nonplastic; violently effervescent; moderately alkaline; clear smooth boundary.

C1—3 to 29 inches; yellowish brown (10YR 5/4) sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, loose, nonsticky and nonplastic; 1 percent igneous gravel; violently effervescent; moderately alkaline; clear smooth boundary.

C2—29 to 47 inches; yellowish brown (10YR 5/4) gravelly sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, loose, nonsticky and nonplastic; 5 percent distinct white (10YR 8/1) dry, coats of calcium carbonate on rock fragments; 15 percent igneous gravel; violently effervescent; moderately alkaline; clear smooth boundary.

C3—47 to 80 inches; yellowish brown (10YR 5/4) gravelly sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, loose, nonsticky and nonplastic; 5 percent distinct coats of calcium carbonate on rock fragments; 17 percent igneous gravel; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 7, dry; 3 or 4, moist
Chroma: 3 or 4, dry or moist
Texture: Sands or loamy sands
Rock fragments: 0 to 30 percent

Effervescence: None to violently
Reaction: Slightly alkaline to strongly alkaline

C1 horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 or 4 moist
Chroma: 3 or 4, dry or moist
Texture: Sands or loamy sands
Rock fragments: 0 to 30 percent
Effervescence: Slightly to violently
Reaction: Slightly alkaline to strongly alkaline

C2 and C3 horizons

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 or 4 moist
Chroma: 3 or 4, dry or moist
Texture: Dominantly sand, coarse sand, but ranges to loamy fine sand
Rock fragments: 1 to 60 percent
Effervescence: Very slightly to violently
Reaction: Slightly alkaline to strongly alkaline

Berrend Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Fan remnants
Parent material: Loamy alluvium derived from igneous rock
Elevation: 4,500 to 6,695 feet
Slope: 1 to 5 percent

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Calcidic Argiustolls

Typical Profile

Typical pedon of Berrend sandy clay loam in an area of Berrend and Espy soils, 1 to 5 percent slopes; San Esteban Lake, Texas USGS topographic quadrangle; Latitude: 30 degrees, 11 minutes, 38.7 seconds North; Longitude: 104 degrees, 04 minutes, 23.6 seconds West; NAD 83; UTM Easting: 589213 m, UTM Northing: 3340655 m, Zone 13.

A—0 to 2 inches; brown (10YR 4/3) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine and fine pores; 1 percent igneous gravel; noneffervescent; slightly alkaline; clear smooth boundary.

Bt1—2 to 13 inches; brown (10YR 4/3) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular structure; moderately hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine and medium pores; few distinct clay films on faces of peds; 1 percent igneous gravel; noneffervescent; slightly alkaline; clear smooth boundary.

Bt2—13 to 19 inches; brown (7.5YR 4/3) clay loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; common fine and medium pores; few distinct clay films on faces of peds; 1 percent igneous gravel; noneffervescent; slightly alkaline; clear smooth boundary.

Btk—19 to 38 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/3) moist; weak fine and medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; common fine and few medium pores; very few faint clay films on faces of peds; few fine and medium masses of calcium carbonate; 1 percent igneous gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk—38 to 60 inches; light brown (7.5YR 6/3) loam, brown (7.5YR 5/3) moist; weak fine and medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; few fine pores; few distinct coats of calcium carbonate on rock fragments; common medium and coarse masses of calcium carbonate; 5 percent igneous gravel; violently effervescent; moderately alkaline; diffuse wavy boundary.

C—60 to 80 inches; pink (7.5YR 7/4) fine sandy loam, light brown (7.5YR 6/4) moist; massive; soft, very friable, slightly sticky and nonplastic; 5 percent igneous gravel; strongly effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 2 or 3 dry or moist
Texture: Fine sandy loam, sandy loam, loam, or sandy clay loam
Calcium carbonate equivalent: 0 to 10 percent
Rock fragments: 0 to 5 percent
Effervescence: None to slightly
Reaction: Neutral to slightly alkaline

Bt horizon

Hue: 5YR to 10YR
Value: 3 to 5, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Calcium carbonate equivalent: 0 to 10 percent
Rock fragments: 0 to 5 percent
Effervescence: None to slightly
Reaction: Slightly alkaline or moderately alkaline

Btk horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Calcium carbonate equivalent: 5 to 25 percent
Rock fragments: 0 to 5 percent
Effervescence: None to strongly
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 3 to 6 moist
Chroma: 3 or 4 dry or moist
Texture: Sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam
Calcium carbonate equivalent: 10 to 30 percent
Rock fragments: 0 to 15 percent

Effervescence: Strongly or violently
Reaction: Moderately alkaline

C horizon

Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 to 6 moist
Chroma: 3 or 4, dry or moist
Texture: Loamy sand, sandy loam, fine sandy loam, or loam
Calcium carbonate equivalent: 5 to 20 percent
Rock fragments: 0 to 15 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bissett Series

Depth class:
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Mesas, narrow ridges, hills, mountains, escarpments
Parent material: Gravelly residuum and/or colluvium derived from limestone
Elevation: 3,500 to 5,000 feet
Slope: 1 to 60 percent

Taxonomic Class

Loamy-skeletal, carbonatic, thermic Lithic Ustic Haplocalcids

Typical Profile

Typical pedon of Bissett very gravelly loam (fig. 59) in an area of Bissett-Rock outcrop complex, 5 to 16 percent slopes; Brewster County, Texas; Bissett Mountain, Texas USGS topographic quadrangle; Latitude: 30 degrees, 25 minutes, 40.395 seconds North; Longitude: 103 degrees, 27 minutes, 48.738 seconds West; NAD 83; UTM Easting: 647557 m, UTM Northing: 3367203 m, Zone 13.

Ak—0 to 2 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium granular structure; friable, slightly hard; common very fine, common fine, and common medium roots; 5 percent prominent carbonate coats on rock fragments; 35 percent limestone gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk—2 to 9 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium granular structure; friable, slightly hard; common very fine and common fine roots; 20 percent prominent carbonate coats on rock fragments; 45 percent limestone gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.

R—9 to 19 inches; indurated limestone bedrock.

A and Bk horizons

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 or 3, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Clay content: 15 to 30 percent
Rock fragments: 25 to 60 percent, but averages greater than 35 percent
Other features: Coarse fragments have few to many coatings of calcium carbonate and pendants on lower surfaces

Figure 59.—Profile of Bissett very gravelly loam in an area of Bissett-Rock outcrop complex, 20 to 70 percent slopes. Bissett soils contain more than 35 percent coarse fragments, and are shallow soils over limestone. (Scale in centimeters)

Effervescence: Strongly
Reaction: Moderately alkaline

R layer

Kind: Limestone bedrock
Cementation: Indurated

Blackgap Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Hillslopes, mountain slopes, escarpments, mountain slopes
Parent material: Gravelly residuum and/or colluvium derived from limestone
Elevation: 1,800 to 3,995 feet
Slope: 10 to 60

Taxonomic Class

Loamy-skeletal, carbonatic, hyperthermic Lithic Ustic Haplocalcids

Typical Profile

Typical pedon of Blackgap very gravelly silt loam (fig. 60) in an area of Blackgap-Rock outcrop complex, 10 to 30 percent slopes; Brewster County, Texas; Black Gap, Texas USGS topographic quadrangle; Latitude: 29 degrees, 32 minutes, 56.40 seconds North; Longitude: 102 degrees, 55 minutes, 2.87 seconds West; NAD 83; UTM Easting: 701761 m, UTM Northing: 3270733 m, Zone 13.

A—0 to 4 inches; pale brown (10YR 6/3) very gravelly silt loam, brown (10YR 4/3) moist; weak fine granular structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and common fine roots; 10 percent limestone cobbles and 45 percent limestone gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

Ak—4 to 9 inches; pale brown (10YR 6/3) extremely cobbly silt loam, brown (10YR 4/3) moist; weak fine granular structure; friable, hard, slightly sticky, slightly plastic; common fine roots in cracks and common very fine roots in cracks; carbonate coats on rock fragments; 45 percent limestone cobbles and 15 percent limestone gravel; violently effervescent; moderately alkaline; abrupt wavy boundary.

R—9 to 20 inches; indurated limestone bedrock.

A horizon

Hue: 7.5YR to 2.5Y
Value: 5 to 8, 4 to 7 moist
Chroma: 2 to 4, dry or moist
Texture: Silt loam or loam
Clay content: 15 to 27 percent
Calcium carbonate on *Rock fragments:* Faint coats to pendants 1 inch thick

Figure 60.—Profile of Blackgap very gravelly loam in an area of Blackgap-Rock outcrop complex, 10 to 30 percent slopes. Hard limestone bedrock ranges in depth from 7 to 20 inches. (Scale in CM-centimeters, FT-feet)

Rock fragments: 35 to 80 percent; 10 to 35 percent gravel; 20 to 45 percent cobbles; 0 to 20 percent stones
Effervescence: Violently
Reaction: Moderately alkaline

Bk horizon (where present)

Hue: 7.5YR to 2.5Y
Value: 5 to 8 dry, 4 to 7 moist
Chroma: 3 to 5, dry or moist
Texture: Silt loam or loam
Clay content: 15 to 27 percent
Rock fragments: 35 to 80 percent; 10 to 35 percent gravel; 20 to 45 percent cobbles; 0 to 20 percent stones
Effervescence: Violently
Reaction: Moderately alkaline

R layer

Kind: Limestone bedrock
Cementation: Indurated
Fractures: Greater than 4 inches apart
Other features: Secondary calcium carbonate coats on fracture surfaces

Bodecker Series

Depth class: Very deep
Drainage class: Excessively drained
Slowest soil permeability to 60 inches: Rapid
Landforms: Flood plains
Parent material: Sandy and gravelly alluvium derived from igneous and sedimentary rock
Elevation: 3,500 to 5,000 feet
Slope: 0 to 2 percent

Taxonomic Class

Sandy-skeletal, mixed, thermic Ustic Torrifluvents

Typical Profile

Typical pedon of Bodecker very gravelly loamy sand in an area of Altar-Bodecker-Riverwash association, 0 to 7 percent slopes, flooded; Plata, Texas USGS topographic quadrangle Latitude: 29 degrees, 52 minutes, 7.12 seconds North; Longitude: 104 degrees, 3 minutes, 4.3 seconds West; NAD 83; UTM Easting: 591633 m, UTM Northing: 3304608 m, Zone 13.

A—0 to 5 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak fine granular structure; loose, nonsticky and nonplastic; common very fine and fine roots; 35 percent igneous gravel and 10 percent igneous cobbles; slightly effervescent; moderately alkaline; clear wavy boundary.

C1—5 to 30 inches; light brownish gray (10YR 6/2) extremely cobbly coarse sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; common very fine and fine roots; 35 percent igneous gravel and 37 percent igneous cobbles; strongly effervescent; strongly alkaline; clear smooth boundary.

C2—30 to 80 inches; light brownish gray (10YR 6/2) extremely gravelly coarse sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; common very fine and fine roots; 55 percent igneous gravel and 20 percent igneous cobbles; strongly effervescent; strongly alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sand to loam
Rock fragments: 0 to 30 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

C horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sand, sand, loamy sand, loamy coarse sand, and may contain thin strata of finer textured material.
Rock fragments: 35 to 90 percent; 25 to 65 percent gravel, 10 to 40 percent cobbles, 0 to 20 percent stones
Effervescence: Slightly or strongly
Reaction: Slightly alkaline to strongly alkaline

Bodecker Taxadjunct

Depth class: Very deep
Drainage class: Excessively drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Flood plains
Parent material: Sandy and gravelly alluvium derived from igneous and sedimentary rock
Elevation: 3,500 to 5,000 feet
Slope: 0 to 2 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, calcareous, thermic Ustic Torrifluvents

The Bodecker soils in map unit TEA—Tenneco-Bodecker complex, 0 to 3 percent slopes, flooded, are a taxadjunct to the series because they are loamy-skeletal in the upper part of the profile. The Bodecker series is sandy-skeletal, mixed, thermic Ustic Torrifluvents.

Typical Profile

Typical pedon of Bodecker loam in an area of Tenneco-Bodecker complex, 0 to 3 percent slopes, flooded; Puerto Potrillo, Texas USGS topographic quadrangle; Latitude: 29 degrees, 49 minutes, 51.77 seconds North; Longitude: 103 degrees, 57 minutes, 21.16 seconds West; NAD 83; UTM Easting: 600876 m, UTM Northing: 3300522 m, Zone 13.

A—0 to 8 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate thin platy and moderate fine subangular blocky structure; very friable, slightly hard; strongly effervescent; moderately alkaline; abrupt smooth boundary.
Bw—8 to 14 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to weak medium subangular blocky; very friable, slightly hard; strongly effervescent; moderately alkaline; abrupt smooth boundary.
2C1—14 to 35 inches; brown (10YR 5/3) very gravelly coarse sand, brown (10YR 4/3) moist; single grain; 50 percent igneous gravel; slightly effervescent; moderately alkaline; abrupt smooth boundary.

2C2—35 to 80 inches; pale brown (10YR 6/3) gravelly sandy clay loam, brown (10YR 5/3) moist; massive; 29 percent ignimbrite gravel; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, loam, or sandy clay loam
Rock fragments: 0 to 25 percent
Effervescence: Slightly to violently
Reaction: Moderately alkaline

B horizon

Hue: 7.5YR or 10YR
Value: 3 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, loam, sandy clay loam, or clay loam
Rock fragments: 0 to 30 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

C or 2C horizons

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sand to clay loam
Rock fragments: 15 to 75 percent
Effervescence: Slightly to violently
Reaction: Moderately alkaline

Bofecillos Series

Depth class: Very shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Mountains, hills,
Parent material: Gravelly alluvium and/or residuum weathered from basalt
Elevation: 3,500 to 5,000 feet
Slope: 1 to 12 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Bofecillos very gravelly sandy clay loam in an area of Horsetrap-Bofecillos-Rock outcrop complex, 1 to 12 percent slopes; Sauceda Ranch USGS topographic quadrangle; Latitude: 29 degrees, 27 minutes, 12.488 seconds, North; Longitude: 103 degrees, 54 minutes, 33.459 seconds; West; NAD 83; UTM Easting: 605771 m, UTM Northing: 3258723 m, Zone 13.

A—0 to 4 inches; brown (10YR 5/3) very gravelly sandy clay loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure parting to weak fine subangular blocky structure; common very fine roots throughout; 1 percent fine irregular carbonate nodules around rock fragments; 55 percent subangular basalt

gravels with thin coatings of carbonate; strongly effervescent; slightly alkaline; very abrupt smooth boundary.

R—4 14 inches; gray (10YR 5/1) basalt bedrock; slightly effervescent

A horizon

Hue: 7.5YR, 10YR or 2.5Y
Value: 4 to 6 dry, 2 to 4, moist
Chroma: 2 or 3, dry or moist
Texture: Sandy clay loam or loam
Rock fragments: 35 to 80 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline to strongly alkaline

R layer

Kind: Basalt bedrock

Boludo Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Dissected dip slopes on cuestas, dip slopes, mesas
Parent material: Gravelly residuum weathered from ignimbrite
Elevation: 3,500 to 5,000 feet
Slope: 1 to 8 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Calcic Lithic Petrocalcids

Typical Profile

Typical pedon of Boludo very gravelly clay loam in an area of Sauceda and Boludo soils, 1 to 8 percent slopes; Bandera Mesa North, Texas USGS quadrangle; Latitude: 29 degrees, 37 minutes, 45 seconds North; Longitude: 103 degrees, 46 minutes, 46 seconds West; NAD 83; UTM Easting: 618050 m, UTM Northing: 3278339 m, Zone 13.

A—0 to 4 inches; grayish brown (10YR 5/2) very gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular and moderate medium subangular blocky structure; firm, hard, moderately sticky, moderately plastic; many very fine roots and many fine roots; 20 percent caliche cobbles and 20 percent caliche gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Bk—4 to 11 inches; brown (10YR 4/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate fine granular structure, and moderate fine and medium subangular blocky structure; firm, hard, moderately sticky, moderately plastic; many very fine roots and many fine roots; 20 percent caliche cobbles and 30 percent caliche gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bkkm—11 to 17 inches; white (10YR 8/1) very strongly cemented material, white (10YR 8/1) moist; violently effervescent; moderately alkaline; abrupt smooth boundary.

R—17 to 27 inches; pinkish white (7.5YR 8/2) indurated ignimbrite bedrock, pinkish gray (7.5YR 7/2) moist.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, dry or moist
Chroma: 2 or 3, dry or moist
Texture: Loam or clay loam

Rock fragments: 35 to 80 percent, ignimbrite and detached caliche
Effervescence: Slightly to violently
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam or clay loam
Rock fragments: 45 to 80 percent, ignimbrite and detached caliche
Calcium carbonate equivalent: 20 to 40 percent
Effervescence: Slightly to violently
Reaction: Moderately alkaline

Bkm horizon

Kind: Caliche
Cementation: Strongly or very strongly cemented
Other features: Most pedons have an indurated laminar cap 1 to 5 mm thick

R layer

Kind: Unweathered Mitchell Mesa Ignimbrite
Cementation: Indurated

Boracho Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Fan piedmonts
Parent material: Gravelly alluvium derived from igneous rock
Elevation: 4,500 to 6,695 feet
Slope: 1 to 16 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic, shallow Petrocalcic Calciustolls

Typical Profile

Typical pedon of Boracho very gravelly sandy clay loam, in an area of Boracho-Espy complex, 1 to 8 percent slopes; Cieneguita, Texas USGS topographic quadrangle; Latitude: 29 degrees, 59 minutes, 19.43 seconds North; Longitude: 104 degrees, 21 minutes, 4.09 seconds West; NAD 83; UTM Easting: 562589 m, UTM Northing: 3317714 m, Zone 13.

A—0 to 7 inches; dark brown (10YR 3/3) very gravelly sandy clay loam, very dark brown (10YR 2/2) moist; 48 percent igneous fragments; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bk—7 to 15 inches; brown (10YR 4/3) extremely gravelly sandy clay loam, dark brown (10YR 3/3) moist; 80 percent igneous fragments; violently effervescent; moderately alkaline; abrupt wavy boundary.

Bkkm—15 to 19 inches; indurated, laminar cap, white (10YR 8/1) strongly cemented caliche, white (10YR 8/1) moist; violently effervescent; moderately alkaline; clear smooth boundary.

BCk—19 to 41 inches; pale brown (10YR 6/3) extremely gravelly sandy clay loam, brown (10YR 4/3) moist; 70 percent igneous fragments; violently effervescent; moderately alkaline.

A and Bk horizons

Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 to 4 moist
Chroma: 2 or 3, dry or moist
Texture: Sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam
Clay content: 10 to 35 percent above the petrocalcic horizon and 2 to 10 percent below
Rock fragments: 35 to 65 percent, caliche or igneous
Other features: Some pedons have very thin surface layers that contain less rock fragments
Secondary carbonates: 2 to 15 percent masses or concretions
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bkm horizon

Hue: 5YR to 10YR
Value: 7 to 8, dry or moist
Chroma: 1 to 3, dry or moist
Other features: Upper 1/4 to 2 inches is laminar, and the lower part ranges from indurated to strongly cemented caliche containing igneous fragments.
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

BCk horizon

Hue: 5YR to 10YR
Value: 6 to 8 dry, 4 to 7 moist
Chroma: 1 to 3, dry or moist
Texture: Sandy loam, sandy clay loam, or loam
Rock fragments: 35 to 75 percent, gravel and cobbles
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Borunda Series

Depth class: Moderately deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Pediments, fan remnants
Parent material: Loamy residuum and/or pedisediment derived from tuff
Elevation: 3,500 to 5,000 feet
Slope: 1 to 8 percent

Taxonomic Class

Fine, mixed, superactive, thermic Ustic Calcigypsids

Typical Profile

Typical pedon of Borunda loam in an area of Borunda soils, 1 to 8 percent slopes; Brewster County, Texas; Buck Hills, Texas USGS topographic quadrangle; Latitude: 29 degrees, 48 minutes, 34.00 seconds North; Longitude: 103 degrees, 37 minutes, 29.00 seconds West; NAD 83; UTM Easting: 632992 m, UTM Northing: 3298534 m, Zone 13.

A—0 to 3 inches; light brown (7.5YR 6/3) loam, brown (7.5YR 5/3) moist; weak thin platy and weak fine and medium subangular blocky structure; friable, slightly hard; common very fine and fine roots; common very fine and fine vesicular pores; 7 percent chert gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk—3 to 12 inches; pinkish gray (7.5YR 7/2) clay, light brown (7.5YR 6/3) moist; weak fine and medium subangular blocky structure, and weak fine subangular blocky

structure; firm, hard; common very fine, fine and medium roots; common fine and medium tubular and common very fine tubular pores; 1 percent distinct white (10YR 8/1) carbonate coats on faces of peds; 1 percent fine threadlike white (10YR 8/1) carbonate threads between peds; 2 percent chert gravel; violently effervescent; strongly alkaline; clear smooth boundary.

Bky—12 to 28 inches; pinkish gray (7.5YR 7/2) clay, light brown (7.5YR 6/3) moist; weak medium and coarse subangular blocky structure parting to weak fine and medium subangular blocky; firm, hard; few very fine and fine roots; common fine and medium tubular and common very fine tubular pores; 10 percent distinct white (10YR 8/1) carbonate coats on faces of peds and 30 percent distinct white (10YR 8/1) carbonate coats on rock fragments; 3 percent medium threadlike white (10YR 8/1) carbonate threads between peds and 3 percent coarse irregular white (10YR 8/1) carbonate masses between peds; 2 percent visible gypsum crystals; 2 percent chert gravel, 30 percent tuff gravel; violently effervescent; strongly alkaline; clear wavy boundary.

Crk—28 to 40 inches; weathered tuff bedrock, light gray (10YR 7/1) gray (10YR 5/1) moist; massive; moderately cemented; few very fine and fine roots in cracks; 10 percent prominent white (10YR 8/1) carbonate coats on upper surfaces of peds or rocks; 3 percent medium threadlike white (10YR 8/1) carbonate threads in cracks and 3 percent coarse irregular white (10YR 8/1) carbonate masses in cracks; violently effervescent; clear smooth boundary.

Rk—40 to 51 inches; weathered tuff bedrock, light gray (10YR 7/1) gray (10YR 5/1) moist; massive; strongly cemented; few very fine and fine roots in cracks; 10 percent prominent white (10YR 8/1) carbonate coats on upper surfaces of peds or rocks; 3 percent medium threadlike white (10YR 8/1) carbonate threads in cracks; strongly effervescent; clear smooth boundary.

R—51 to 62 inches; light gray (10YR 7/1) slightly weathered tuff bedrock, gray (10YR 5/1) moist; massive; strongly cemented; few very fine and fine roots in cracks; strongly effervescent.

A horizon

Hue: 5YR to 10YR
Value: 5 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam, clay loam, or silty clay loam
Calcium carbonate: Films and threads range from none to 3 percent by volume in the lower part
Calcium carbonate equivalent: 5 to 20 percent by volume
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bw horizon (where present)

Hue: 5YR to 10YR
Value: 5 to 7, dry or moist
Chroma: 3 to 5, dry or moist
Texture: Clay, clay loam or silty clay loam
Calcium carbonate: Films and threads range from none to 2 percent by volume
Calcium carbonate equivalent: 5 to 20 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 5YR to 10YR
Value: 6 or 7, dry or moist
Chroma: 2 to 4, dry or moist

Texture: Silty clay loam, clay loam, or clay
Calcium carbonate: Masses, films, threads, and concretions that range from 2 to 10 percent by volume
Calcium carbonate equivalent: 15 to 40 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Bky horizon

Hue: 5YR to 10YR
Value: 6 or 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Silty clay loam, clay loam, or clay
Calcium carbonate: Masses, films, threads, and concretions that range from 2 to 10 percent by volume
Calcium carbonate equivalent: 15 to 40 percent
Visible forms of gypsum: 1 to 5 percent by volume
Gypsum content: 5 to 20 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

C horizon (where present)

Hue: 5YR to 2.5Y
Value: 5 to 7, dry or moist
Chroma: 1 to 4, dry or moist
Texture: Clay, clay loam, or silty clay loam
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Cr and R horizons

Kind: Tuff bedrock

Brewster Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Hills, mountains, erosion remnants
Parent material: Gravelly residuum weathered from trachyte and/or basalt
Elevation: 4,500 to 6,695 feet
Slope: 1 to 60 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Aridic Lithic Haplustolls

Typical Profile

Typical pedon of Brewster very cobbly loam in an area of Brewster-Rock outcrop complex, 20 to 70 percent slopes; Bird Mountain, Texas USGS topographic quadrangle; Latitude: 30 degrees, 18 minutes, 2.60 seconds North; Longitude: 103 degrees, 36 minutes, 1.70 seconds West; NAD 83; UTM Easting: 634604 m, UTM Northing: 3352907 m, Zone 13.

A1—0 to 4 inches; brown (7.5YR 4/2) very cobbly loam, dark brown (7.5YR 3/2) moist; friable, hard, moderately sticky, moderately plastic; common very fine roots throughout; 50 percent trachyte cobbles; neutral; clear smooth boundary.
A2—4 to 11 inches; brown (7.5YR 4/2) very cobbly clay loam, dark brown (7.5YR 3/2) moist; friable, hard, moderately sticky, moderately plastic; common very fine roots in

cracks; 10 percent distinct pressure faces; 50 percent trachyte cobbles; slightly alkaline; abrupt wavy boundary.

R—11 to 20 inches; indurated trachyte bedrock.

A horizon

Hue: 5YR to 10YR
Value: 3 to 5, dry or moist
Chroma: 2 or 3, dry or moist
Texture: Loam, silt loam, sandy clay loam, or clay loam
Clay content: 18 to 35 percent clay
Other features: Few films or distinct coatings of calcium carbonate are on the faces of the fracture planes in the bedrock in some pedons
Rock fragments: 35 to 80
Secondary calcium carbonate: Less than 5 percent
Reaction: Neutral or slightly alkaline

R layer

Kind: Rhyolitic, trachytic, basaltic, and quartzilic bedrock

Buckear Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Hills
Parent material: Gravelly residuum weathered from shale
Elevation: 3,500 to 5,000 feet
Slope: 5 to 30 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, calcareous, thermic, shallow Ustic Torriorthents

Typical Profile

Typical pedon of Buckear very gravelly loam in an area of Buckear-Coyanosa complex, 5 to 16 percent slopes; The Solitario, Texas USGS topographic quadrangle; Latitude: 29 degrees, 28 minutes, 8.78 seconds North; Longitude: 103 degrees, 49 minutes, 25.79 seconds West; NAD 83; UTM Easting: 614042 m, UTM Northing: 3260536 m, Zone 13.

A—0 to 7 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and common fine roots; 40 percent nonflat angular strongly cemented sandstone gravels; strongly effervescent; moderately alkaline; clear smooth boundary.

Cr—7 to 22 inches; moderately cemented calcareous weathered shale bedrock, fractured at intervals of 10 to less than 45 centimeters; high excavation difficulty, strongly effervescent.

A horizon

Hue: 10YR or 2.5Y
Value: 3 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, loam, or sandy clay loam
Clay content: 10 to 27 percent
Rock fragments: 35 to 75 percent mainly chert, sandstone, and shale

Effervescence: None
Reaction: Slightly alkaline or moderately alkaline

CR layer

Kind: Thinly plated weathered shale bedrock that is tilted at 60 to 80 degrees from the horizontal

Butcherknife Series

Depth class: Deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Slow
Landforms: Alluvial flats, inset fans
Parent material: Clayey alluvium derived from tuff
Elevation: 3,500 to 5,000 feet
Slope: 0 to 3 percent

Taxonomic Class

Fine, mixed, superactive, thermic Ustic Calcigypsids

Typical Profile

Typical pedon of Butcherknife silty clay loam in an area of Martillo and Butcherknife soils, 0 to 3 percent slopes; Whirlwind Spring, Texas USGS topographic quadrangle; Latitude: 29 degrees, 52 minutes, 23 seconds North; Longitude: 103 degrees, 34 minutes, 41 seconds, West; NAD 83; UTM Easting: 637326 m, UTM Northing: 3305576 m, Zone 13.

A—0 to 4 inches; brown (7.5YR 5/3) silty clay loam, brown (7.5YR 4/3) moist; moderate very fine and fine granular, and moderate medium and fine subangular blocky structure; firm, hard, moderately sticky, moderately plastic; common fine roots; strongly effervescent; moderately alkaline; clear smooth boundary.

Bw1—4 to 12 inches; brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; weak coarse prismatic parting to moderate coarse and fine angular blocky; very firm, very hard, very sticky, very plastic; common fine roots; violently effervescent; moderately alkaline; clear smooth boundary.

Bw2—12 to 22 inches; brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; weak coarse prismatic structure parting to moderate coarse and medium angular blocky structure; very firm, very hard, very sticky, very plastic; common very fine and common fine roots; 20 percent distinct pressure faces on all faces of peds; violently effervescent; moderately alkaline; clear smooth boundary.

Bkyz—22 to 30 inches; brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; weak coarse subangular blocky structure parting to moderate medium subangular blocky; very hard, very firm, very sticky and very plastic; few very fine roots; common fine and medium irregular masses of calcium carbonate, gypsum, and other salts throughout and between peds; moderately saline; 25 percent gypsum; 30 percent noncemented tuff fragments, gravel size, that slake in water; 10 percent calcium carbonate equivalent; violently effervescent; moderately alkaline; clear smooth boundary.

BCkyz1—30 to 37 inches; pinkish gray (7.5YR 6/2) clay loam, brown (7.5YR 4/2) moist; weak medium and coarse subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine roots; few prominent very pale brown (10YR 8/2) coatings of calcium carbonate on surfaces of peds; common fine and medium irregular masses of calcium carbonate, gypsum, and other salts throughout common fine and medium threads of soft calcium carbonate, gypsum, and other salts between peds; moderately saline; 20 percent gypsum; 60 percent noncemented tuff fragments, gravel size, that slake in water; 27 percent calcium carbonate equivalent; violently effervescent; moderately alkaline; clear smooth boundary.

BCkyz2—37 to 41 inches; pinkish gray (7.5YR 6/2) clay loam, brown (7.5YR 4/2), moist; weak coarse and medium subangular blocky structure; firm, hard, moderately sticky, moderately plastic; few very fine roots; 1 percent prominent carbonate coats on all faces of peds; common fine and medium irregular masses of calcium carbonate, gypsum, and other salts throughout common fine and medium threads of soft calcium carbonate, gypsum, and other salts between peds; 20 percent gypsum; 75 percent noncemented tuff fragments, gravel size, that slake in water; violently effervescent; moderately alkaline; clear smooth boundary.

Cr1—41 to 48 inches; weathered tuff bedrock, gray (5YR 5/1), moderately cemented; massive; 1 percent carbonate coats on bedrock; moderately alkaline; abrupt smooth boundary.

Cr2—48 to 59 inches; weathered tuff bedrock, gray (5YR 5/1), moderately cemented; massive; 1 percent carbonate coats on bedrock; moderately alkaline; abrupt smooth boundary.

Cr3—59 to 80 inches; unweathered tuff bedrock, gray (5YR 6/1), moderately cemented; massive; 1 percent carbonate coats on bedrock; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Clay loam, silty clay loam, or silty clay
Other features: Some pedons have moist chroma less than 3.5, but the epipedon is not moist for 90 cumulative days in most years.
Calcium carbonate equivalent: 1 to 5 percent by volume
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bw horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Silty clay or clay
Clay content: 40 to 55 percent
Cracks: Common, but slickensides and wedge-shaped peds are not present
Calcium carbonate equivalent: 5 to 15 percent by volume
EC (dS/m): 2 to 8
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bkyz horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Silty clay loam, silty clay, or clay
Clay content: 30 to 45 percent
Calcium carbonate equivalent: 5 to 15 percent by volume
Gypsum content: 5 to 25 percent
EC (dS/m): 4 to 16
Effervescence: Strongly or violently
Reaction: Moderately alkaline

BCkyz or CBkyz horizons where present

Hue: 7.5YR or 10YR

Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam or clay loam
Clay content: 20 to 35 percent
Calcium carbonate equivalent: 25 to 40 percent by volume
Gypsum content: 10 to 25 percent
EC (dS/m): 8 to 16
Effervescence: Strongly or violently
Reaction: Moderately alkaline

CR layer

Kind: Tuff bedrock of the Duff and Pruett Formation

Castolon Series

Depth class: Very deep
Drainage class: Moderately well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Flood plains
Parent material: Loamy alluvium derived from igneous and sedimentary rock
Elevation: 1,800 to 3,995 feet
Slope: 0 to 1 percent

Taxonomic Class

Fine-silty, mixed, superactive, calcareous, hyperthermic Ustic Torrifluvents

Typical Profile

Typical pedon of Castolon silty clay loam in an area of Castolon silty clay loam, 0 to 1 percent slopes, occasionally flooded; Presidio East, Texas USGS topographic quadrangle; Latitude: 29 degrees, 24 minutes, 29 seconds North; Longitude: 103 degrees, 12 minutes, 30 seconds west; NAD 1983; UTM Easting: 673833 m, UTM Northing; 3254531 m, Zone 13.

Ap1—0 to 4 inches; brown (10YR 4/3) silty clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; strongly effervescent; moderately alkaline; abrupt wavy boundary.

Ap2—4 to 11 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; firm; common fine roots and few medium roots; few fine low continuity tubular pores; 1 percent fine platy brown (10YR 4/3) clay bodies in cracks; 1 percent medium irregular brown (10YR 4/3) wormcasts; strongly effervescent; moderately alkaline; abrupt smooth boundary.

C1—11 to 23 inches; brown (10YR 4/3) silty clay loam, dark brown (10YR 3/3) moist; massive; friable; common fine roots and few medium roots; common fine moderate continuity tubular pores; strongly effervescent; moderately alkaline; abrupt wavy boundary.

C2—23 to 31 inches; very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; massive; very friable; common fine roots and few medium roots; common fine and medium moderate continuity tubular pores; 1 percent fine threadlike brown (7.5YR 4/3) masses of oxidized iron with sharp boundaries; strongly effervescent; moderately alkaline; abrupt wavy boundary.

C3—31 to 48 inches; very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; massive; very friable; common fine roots and few medium roots; common fine low continuity tubular pores; 2 percent fine cylindrical brown (7.5YR 4/3) masses of oxidized iron with sharp boundaries, 10 percent medium irregular dark grayish brown (10YR 4/2) masses of oxidized iron with clear boundaries, 10 percent medium

irregular very dark brown (7.5YR 2.5/2) masses of oxidized iron with sharp boundaries; strongly effervescent; moderately alkaline; abrupt smooth boundary.

C4—48 to 62 inches; brown (10YR 5/3) silty clay loam, dark brown (10YR 4/3) moist; massive; friable; few fine roots; common fine and medium low continuity tubular pores; 1 percent distinct black (10YR 2/1) moist, organic stains on surfaces along pores; 1 percent fine cylindrical brown (7.5YR 4/3) masses of oxidized iron with sharp boundaries on surfaces along root channels, 5 percent coarse cylindrical dark grayish brown (10YR 4/2) redox depletions with clear boundaries on surfaces along root channels; strongly effervescent; moderately alkaline; abrupt smooth boundary.

C5—62 to 80 inches; brown (10YR 5/3) silt loam, dark brown (10YR 4/3) moist; massive; friable; few fine roots; common fine low continuity tubular pores; 2 percent distinct black (10YR 2/1) moist, organic stains on surfaces along pores; 10 percent fine cylindrical brown (7.5YR 4/3) masses of oxidized iron with sharp boundaries on surfaces along root channels; 15 percent coarse cylindrical dark grayish brown (10YR 4/2) redox depletions with clear boundaries on surfaces along root channels; strongly effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 3 to 5, dry or moist
Chroma: 3 or 4, dry or moist
Texture: Loam, silt loam, silty clay loam, clay loam, or clay
Clay content: 5 to 45 percent
Effervescence: Slightly to strongly
Reaction: Slightly alkaline or moderately alkaline

C horizon

Hue: 10YR
Value: 3 to 7, dry or moist
Chroma: 2 to 5, dry or moist
Texture: Silt, silt loam, silty clay loam, loam, clay loam, silty clay, or clay
Clay content: 18 to 45 percent
Redox concentrations: Few to many in shades of brown or yellow
Redox depletions: None to common in shades of gray
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Catto Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Ridges, hillslopes
Parent material: Gravelly residuum and/or colluvium derived from chert
Elevation: 3,500 to 5,000 feet
Slope: 30 to 45 percent

Taxonomic Class

Loamy-skeletal, mixed, active, nonacid, thermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Catto very gravelly clay loam in an area of Catto-Buckear-Rock outcrop complex, 20 to 60 percent slopes; Brewster County, Texas; Heart Mountain, Texas USGS topographic quadrangle; Latitude: 29 degrees, 59 minutes, 47 seconds North;

Longitude: 103 degrees, 13 minutes, 59 seconds West; NAD 83; UTM Easting: 670518 m, UTM Northing: 3319849 m, Zone 13.

A—0 to 7 inches; brown (7.5YR 4/2) very gravelly clay loam, dark brown (7.5YR 3/2) moist; moderate medium subangular and moderate medium granular structure; very friable, slightly hard, moderately sticky, moderately plastic; common very fine and common fine roots; 50 percent chert gravel; slightly alkaline; abrupt irregular boundary.

R—7 to 17 inches; fractured chert bedrock.

A horizon

Hue: 5YR to 10YR
Value: 2 to 4, dry or moist
Chroma: 2 or 3, dry or moist
Texture: Loam or clay loam
Clay content: 20 to 35 percent
Rock fragments: 35 to 65 percent; 0 to 15 percent stones; 5 to 50 percent cobbles; and 25 to 60 percent gravel
Reaction: Slightly alkaline or moderately alkaline

R layer

Kind: Fractured chert bedrock
Other features: In some pedons, the chert bedrock is stratified with shale
Hardness: Between 5 and 7 on Moh's scale

Chilicotal Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Relict alluvial fans, fan remnants
Parent material: Gravelly fan alluvium derived from igneous rock
Elevation: 3,500 to 5,000 feet
Slope: 1 to 30 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Ustic Haplocalcids

Typical Profile

Chilicotal very gravelly fine sandy loam (fig. 61) in an area of Chilicotal very gravelly fine sandy loam, 1 to 8 percent slopes; Brewster County, Texas Panther Junction, Texas USGS topographic quadrangle; Latitude: 29 degrees, 21 minutes, 57.00 seconds North; Longitude: 103 degrees 13 minutes 31.00 seconds West; NAD 83; UTM Easting: 672072 m, UTM Northing: 3249676 m, Zone 13.

A—0 to 2 inches; brown (7.5YR 5/4) very gravelly fine sandy loam, brown (7.5YR 4/4) moist; weak fine granular structure; very friable, slightly hard; many fine and medium roots; 40 percent igneous gravel; slightly effervescent; moderately alkaline; abrupt smooth boundary.

Bw—2 to 7 inches; brown (7.5YR 4/4) very gravelly loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; very friable, slightly hard; common fine roots; 1 percent fine threadlike carbonate, finely disseminated; 40 percent igneous gravel; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—7 to 14 inches; brown (7.5YR 5/4) very gravelly loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; friable, slightly hard; common fine roots; carbonate coats on bottom surfaces of rock fragments; 10 percent threadlike

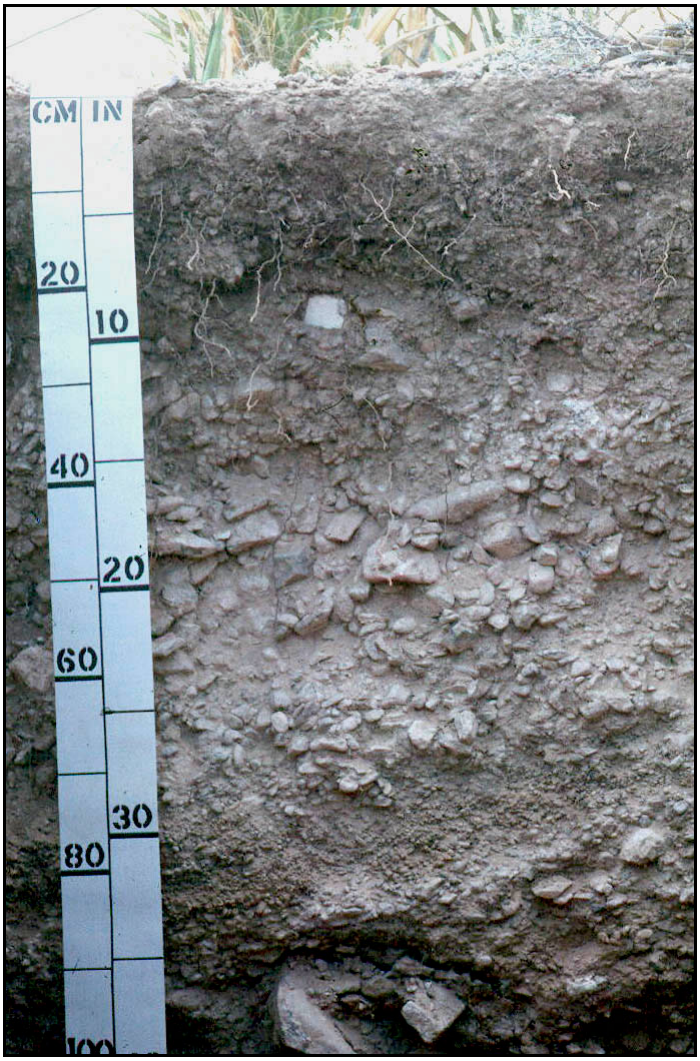

Figure 61—Chilicotal very gravelly fine sandy loam in an area of Chilicotal very gravelly fine sandy loam, 1 to 8 percent slopes. Rock fragments comprise more than 35 percent of the 10 to 40 inch control section. (Scale in CM—centimeters, IN—inches)

carbonate, finely disseminated; 2 percent igneous cobbles and 50 percent igneous gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk2—14 to 28 inches; brown (7.5YR 5/4) very gravelly loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; friable, slightly hard; common fine roots; carbonate coats on rock fragments; 15 percent threadlike carbonate, finely disseminated; 55 percent igneous gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk3—28 to 40 inches; light brown (7.5YR 6/4) extremely gravelly loam, brown (7.5YR 5/4) moist; weak very fine granular structure; friable, very hard; few very fine roots; 5 percent carbonate coats on rock fragments; 70 percent igneous gravel; upper 7 cm is weakly cemented, becoming moderately cemented in lower part; violently effervescent; moderately alkaline; clear smooth boundary.

Bk4—40 to 51 inches; pink (7.5YR 7/4) very gravelly sandy loam, brown (7.5YR 5/4) moist; weak very fine granular structure; very friable, slightly hard; few very fine roots; carbonate coats on rock fragments; 50 percent igneous gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Bk5—51 to 61 inches; pink (7.5YR 7/4) extremely gravelly sandy loam, brown (7.5YR 5/4) moist; weak very fine granular structure; friable, slightly hard; few very fine roots; 15 percent carbonate coats on rock fragments; 70 percent igneous gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bk6—61 to 80 inches; pink (7.5YR 7/4) extremely gravelly sandy loam, light brown (7.5YR 6/4) moist; weak very fine granular structure; extremely hard, very friable, roots penetrate only between peds; 65 percent igneous gravel, 5 percent igneous cobbles; violently effervescent; moderately alkaline.

A and Bw horizons

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, sandy clay loam, or loam
Rock fragments: 20 to about 70 percent
Calcium carbonate equivalent: 2 to 15 percent
Effervescence: Slightly to violently
Reaction: Moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, loam, or sandy clay loam
Rock fragments: 35 to 70 percent
Calcium carbonate equivalent: 15 to 25 percent
Other features: Below 40 inches most pedons have underlying layers of varying thickness, fine earth texture, and size and content of coarse fragments
Effervescence: Strongly or violently
Reaction: Moderately alkaline in the upper part to strongly alkaline in the lower part

Chilimol Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Fan piedmonts
Parent material: Gravelly alluvium derived from igneous rock
Elevation: 4,500 to 6,695 feet
Slope: 1 to 8 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Aridic Calciustolls

Typical Profile

Typical pedon of Chilimol very gravelly loam in an area of Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes; from Nancy Anne Ranch, Texas USGS topographic quadrangle; Latitude: 30 degrees, 27 minutes, 48.58 seconds North; Longitude: 104 degrees, 37 minutes, 5.61 seconds West, NAD83; UTM Easting: 536649 m, UTM Northing: 3370208 m, Zone 13.

A1—0 to 1 inch; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable; 2 percent fine masses of calcium carbonate; 45 percent igneous gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

A2—1 to 10 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable; 2 percent fine masses of calcium carbonate; 45 percent igneous gravel; violently effervescent; moderately alkaline; clear wavy boundary.

Bk1—10 to 22 inches; brown (7.5YR 5/4) very gravelly loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable; 10 percent medium masses of calcium carbonate; 45 percent igneous gravel; violently effervescent; moderately alkaline; clear wavy boundary.

Bk2—22 to 48 inches; light brown (7.5YR 6/4) very gravelly loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable; 20 percent medium masses of calcium carbonate; 40 percent igneous gravel; violently effervescent; moderately alkaline; clear wavy boundary.

Bk3—48 to 80 inches; pink (7.5YR 7/4) very gravelly loam, light brown (7.5YR 6/4) moist; weak medium subangular blocky structure; slightly hard, friable; 20 percent medium masses of calcium carbonate; 40 percent igneous gravel; violently effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: Sandy loam, loam, or silt loam
Rock fragments: 20 to 70 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bw horizon (where present)

Hue: 10YR
Value: 4 or 5 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, loam, or silt loam
Rock fragments: 25 to 60 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 2 to 6 dry, 3 to 6 moist
Texture: Loam, silt loam, sandy clay loam, or clay loam
Rock fragments: 15 to 75 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Chinati Series

Depth class: Shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: fan remnants
Parent material: Gravelly alluvium and/or residuum weathered from fanglomerate
Elevation: 4,500 to 6,695 feet
Slope: 1 to 20 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic, shallow Petrocalcic Paleustolls

Typical Profile

Typical pedon of Chinati very gravelly loam in an area of Chinati, Boracho, and Berrend soils, 1 to 15 percent slopes; Oak Hills South, Texas USGS topographic quadrangle; Latitude: 30 degrees, 8 minutes, 53.5 seconds North; Longitude: 104 degrees, 20 minutes, 46.7 seconds West; NAD 83; UTM Easting: 562953 m, UTM Northing: 3335386 m, Zone 13.

A—0 to 3 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky and weak thin platy structure; very friable, soft, nonsticky, and nonplastic; common very fine and fine roots; 35 percent igneous gravel and 5 percent igneous cobbles; very slightly effervescent; slightly alkaline; abrupt smooth boundary.

Bt—3 to 12 inches; dark brown (7.5YR 3/2) very gravelly loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; common very fine and fine roots; 10 percent distinct clay films on all faces of peds; 35 percent igneous gravel and 5 percent igneous cobbles; strongly effervescent; slightly alkaline; abrupt smooth boundary.

Bkkm—12 to 21 inches; white (7.5YR 8/1) cemented material, light gray (7.5YR 7/1) moist; strongly cemented by carbonates; very few very fine roots; 50 percent fine distinct platy moderately cemented carbonate masses with clear boundaries; 30 percent igneous gravel and 10 percent igneous cobbles; high excavation difficulty; violently effervescent; moderately alkaline; abrupt wavy boundary.

R—21 to 47 inches; brown (7.5YR 5/3) strongly cemented fanglomerate bedrock, brown (7.5YR 4/3) moist; very high excavation difficulty; violently effervescent; moderately alkaline.

A horizon

Hue: 5YR to 10YR
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: Sandy loam, fine sandy loam, very fine sandy loam, loam, sandy clay loam, or clay loam
Rock fragments: 30 to 70 percent
Effervescence: None or slightly
Reaction: Slightly alkaline

Bt horizon

Hue: 5YR to 10YR
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Rock fragments: 35 to 75 percent
Effervescence: None to strongly
Reaction: Slightly alkaline

Btk horizon (where present)

Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2.5 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Rock fragments: 35 to 60 percent

Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bkkm horizon

Hue: 7.5YR or 10YR
Value: 8 dry, 7 or 8 moist
Chroma: 1 to 3, dry or moist
Cementation: Weakly to strongly
Effervescence: Violently
Reaction: Moderately alkaline

R layer

Kind: Fanglomerate
Hue: 5YR to 10YR
Value: 5 to 8 dry, 4 to 8 moist
Chroma: 1 to 4, dry or moist
Cementation: Strongly to indurated

Corazones Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Fan remnants
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock
Elevation: 1,800 to 3,995 feet
Slope: 1 to 50 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, hyperthermic Ustic Haplocalcids

Typical Profile

Typical pedon of Corazones gravelly sandy loam (fig. 62) in an area of Corazones and Ojinaga soils, 1 to 12 percent slopes, Adobes, Texas, USGS topographic quadrangle; Latitude: 29 degrees, 51 minutes, 12.50 seconds North; Longitude: 104 degrees 35 minutes 27.10 seconds west; NAD 83; UTM Easting: 539519 m, UTM Northing: 3302619 m, Zone 13.

A—0 to 2 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; few very fine pores; 1 percent carbonate coats on rock fragments; 1 percent carbonate masses and 1 percent carbonate nodules on bottom of rock fragments; 27 percent igneous gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bk1—2 to 12 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; few fine and common very fine pores; 3 percent carbonate coats on rock fragments; 3 percent carbonate masses and 3 percent carbonate nodules on bottom of rock fragments; 37 percent igneous gravel; violently effervescent; moderately alkaline; clear wavy boundary.

Bk2—12 to 25 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; few fine and common very fine pores; 7 percent carbonate coats on rock fragments; 6 percent carbonate nodules on bottom of rock fragments; 5 percent igneous cobbles and 60 percent igneous gravel; violently effervescent; moderately alkaline; gradual wavy boundary.

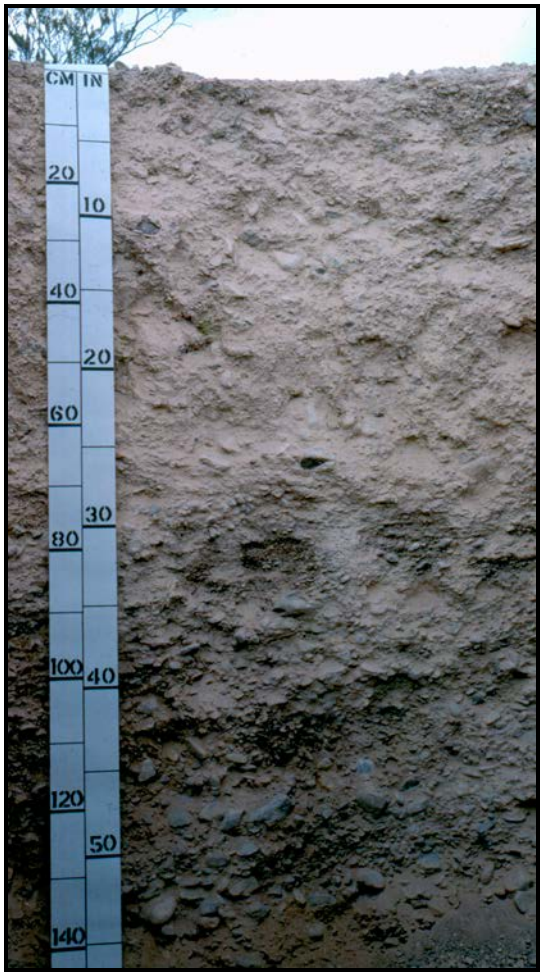

Figure 62.—Profile of Corazones very gravelly sandy loam in an area of Corazones very gravelly sandy loam, 1 to 8 percent slopes. Corazones soils formed in gravelly alluvium, and are on pediments. The gravels are readily observable at a depth of 30 inches (76 cm). (Scale in CM-centimeters, IN-inches)

Bk3—25 to 49 inches; pale brown (10YR 6/3) extremely gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; common fine and common very fine pores; 7 percent carbonate coats on rock fragments; 3 percent carbonate nodules on bottom of rock fragments; 60 percent igneous gravel; violently effervescent; moderately alkaline; gradual wavy boundary.

Bk4—49 to 80 inches; light yellowish brown (10YR 6/4) extremely gravelly loamy coarse sand; yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few calcium carbonate coatings on rock fragments; few fine and medium cylindrical gypsum crystals; 60 percent igneous gravel; 10 percent igneous cobbles and 5 percent limestone cobbles; strongly effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam or loam
Rock fragments: 15 to 60 percent and are 1 to 3 inches in diameter

Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 8, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loamy coarse sand, loamy sand, coarse sandy loam, sandy loam, or loam
Rock fragments: 35 to 80 percent
Calcium carbonate content: 15 to 30 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Costavar Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Hills
Parent material: Gravelly residuum weathered from basalt and/or ignimbrite
Elevation: 4,500 to 6,695 feet
Slope: 1 to 8 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Aridic Lithic Argiustolls

Typical Profile

Typical pedon of Costavar gravelly sandy clay loam; in an area of Costavar and Volco soils, 1 to 8 percent slopes; Marfa, Texas USGS topographic quadrangle; Latitude: 30 degrees, 15 minutes, 14.07 seconds North; Longitude: 104 degrees, 4 minutes, 30.78 seconds West; NAD 83; UTM Easting: 588967 m, UTM Northing: 3347283 m, Zone 13.

A—0 to 4 inches; brown (10YR 4/3) gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine irregular pores; 20 percent indurated basalt gravel; neutral; clear smooth boundary.

Bt1—4 to 8 inches; brown (10YR 4/3) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; very fine and fine subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common very fine and fine roots; clay films; 40 percent indurated basalt gravel; neutral; gradual wavy boundary.

Bt2—8 to 13 inches; brown (10YR 4/3) extremely gravelly sandy clay loam, brown (10YR 4/3) moist; fine subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common fine roots; clay films; 70 percent indurated basalt gravel; neutral; abrupt wavy boundary.

R—13 to 23 inches; basalt bedrock.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: Sandy loam, loam, or sandy clay loam
Effervescence: None or slightly
Reaction: Neutral to moderately alkaline

Bt horizon

Hue: 5YR to 10YR
Value: 3 to 6 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Effervescence: None to strongly
Reaction: Neutral to moderately alkaline

R layer

Kind: Basalt bedrock
Cementation: Indurated

Coyanosa Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Hills
Parent material: Gravelly residuum weathered from sandstone
Elevation: 3,500 to 5,000 feet
Slope: 5 to 16 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, nonacid, thermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Coyanosa extremely gravelly fine sandy loam in an area of Buckear-Coyanosa complex, 5 to 15 percent slopes; Brewster County, Texas; Heart Mountain, Texas USGS topographic quadrangle; Latitude: 29 degrees, 55 minutes, 42.751 seconds, North; Longitude: 103 degrees, 9 minutes, 55.770 seconds West; NAD 83; UTM Easting: 677076 m, UTM Northing: 3312283 m, Zone 13.

A1—0 to 2 inches; brown (7.5YR 5/4) extremely gravelly fine sandy loam, brown (7.5YR 4/4) moist; weak medium granular structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and common fine roots; 60 percent sandstone gravel; neutral; abrupt smooth boundary.
A2—2 to 7 inches; brown (7.5YR 4/4) extremely gravelly fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine and common fine roots; 70 percent sandstone gravel; neutral; abrupt wavy boundary.
R—7 to 80 inches; strongly cemented fractured sandstone bedrock.

A horizon

Hue: 5YR to 10YR
Value: 3 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, or loam
Clay content: 15 to 25 percent; averages less than 18 percent clay
Rock fragments: 35 to 80 percent, size mostly 1/8 to 3 inches in diameter with 5 percent or less between 3 to 15 inches
Organic matter: Less than 1 percent
Reaction: Neutral to moderately alkaline

R layer

Kind: Fractured sandstone bedrock
Cementation: Strongly cemented

Decoty Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Dip slopes on cuestas
Parent material: Gravelly residuum weathered from rhyolite and/or ignimbrite
Elevation: 3,500 to 5,000 feet
Slope: 1 to 20 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplocalcids

Typical Profile

Typical pedon of Decoty very gravelly fine sandy loam in an area of Sauceda-Decoty complex, 1 to 20 percent slopes; Puerto Portillo, Texas USGS topographic quadrangle; Latitude: 29 degrees 49 minutes 18 seconds North; Longitude: 103 degrees 54 minutes 58 seconds West, NAD 83; UTM Easting: 604728 m, UTM Northing: 3299518 m, Zone 13.

A—0 to 5 inches; brown (7.5YR 5/3) very gravelly fine sandy loam, dark brown (7.5YR 3/3) moist; weak medium granular structure; slightly hard, friable; slightly sticky and slightly plastic; many fine and medium roots; common fine tubular pores; 45 percent ignimbrite gravel with thin coatings of carbonate; strongly effervescent; moderately alkaline; abrupt smooth boundary.

Bk—5 to 14 inches; pinkish gray (7.5YR 7/2) extremely cobbly fine sandy loam, brown (7.5YR 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable; slightly sticky and slightly plastic; common fine and medium roots; common fine and medium tubular pores; 50 percent ignimbrite cobbles, 20 percent ignimbrite gravel; rock fragments have thin coatings and pendants of carbonate; strongly effervescent; moderately alkaline; abrupt wavy boundary.

R—14 to 24 inches; gray (5YR 5/1) indurated ignimbrite bedrock; fractures are more than 4 inches apart; thin to medium carbonate coats on the upper surface of rock fragments and in seams.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 2 to 4 dry or moist
Texture: Fine sandy loam, sandy loam, or loam
Clay content: 8 to 18 percent
Rock fragments: 35 to 80 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline
Surface fragments: 60 to 95 percent

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 2 to 4 dry or moist
Texture: Fine sandy loam, sandy loam, or loam

Clay content: 8 to 18 percent
Rock fragments: 35 to 80 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

R layer

Kind: Ignimbrite bedrock
Cementation: Indurated

Eppenauer Series

Depth class: Moderately deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Fan piedmonts
Parent material: Loamy alluvium over tuffaceous sandstone
Elevation: 4,500 to 6,695 feet
Slope: 1 to 5 percent

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Aridic Argiustolls

Typical Profile

Typical pedon of Eppenauer fine sandy loam in an area of Espy-Eppenauer complex, 1 to 5 percent slopes; Marfa, Texas USGS topographic quadrangle; Latitude: 30 degrees, 18 minutes, 9.4 seconds North; Longitude: 104 degrees, 2 minutes, 51.2 seconds West; NAD 83; UTM Easting: 591583 m, UTM Northing: 3352702 m, Zone 13.

A—0 to 5 inches; brown (10YR 4/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure parting to weak fine granular; slightly hard, friable, nonsticky and nonplastic; many fine and medium roots; many fine and medium pores; 2 percent igneous gravel; noneffervescent; slightly alkaline; abrupt smooth boundary.

Bt—5 to 10 inches; brown (10YR 4/3) sandy clay loam, dark brown (10YR 3/3) moist; medium coarse prismatic structure parting to medium coarse subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine and medium roots; common fine and medium pores; common distinct clay films on faces of peds and lining pores; 2 percent igneous gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Btk—10 to 18 inches; brown (10YR 4/3) sandy clay loam, dark brown (10YR 3/3) moist; moderate coarse prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, slightly sticky and slightly plastic; few fine roots; common fine and medium pores; common distinct clay films on faces of peds and lining pores; 1 percent igneous gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk—18 to 23 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine roots; common fine and medium pores; 3 percent medium nodules of calcium carbonate; 1 percent igneous gravel; violently effervescent; moderately alkaline; abrupt wavy boundary.

Cr—23 to 40 inches; moderately cemented tuffaceous sandstone bedrock that has calcareous seams 4 to 12 inches apart that become thinner and farther apart with depth; noneffervescent; slightly alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 2.5 to 5 dry, 2 to 4 moist
Chroma: 2 or 3, dry or moist
Texture: Sandy loam or fine sandy loam
Effervescence: None or slightly
Reaction: Slightly alkaline or moderately alkaline

Bt horizon

Hue: 7.5YR or 10YR
Value: 3 to 7 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: Loam, clay loam, or sandy clay loam
Effervescence: None or slightly
Reaction: Slightly alkaline or moderately alkaline

Btk horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, sandy loam, or loam
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

CR layer

Texture: Tuffaceous sandstone
Cementation: Moderately cemented

Espy Series

Depth class: Shallow to petrocalcic horizon
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Fan piedmonts
Parent material: Gravelly alluvium derived from tuffaceous sandstone
Elevation: 4,500 to 6,695 feet
Slope: 1 to 5 percent

Taxonomic Class

Loamy, mixed, superactive, thermic, shallow Petrocalcic Calciustolls

Typical Profile

Typical pedon of Espy fine sandy loam in an area of Espy-Eppenauer complex, 1 to 5 percent slopes; Marfa, Texas USGS topographic quadrangle; Latitude: 30 degrees, 15 minutes, 53.736 seconds North; Longitude: 104 degrees, 2 minutes, 41.626 seconds West; NAD 83; UTM Easting: 591874 m, UTM Northing: 3348528 m, Zone 13.

A—0 to 4 inches; brown (10YR 4/3) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; friable, slightly hard, nonsticky, nonplastic; common very fine and common fine roots; 13 percent igneous gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk—4 to 16 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; friable, slightly hard, nonsticky, nonplastic; common very fine and common very coarse roots; 10 percent distinct carbonate coats on rock fragments; 15 percent fine faint irregular light gray (10YR 7/2) dry, carbonate, finely disseminated with diffuse boundaries; 5 percent igneous cobbles and 8 percent igneous gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bkkm—16 to 22 inches; very pale brown (10YR 8/2) cemented material, light gray (10YR 7/2) moist; violently effervescent; moderately alkaline; clear smooth boundary.

BCk—22 to 39 inches; light gray (10YR 7/2) fine sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; firm, very hard, nonsticky, nonplastic; 15 percent fine faint threadlike light brownish gray (10YR 6/2) moist, carbonate, finely disseminated with diffuse boundaries; 5 percent igneous cobbles and 8 percent igneous gravel; violently effervescent; moderately alkaline; abrupt wavy boundary.

2C—39 to 80 inches; light gray (10YR 7/2) loamy sand, brown (10YR 4/3) moist; massive; firm, hard, nonsticky, nonplastic; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, dry or moist
Chroma: 2 or 3, dry or moist
Texture: Fine sandy loam, loam, or clay loam
Rock fragments: None
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, loam, or clay loam
Rock fragments: None
Secondary carbonates: Few to many films and threads
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bkkm horizon

Cementation: Upper 1/4 to 2 inches is laminar and the lower part is indurated to moderately cemented
Effervescence: Strongly or violently
Reaction: Moderately alkaline

BCk horizon

Hue: 7.5YR or 10YR
Value: 6 to 8 dry, 4 or 5 moist
Chroma: 1 to 4, dry or moist
Texture: Loamy
Rock fragments: 15 to 60 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

2C horizon

Hue: 7.5YR or 10YR
Value: 6 to 8 dry, 4 or 5 moist
Chroma: 1 to 4, dry or moist
Texture: Sand and loamy sand
Rock fragments: 15 to 60 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Galindo Series

Depth class: Very deep
Drainage class: Moderately Well drained
Slowest soil permeability to 60 inches: Slow
Landforms: Flood plains
Parent material: Holocene age clayey alluvium
Elevation: 1,800 to 3,995 feet
Slope: 0 to 1 percent

Taxonomic Class

Clayey over loamy, smectitic over mixed, superactive, calcareous, hyperthermic Ustertic Torrifluvents

Typical Profile

Typical pedon of Galindo clay in an area of Galindo clay 0 to 1 percent slopes, occasionally flooded; Presidio West, Texas USGS topographic quadrangle: Latitude: 29 degrees, 35 minutes, 39.24 seconds North; Longitude: 104 degrees, 26 minutes, 5.10 seconds West; NAD 83; UTM Easting: 554738 m, UTM Northing: 3273958 m, Zone 13.

Ap—0 to 12 inches; brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; moderately hard, firm, very sticky and very plastic; very slightly saline; strongly effervescent; moderately alkaline; abrupt smooth boundary.

C1—12 to 29 inches; brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; massive; hard, firm, very sticky and very plastic; few fine and medium tubular roots; few fine tubular pores; non-saline; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2C2—29 to 48 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; few fine tubular pores; non-saline; strongly effervescent; moderately alkaline; gradual smooth boundary.

2C3—48 to 80 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grain; loose, loose, nonsticky and nonplastic, few fine tubular pores; strongly effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Clay loam, silty clay loam, silty clay, or clay
Clay content: 28 to 55 percent
Effervescence: Slightly or strongly
Reaction: Moderately alkaline

C horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 2 to 5, dry or moist
Texture: Clay loam, silty clay loam, silty clay, or clay
Clay content: 35 to 60 percent
Effervescence: Slightly or strongly
Reaction: Moderately alkaline

2C horizon

Hue: 7.5YR or 10YR
Value: 3 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Fine sand to silt loam and may be stratified
Clay content: 5 to 22 percent, with an absolute difference of 25 percent or more from the overlying C horizon
Effervescence: Slightly or strongly
Reaction: Moderately alkaline

Geefour Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Slow
Landforms: Hillslopes
Parent material: Gravelly colluvium over clayey residuum weathered from mudstone
Elevation: 1,800 to 3,995 feet
Slope: 5 to 45 percent

Taxonomic Class

Clayey, smectitic, calcareous, hyperthermic, shallow Ustic Torriorthents

Typical Profile

Typical pedon of Geefour very gravelly silty clay in an area of Geefour silty clays complex, 10 to 45 percent slopes; Tule Mountain, Texas USGS topographic quadrangle; Latitude: 29 degrees, 19 minutes, 57.459 seconds North; Longitude: 103 degrees, 48 minutes, 9.945 seconds West; NAD 83; UTM Easting: 616240 m, UTM Northing: 3245434 m, Zone 13.

A1—0 to 2 inches; light grayish brown (2.5Y 6/2) very gravelly silty clay, grayish brown (2.5Y 5/2) moist; moderate medium subangular blocky structure; very hard, very firm; very sticky, very plastic; very few very fine and fine roots; 45 percent indurated igneous gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

A2—2 to 7 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2), moist; strong fine subangular blocky structure; very hard, very firm, very sticky, very plastic; very few very fine and fine roots; violently effervescent; moderately alkaline; clear smooth boundary.

Cd—7 to 20 inches; light brownish gray (2.5Y 6/2) densic noncemented mudstone that has silty clay texture; massive; extremely hard, extremely firm, brittle; many dark reddish brown (2.5YR 3/4) stains on fracture surfaces; strongly effervescent; moderately alkaline.

A horizon

Hue: 10YR to 5Y
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 1 to 4, dry or moist
Texture: Silty clay loam, silty clay, or clay
Clay content: 35 to 50 percent
Rock fragments: 15 to 45 percent
Effervescence: Slightly to violently
Reaction: Moderately alkaline or strongly alkaline

BC or C horizon (where present)

Hue: 10YR to 5Y
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 1 to 4, dry or moist
Texture: Silty clay loam, silty clay, or clay
Clay content: 35 to 50 percent
Rock fragments: 0 to 15 percent
Effervescence: Slightly to violently
Reaction: Moderately alkaline or strongly alkaline

Cd layer

Kind: Mudstone bedrock, dense shale/mudstone that slakes in water
Cementation: Noncemented

Geefour Taxadjunct

Depth class: Shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Very slow
Landforms: Erosion remnants
Parent material: Gypsiferous clayey lacustrine deposits
Elevation: 1,800 to 3,995 feet
Slope: 5 to 45 percent

Taxonomic Class

Clayey, smectitic, hyperthermic, shallow Leptic Haplogypsids

The Geefour soils in map unit GMF—Geefour and Melado soils, 5 to 45 percent slopes, are a taxadjunct to the series because they have gypsum throughout the soil profile.

Typical Profile

Typical pedon of Geefour clay in an area of Geefour and Melado soils, 5 to 45 percent slopes; Presidio West, Texas USGS topographic quadrangle; Latitude: 29 degrees, 37 minutes, 12.57 seconds North; Longitude: 104 degrees, 25 minutes, 18.28 seconds West; NAD 83; UTM Easting: 555983 m, UTM Northing: 3276837 m, Zone 13.

Ay—0 to 5 inches; pale brown (10YR 6/3) clay, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; very firm, hard, very sticky and very plastic; few fine and medium roots; 1 percent gypsum crystals; strongly effervescent; moderately alkaline; clear smooth boundary.

Byz—5 to 18 inches; yellowish brown (10YR 5/4) clay, brown (7.5YR 5/4) moist; strong medium subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine roots; few pressure faces; 3 percent gypsum crystals; 1 percent salt crystals; strongly effervescent; strongly alkaline; clear smooth boundary.

Cdy—18 to 28 inches; yellowish brown (10YR 5/4) clay, brown (7.5YR 5/4) moist; massive; very hard, firm, very sticky and very plastic; few pressure faces; 1 percent masses of iron-manganese; 1 percent gypsum crystals; slightly effervescent; strongly alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 4 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Silty clay or clay
Clay content: 40 to 50 percent
Rock fragments: 0 to 35 percent
Calcium carbonate equivalent: 5 to 15 percent
Gypsum content: 0 to 2 percent
EC (dS/m): 8 to 20
SAR: 13 to 30
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Byz horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 4 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Silty clay or clay
Rock fragments: 0 to 40
Clay content: 40 to 55 percent
Calcium carbonate equivalent: 5 to 15 percent
Gypsum content: 2 to 20 percent
EC (dS/m): 8 to 20
SAR: 20 to 70
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

CB horizon (where present)

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 3 or 4, dry or moist
Texture: Silty clay or clay
Clay content: 40 to 55 percent
Rock fragments: 0 to 10 percent
Calcium carbonate equivalent: 5 to 15 percent
Gypsum content: 2 to 20 percent
EC (dS/m): 8 to 20
SAR: 10 to 70
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Cdy horizon

Hue: 7.5YR to 2.5Y
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 6, dry or moist
Texture: Silty clay or clay
Clay content: 50 to 72 percent
Iron-manganese concentrations: 1 to 3 percent
Rock fragments: 0 to 10 percent

Calcium carbonate equivalent: 10 to 20 percent
Gypsum content: 1 to 10 percent
EC (dS/m): 8 to 20
SAR: 10 to 70
Effervescence: Slightly to violently
Reaction: Moderately alkaline or strongly alkaline

Gemelo Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Fan aprons, inset fans, fan skirts
Parent material: Loamy alluvium derived from tuff
Elevation: 3,500 to 5,000 feet
Slope: 1 to 3 percent

Taxonomic Class

Coarse-loamy, mixed, superactive, thermic Sodic Ustic Haplocambids

Typical Profile

Typical pedon of Gemelo gravelly fine sandy loam in an area of Gemelo and Straddlebug soils, 1 to 3 percent slopes; Brewster County, Texas; Duff Springs, Texas USGS topographic quadrangle; Latitude: 29 degrees 58 minutes 24.00 seconds North; Longitude: 103 degrees 42 minutes 39.00 seconds West; NAD 83; UTM Easting: 624331 m, UTM Northing: 3316548 m, Zone 13.

A—0 to 6 inches; brown (10YR 5/3) gravelly fine sandy loam, brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure; thin platy structure in the upper 2 inches; very friable, soft, slightly sticky, slightly plastic; 18 percent tuff gravel; SAR of 3; strongly effervescent; moderately alkaline; clear smooth boundary.

Bn—6 to 14 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; 1 percent tuff gravel; SAR of 8; violently effervescent; moderately alkaline; clear smooth boundary.

Bkn1—14 to 25 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 5/3) moist; weak medium and coarse subangular blocky structure; very friable, soft, slightly sticky, slightly plastic; 1 percent distinct white (10YR 8/1) dry, carbonate coats on faces of peds and 80 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 1 percent fine irregular white (10YR 8/1) carbonate masses between peds; 54 percent tuff gravel; SAR of 8; violently effervescent; moderately alkaline; gradual smooth boundary.

Bkn2—25 to 36 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak medium and coarse subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; 25 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 1 percent tuff gravel; SAR of 12; violently effervescent; moderately alkaline; gradual smooth boundary.

Bkn3—36 to 54 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 5/3) moist; weak medium and coarse subangular blocky structure; very friable, soft, slightly sticky, slightly plastic; 1 percent distinct white (10YR 8/1) dry, carbonate coats on faces of peds and 75 percent continuous distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 1 percent fine irregular white (10YR 8/1) carbonate masses between peds; 45 percent tuff gravel; SAR of 40; violently effervescent; moderately alkaline; clear smooth boundary.

BCkn—54 to 80 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium and coarse subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; alternating strata of sandy loam and gravel 50 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 30 percent tuff gravel; SAR of 40; strongly effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam
Rock fragments: 15 to 25 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Bn horizon

Hue: 7.5YR or 10YR
Value: 4 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, very fine sandy loam, or loam
Rock fragments: 0 to 20 percent
SAR: 1 to 15
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Bkn horizon

Hue: 7.5YR or 10YR
Value: 5 through 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, or loam
Rock fragments: 1 to 60 percent
SAR: 5 to 50
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

BCkn and C horizons

Hue: 7.5YR or 10YR
Value: 4 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Fine sand, sandy loam, or fine sandy loam
Rock fragments: 20 to 35 percent
SAR: 13 to 50
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Holguin Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Hillslopes, dissected, pediments, dip slopes on cuestas
Parent material: Gravelly residuum and/or colluvium derived from tuff and/or conglomerate
Elevation: 3,500 to 5,000 feet
Slope: 1 to 20 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Holguin very gravelly sandy loam in an area of Scotal and Holguin soils, 1 to 8 percent slopes; Brewster County, Texas; Paradise Draw, Texas USGS topographic quadrangle; Latitude: 29 degrees, 58 minutes, 10.871 seconds North; Longitude: 103 degrees, 45 minutes, 22.635 seconds West; NAD 83; UTM Easting: 620001 m, UTM Northing: 3316071 m, Zone 13.

A—0 to 9 inches; brown (10YR 4/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; 15 percent subrounded coarse tuffaceous sandstone gravel and 30 percent fine and medium igneous gravel; strongly effervescent; moderately alkaline; abrupt smooth boundary.

BCk—9 to 19 inches; brown (7.5YR 5/3) extremely channery sandy loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure parting to weak fine and medium granular; friable, slightly hard, slightly sticky, slightly plastic; common fine and medium, and few coarse roots; 80 percent subangular tuffaceous sandstone channers; violently effervescent; moderately alkaline; abrupt smooth boundary.

R—19 to 23 inches; indurated tuff bedrock; violently effervescent.

A horizon

Hue: 5YR to 10YR
Value: 3 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, or loam
Rock fragments: 35 to 80 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

BCk horizon

Hue: 5YR to 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, loam, sandy clay loam, or clay loam
Clay content: Averages less than 18 percent clay
Rock fragments: 35 to 80 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

R layer

Kind: Unweathered conglomerate basalt or tuff bedrock
Cementation: Indurated

Horsetrap Series

Depth class: Shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Mountains, hills
Parent material: Gravelly slope alluvium and/or residuum weathered from basalt
Elevation: 3,500 to 5,000 feet
Slope: 1 to 30 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplocalcids

Typical Profile

Typical pedon of Horsetrap gravelly sandy clay loam in an area of Horsetrap-Bofecillos-Rock outcrop complex, 1 to 12 percent slopes; Sauceda Ranch, Texas USGS topographic quadrangle; Latitude of 29 degrees, 27 minutes, 27.36 seconds North, Longitude of 103 degrees, 54 minutes, 25.31 seconds West; NAD 83; UTM Easting: 605986 m, UTM Northing: 3259183 m, Zone 13.

A—0 to 4 inches; grayish brown (10YR 5/2) gravelly sandy clay loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to weak fine granular; very friable, slightly hard; common very fine roots; 25 percent basalt gravel; noneffervescent; slightly alkaline; abrupt smooth boundary.

Bk1—4 to 8 inches; grayish brown (10YR 5/2) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; very friable, slightly hard; common fine roots; 5 percent fine irregular carbonate masses; thin coatings and pendants of carbonate on rock fragments; 35 percent fine basalt gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk2—8 to 13 inches; grayish brown (10YR 5/2) very gravelly sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; very friable, slightly hard; common fine roots; 5 percent fine irregular carbonate masses; 15 percent thin coatings and pendants of carbonate on rock fragments; 35 percent fine basalt gravel; strongly effervescent; moderately alkaline; abrupt smooth boundary.

R—13 to 23 inches; very dark grayish brown (10YR 3/2) indurated basalt bedrock, very dark brown (10YR 2/2) moist; 50 percent carbonate coats on surface of bedrock; strongly effervescent.

A horizon

Hue: 7.5YR to 2.5Y
Value: 3 to 7 dry, 2 to 6 moist
Chroma: 2 to 4 dry, 2 or 3 moist
Texture: Sandy loam, loam, sandy clay loam, or clay loam
Clay content: 12 to 30 percent
Rock fragments: 20 to 50 percent
Calcium carbonate equivalent: 0 to 5 percent
Effervescence: None to slightly
Reaction: Neutral to slightly alkaline

Bk horizon

Hue: 7.5YR to 2.5Y
Value: 3 to 7 dry, 3 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Clay content: 15 to 30 percent
Rock fragments: 35 to 60 percent; gravels and/or cobbles
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Strongly or violently
Reaction: Slightly to moderately alkaline

R layer

Hue: 10YR or 2.5Y
Value: 3 to 7 dry, 2 to 6 moist
Chroma: 1 to 3, dry or moist

Kind: Basalt bedrock
Cementation: Indurated

Kinco Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Alluvial flats, drainageways
Parent material: Loamy alluvium derived from igneous and sedimentary rock
Elevation: 3,500 to 5,000 feet
Slope: 0 to 3 percent

Taxonomic Class

Coarse-loamy, mixed, superactive, thermic Ustic Haplocalcids

Typical Profile

Typical pedon of Kinco gravelly sandy loam in an area of Kinco gravelly sandy loam, 0 to 3 percent slopes; Puerto Potrillo, Texas USGS topographic quadrangle Latitude: 29 degrees, 46 minutes, 16.844 seconds North; Longitude: 104 degrees, 0 minutes, 0.131 seconds West; NAD 83; UTM Easting: 596667 m, UTM Northing: 3293868 m, Zone 13.

A—0 to 4 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; friable, slightly hard; 25 percent subrounded gravel; strongly effervescent; moderately alkaline; abrupt smooth boundary.

Bw—4 to 16 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; friable, slightly hard; 12 percent patchy distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 10 percent subrounded gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk1—16 to 26 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; friable, slightly hard; 3 percent discontinuous distinct white (10YR 8/1) dry, carbonate coats on all faces of peds and 40 percent patchy distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 3 percent fine threadlike weakly cemented white (10YR 8/1) dry, carbonate masses throughout; 25 percent subangular rhyolite gravel; violently effervescent; moderately alkaline; clear wavy boundary.

Bk2—26 to 46 inches; very pale brown (10YR 7/4) gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; 40 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 11 percent angular rhyolite gravels and 11 percent subrounded rhyolite gravel; violently effervescent; moderately alkaline; clear wavy boundary.

BCk—46 to 80 inches; very pale brown (10YR 7/4) gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 15 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 5 percent angular rhyolite gravels and 6 percent subrounded rhyolite gravel; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: Loamy fine sand, sandy loam, or fine sandy loam
Effervescence: Slightly to violently
Reaction: Moderately alkaline

Bw horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 3 to 6 moist
Chroma: 3 to 4, dry or moist
Texture: Fine sandy loam, sandy loam, or loam
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bk and BCk horizons

Hue: 7.5YR or 10YR
Value: 5 to 8 dry, 4 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, sandy loam, or loam
Calcium carbonate equivalent: 15 to 35 percent
BCk features: Has fewer carbonates
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Lingua Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Escarpments, mountain slopes, hills, hillslopes
Parent material: Gravelly residuum and/or colluvium derived from basalt
Elevation: 3,500 to 5,000 feet
Slope: 1 to 45 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, nonacid, thermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Lingua very gravelly loam in an area of Lingua-Ohtwo complex, 20 to 45 percent slopes; Brewster County, Texas; Duff Springs, Texas USGS topographic quadrangle; Latitude; 29 degrees, 55 minutes, 14.00 seconds, North; Longitude: 103 degrees, 41 minutes, 50.00 seconds West; NAD 83; UTM Easting: 625770 m, UTM Northing: 3310711 m, Zone 13.

A—0 to 8 inches; brown (7.5YR 4/3) very gravelly loam, dark brown (7.5YR 3/3) moist; moderate fine and medium subangular blocky structure parting to moderate fine granular; friable, slightly hard; many very fine and fine roots; 50 percent basalt gravel; noneffervescent; slightly alkaline; abrupt smooth boundary.

R—8 to 18 inches; gray (10YR 5/1) unweathered basalt bedrock, dark grayish brown (10YR 4/2) moist; indurated.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Rock fragments: 35 to 80 percent
Effervescence: None or slightly effervescent
Reaction: Neutral to moderately alkaline

R layer

Kind: Unweathered igneous bedrock
Fractures: Greater than 4 inches apart
Calcium carbonate coatings: Present in vertical fractures of some pedons

Lomapelona Series

Depth class: Very deep
Drainage class: Moderately well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Flood plains
Parent material: Loamy alluvium derived from igneous and sedimentary rock
Elevation: 1,800 to 3,995 feet
Slope: 0 to 1 percent

Taxonomic Class

Coarse-loamy, mixed, superactive, calcareous, hyperthermic Ustic Torrifluvents

Typical Profile

Typical pedon of Lomapelona loam in an area of Vicente, Lomapelona, and Castolon soils, 0 to 1 percent slopes, occasionally flooded; Redford, Texas USGS topographic quadrangle; Latitude: 29 degrees, 27 minutes, 20.96 seconds North; Longitude: 104 degrees, 12 minutes, 20.49 seconds West; NAD 83; UTM Easting: 577025 m, UTM Northing: 3258751 m, Zone 13.

Ap—0 to 6 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; violently effervescent; moderately alkaline; abrupt smooth boundary.

C1—6 to 11 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; massive; very friable, slightly hard, slightly sticky, slightly plastic; violently effervescent; moderately alkaline; gradual smooth boundary.

C2—11 to 25 inches; brown (10YR 5/3) very fine sandy loam, brown (10YR 4/3 moist; massive; very friable, slightly hard, slightly sticky, nonplastic; violently effervescent; moderately alkaline; gradual smooth boundary.

C3—25 to 39 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; massive; very friable, slightly hard, nonsticky, nonplastic; violently effervescent; moderately alkaline; gradual smooth boundary.

C4—39 to 80 inches; very pale brown (10YR 7/3) fine sandy loam, pale brown (10YR 6/3) moist; massive; very friable, slightly hard, nonsticky, nonplastic; violently effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 3 to 6 dry, 3 or 4 moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, very fine sandy loam, silt loam, loam, sandy clay loam, silty clay loam, clay loam, or clay
Clay content: 5 to 45 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline to strongly alkaline

C horizon

Hue: 10YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma 2 to 5, dry or moist

Texture: Fine sand, loamy fine sand, loamy very fine sand, very fine sandy loam, fine sandy loam, sandy loam, loam, silt, silt loam, silty clay loam, sandy clay loam, clay loam, or clay
Clay content: 2 to 45 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline to strongly alkaline

Manzanillo Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Fan remnants
Parent material: Gravelly alluvium and/or residuum weathered from fanglomerate
Elevation: 3,500 to 5,000 feet
Slope: 1 to 30 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Calcic Lithic Petrocalcids

Typical Profile

Typical pedon of Manzanillo gravelly sandy loam in an area of Manzanillo and Paisano soils, 1 to 30 percent slopes; Casa Piedra, Texas USGS topographic quadrangle; Latitude: 29 degrees, 41 minutes, 37.04 seconds North; Longitude: 104 degrees, 4 minutes, 48.08 seconds West; NAD 83; UTM Easting: 589003 m, UTM Northing: 3285191 m, Zone 13.

A—0 to 2 inches; brown (10YR 5/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; weak medium platy and weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; 30 percent igneous gravels and 10 percent igneous cobbles; strongly effervescent; slightly alkaline; abrupt smooth boundary.
Bk—2 to 13 inches; brown (10YR 4/3) extremely gravelly sandy clay loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; 4 percent distinct carbonate coats on rock fragments; 45 percent ligneous gravels, and 20 percent igneous gravels; violently effervescent; slightly alkaline; very abrupt wavy boundary.
Bkkm—13 to 16 inches; white (10YR 8/1) moderately cemented petrocalcic, light gray (10YR 7/1) moist; massive; moderately cemented by carbonates; high excavation difficulty; violently effervescent; moderately alkaline; very abrupt wavy boundary.
R—16 to 22 inches; pale brown (10YR 6/3) strongly cemented fanglomerate bedrock, brown (10YR 5/3) moist; very high excavation difficulty; strongly effervescent; slightly alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 or 3, dry or moist
Texture: Sandy loam, fine sandy loam, loam, or sandy clay loam
Rock fragments: Less than 35 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 8 dry, 3 to 7 moist

Chroma: 2 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, loam, or sandy clay loam
Rock fragments: 35 percent or more
Calcium carbonate equivalent: 10 to 25 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bkkm horizon

Hue: 7.5YR or 10YR
Value: 7 to 8 dry, 6 to 7 moist
Chroma: 1 to 3, dry or moist
Cementation: Weakly to strongly
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

R layer

Kind: Fanglomerate bedrock

Marfa Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Flood plains
Parent material: Loamy and clayey alluvium derived from igneous and sedimentary rock
Elevation: 4,500 to 6,695 feet
Slope: 0 to 2 percent

Taxonomic Class

Fine, mixed, superactive, thermic Pachic Argiustolls

Typical Profile

Typical pedon of Marfa clay loam in an area of Marfa clay loam, 0 to 2 percent slopes, occasionally flooded; Marfa, Texas USGS topographic quadrangle; Latitude: 30 degrees, 19 minutes, 09.4 seconds North; Longitude: 104 degrees, 01 minutes, 46.4 seconds West; NAD 83; UTM Easting: 593298 m, UTM Northing: 3354564 m, Zone 13.

A—0 to 4 inches; dark grayish brown (10YR 4/2) clay loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, friable; moderately sticky and moderately plastic; many fine and medium roots; slightly acid; clear smooth boundary.

Bt1—4 to 13 inches; dark grayish brown (10YR 4/2) clay loam, very dark brown (10YR 2/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; moderately sticky and moderately plastic; many very fine and fine roots; 25 percent distinct clay films on faces of peds; neutral; gradual smooth boundary.

Bt2—13 to 24 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard and very firm; very sticky and very plastic; common very fine and fine roots; 20 percent distinct clay films on faces of peds; neutral; gradual smooth boundary.

Bt3—24 to 41 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm, very sticky, and very plastic; few fine and very fine roots; 10 percent

distinct clay films on faces of peds; noneffervescent; slightly alkaline; gradual wavy boundary.

2Btk1—41 to 55 inches; light brown (7.5YR 6/4 loam, brown (7.5YR 5/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; few very fine and fine roots; 5 percent distinct clay films on faces of peds; few fine lime threads and fine lime masses; slightly effervescent; moderately alkaline; gradual wavy boundary.

2Btk2—55 to 69 inches; light brown (7.5YR 6/3) fine sandy loam, brown (7.5YR 5/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, firm, sticky and plastic; 5 percent faint clay films on faces of peds; few fine lime threads and fine and medium lime masses; strongly effervescent; moderately alkaline; gradual wavy boundary

2BCk—69 to 80 inches; light brown (7.5YR 6/4) loamy fine sand, brown (7.5YR 5/4) moist; weak medium and coarse subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common fine and medium lime masses; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 1 to 3 dry or moist
Texture: Clay loam
Reaction: Slightly acid to neutral

Bt horizon

Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: Clay loam or clay
Clay content: 35 to 50 percent
Effervescence: None or slight
Reaction: Neutral to slightly alkaline

2Btk horizon

Hue: 7.5YR or 10YR
Value: 5 to 7, dry or moist
Chroma: 3 or 4, dry or moist
Texture: Sandy clay loam, clay loam, loam, or fine sandy loam
Rock fragments: Less than 5 percent
Calcium carbonate equivalent: 5 to 10 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

2Bk horizon (where present)

Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: Loam, sandy clay loam, clay loam, or sandy loam
Clay content: 10 to 35 percent
Rock fragments: Less than 10 percent
Calcium carbonates equivalent: 5 to 15 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline to strongly alkaline

2BCk horizons

Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 or 5 moist
Chroma: 3 or 4 dry or moist
Texture: Fine sandy loam, loamy fine sand, or loam
Clay content: 2 to 20 percent
Rock fragments: 5 to 10 percent
Calcium carbonates equivalent: 5 to 15 percent
Reaction: Slightly or moderately alkaline

Mariscal Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Hills, erosion remnants
Parent material: Channery residuum and/or colluvium derived from limestone
Elevation: 1,800 to 3,995 feet
Slope: 10 to 30 percent

Taxonomic Class

Loamy-skeletal, carbonatic, hyperthermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Mariscal extremely channery loam (fig. 63) in an area of Mariscal-Rock outcrop complex, 10 to 30 percent slopes; Brewster County, Texas; Boquillas, Texas USGS topographic quadrangle; Latitude: 29 degrees, 11 minutes, 13.60 seconds North; Longitude: 102 degrees, 59 minutes, 59.90 seconds West; NAD 83; UTM Easting: 694458 m, UTM Northing: 3230311 m, Zone 13.

A—0 to 2 inches; pale brown (10YR 6/3) extremely channery loam, brown (10YR 5/3) moist; moderate medium granular structure; very friable, slightly hard, slightly sticky, slightly plastic; 5 percent flagstones and 55 percent channers; violently effervescent; moderately alkaline; abrupt smooth boundary.

Ak—2 to 5 inches; pale brown (10YR 6/3) extremely channery loam, brown (10YR 5/3) moist; moderate medium granular structure; very friable, slightly hard, slightly sticky, slightly plastic; 20 percent carbonate coats on rock fragments; 5 percent flagstones and 55 percent channers; violently effervescent; moderately alkaline; abrupt smooth boundary.

Rk—5 to 10 inches; very strongly cemented limestone bedrock; very strongly cemented carbonate coats on bedrock; 1 percent fine platy carbonate masses in cracks; strongly effervescent; moderately alkaline; gradual smooth boundary.

R—10 to 15 inches; very strongly cemented limestone bedrock; strongly effervescent.

A horizon (Bk and BCk horizons, where present)

Hue: 10YR
Value: 5 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, loam, or silt loam
Clay content: 10 to 30 percent
Rock fragments: 35 to 85 percent channers or flagstones

Figure 63.—Profile of Mariscal very channery loam, in an area of Mariscal-Rock outcrop complex, 5 to 30 percent slopes. Note the varying thickness of the fractured limestone bedrock and interbedded marl. (Scale in CM-centimeters, FT-feet)

Calcium carbonate coats: On rock fragments, as faint films to pendants up to 2 inches thick
Effervescence: Strongly or violently
Reaction: Moderately alkaline

R layer

Kind: Fractured limestone bedrock that contains from 10 to 50 percent interbedded chalky, or marly materials 0.25 to 10 inches thick

Martillo Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Slow
Landforms: Alluvial flats
Parent material: Clayey alluvium derived from tuff
Elevation: 3,500 to 5,000 feet
Slope: 0 to 3 percent

Taxonomic Class

Fine, mixed, superactive, thermic Sodic Ustic Haplocambids

Typical Profile

Typical pedon of Martillo clay loam in an area of Martillo and Butcherknife soils, 0 to 3 percent slopes, in rangeland; McKinney Mountain, Texas USGS topographic quadrangle; Latitude: 29 degrees, 48 minutes, 4.865 seconds North Longitude: 103 degrees, 49 minutes, 3.558 seconds West; NAD 83; UTM Easting: 614265 m, UTM Northing: 3297360 m, Zone 13.

A—0 to 4 inches; light brown (7.5YR 6/3) clay loam, brown (7.5YR 4/3) moist; weak medium granular structure; friable, hard, moderately sticky, moderately plastic; many fine and many medium roots; 2 percent tuff gravel; slightly effervescent; moderately alkaline; abrupt smooth boundary.

Bn1—4 to 12 inches; brown (7.5YR 5/3) clay, dark brown (7.5YR 3/3) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm, very hard, very sticky, very plastic; many fine and many medium roots; 2 percent tuff gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.

Bn2—12 to 17 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 3/3) moist; weak medium subangular blocky structure; firm, very hard, very sticky, very plastic; common fine and common medium roots; 5 percent tuff gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

Bn3—17 to 23 inches; light brown (7.5YR 6/4) clay, brown (7.5YR 5/4) moist; moderate fine and medium subangular blocky structure; firm, very hard, very sticky, very plastic; common fine tubular pores; 10 percent tuff gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

2Bnz—23 to 34 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; firm, very hard, moderately sticky, moderately plastic; common very fine tubular pores; 5 percent carbonate masses; 10 percent tuff gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2Bknz1—34 to 44 inches; brown (7.5YR 5/4) loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; firm, very hard, moderately sticky, moderately plastic; common very fine tubular pores; 5 percent carbonate masses; 12 percent tuff gravel; violently effervescent; moderately alkaline; gradual wavy boundary.

2Bknz2—44 to 55 inches; brown (7.5YR 5/4) loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; firm, very hard, moderately sticky, moderately plastic; common very fine tubular pores; 5 percent carbonate masses; 10 percent tuff gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2B'n1—55 to 64 inches; brown (7.5YR 5/4) loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; firm, very hard, moderately sticky, moderately plastic; common very fine tubular pores; 2 percent carbonate masses; 1 percent tuff cobbles and 5 percent tuff gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

3B'n2—64 to 72 inches; reddish brown (2.5YR 5/4) clay loam, reddish brown (2.5YR 4/4) moist; weak fine subangular blocky structure; firm, very hard, moderately sticky, moderately plastic; 5 percent carbonate masses; a pebble band composed of coarse subrounded igneous gravel occurs at base of horizon; strongly effervescent; moderately alkaline; clear wavy boundary.

3CBkn—72 to 80 inches; light reddish brown (5YR 6/4) silty clay loam, reddish brown (5YR 5/4) moist; weak fine subangular blocky structure; firm, very hard, moderately sticky, moderately plastic; many fine roots and many medium roots; 8 percent carbonate masses; strongly effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam or clay loam
Effervescence: Slight
Reaction: Moderately alkaline

Bn horizon

Hue: 5YR or 7.5YR
Value: 3 to 6, dry or moist

Chroma: 2 to 4, dry or moist
Texture: Clay
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

2Bn or 3Bn horizons

Hue: 2.5YR to 7.5YR
Value: 5 to 7, dry or moist
Chroma: 3 to 4, dry or moist
Texture: Loam, sandy clay loam, silty clay loam, or clay loam
Rock fragments: 0 to 15 percent
EC (dS/m): 4 to 16
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

CB or BC horizons

Similar to 2Bn or 3Bn horizons

Medley Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Alluvial fans, drainageways
Parent material: Loamy fan alluvium derived from igneous rock
Elevation: 4,500 to 6,695 feet
Slope: 1 to 5 percent

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Pachic Haplustolls

Typical Profile

Typical pedon of Medley gravelly loam in an area of Sanmoss-Medley complex, 1 to 5 percent slopes; Mitre Peak, Texas USGS topographic quadrangle; Latitude: 30 degrees, 22 minutes, 37.29 seconds North; Longitude: 103 degrees 45 minutes 35.74 seconds West; NAD 83; UTM Easting: 619152 m, UTM Northing: 3361216 m, Zone 13.

A1—0 to 2 inches; brown (7.5YR 4/2) gravelly loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; common very fine and common fine roots; 20 percent igneous gravel; neutral; clear smooth boundary.
A2—2 to 11 inches; brown (7.5YR 4/2) gravelly loam, dark brown (7.5YR 3/2) moist; moderate fine and medium granular structure; common very fine and common fine roots; 20 percent igneous gravel; neutral; clear smooth boundary.
A3—11 to 25 inches; brown (7.5YR 4/2) gravelly sandy loam, dark brown (7.5YR 3/2) moist; moderate fine and medium granular structure; common very fine and common fine roots; 25 percent igneous gravel; neutral; clear wavy boundary.
Bk—25 to 80 inches; brown (7.5YR 5/4) gravelly clay loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; common very fine and common fine roots; 1 percent carbonate coats on all faces of peds; 1 percent fine threadlike carbonate masses; 30 percent igneous gravel; strongly effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, dry or moist
Chroma: 2 or 3, dry or moist

Texture: Sandy loam, loam, sandy clay loam, or clay loam
Rock fragments: Mainly less than 3 inches in size and range from a few to about 30 percent by volume
Reaction: Neutral to moderately alkaline

Bk horizon

Hue: 5YR to 10YR
Value: 3 to 7, dry or moist
Chroma: 3 or 4, dry or moist
Texture: Sandy loam, loam, sandy clay loam, or clay loam
Rock fragments: Mainly less than 3 inches in size and range from a few to about 30 percent by volume
Secondary calcium carbonate: Few to many films, threads, and masses
Calcium carbonate equivalent: 2 to 15 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Melado Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Very slow
Landforms: Alluvial flats and footslopes of erosional remnants of bolsons
Parent material: Gypsiferous clayey lacustrine deposits
Elevation: 1,800 to 3,995 feet
Slope: 1 to 12 percent

Taxonomic Class

Fine, smectitic, hyperthermic Sodic Ustic Haplocambids

Typical Profile

Typical pedon of Melado silty clay in an area of Melado and Pantera soils, 1 to 5 percent slopes; Arroyo Melado, Texas USGS topographic quadrangle; Latitude: 29 degrees, 40 minutes, 19.19 seconds North; Longitude: 104 degrees, 28 minutes, 49.27 seconds West; NAD 83; UTM Easting: 550283 m, UTM Northing: 3282554 m, Zone 13.

An—0 to 4 inches; yellowish brown (10YR 5/4) silty clay, brown (10YR 5/3) moist; weak medium platy structure parting to weak medium subangular blocky; hard, very firm, very sticky and very plastic; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bnyz1—4 to 10 inches; brown (10YR 5/3) silty clay, brown (10YR 4/3) moist; weak medium platy and weak coarse prismatic structure parting to weak fine and medium subangular blocky; hard, very firm, very sticky and very plastic; 1 percent gypsum crystals; 1 percent fine threadlike white (10YR 8/1) salt masses; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bnyz2—10 to 22 inches; brown (10YR 5/3) silty clay, brown (10YR 4/3) moist; weak coarse prismatic structure parting to weak fine subangular blocky; hard, very firm, very sticky, and very plastic; 6 percent gypsum crystals; 5 percent fine threadlike white (10YR 8/1) salt masses; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bnyz3—22 or 35 inches; brown (10YR 5/3) silty clay, brown (10YR 4/3) moist; weak coarse prismatic structure parting to weak coarse and medium subangular blocky; hard, very firm, very sticky, and very plastic; 5 percent gypsum crystals; 2 percent fine threadlike white (10YR 8/1) salt masses; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bnyz4—35 to 44 inches; brown (10YR 5/3) silty clay, brown (10YR 4/3) moist; weak coarse prismatic structure parting to weak medium subangular blocky; hard, very firm; very sticky, and very plastic; 4 percent gypsum crystals; 3 percent fine threadlike white (10YR 8/1) salt crystals; strongly effervescent; moderately alkaline; gradual smooth boundary.

BCnyz—44 to 61 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; hard, firm, moderately sticky, and moderately plastic; 3 percent gypsum crystals; 2 percent fine threadlike white (10YR 8/1) salt masses; common thin bedding planes; strongly effervescent; strongly alkaline; clear wavy boundary.

Cnyz—61 to 80 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, very firm, very sticky, and very plastic; 5 percent fine irregular white (10YR 8/1) gypsum masses; 1 percent fine irregular white (10YR 8/1) gypsum crystals; common thin bedding planes; strongly effervescent; strongly alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 4 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Silt loam, silty clay loam, silty clay, or clay
Clay content: 25 to 45 percent
Rock fragments: 0 to 5 percent
Visible gypsum: 0 to 5 percent
Salt accumulations: 0 to 1 percent
EC (dS/m): 0 to 25
SAR: 0 to 13
Effervescence: Slightly to violently
Reaction: Moderately alkaline

Bnyz horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 4 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Silty clay loam, silty clay, or clay
Clay content: 35 to 50 percent
Rock fragments: 0 to 5 percent
Visible gypsum: 0 to 5 percent
Salt accumulations: 1 to 5 percent
EC (dS/m): 4 to 26
SAR: 13 to 30
Effervescence: Slightly to violently
Reaction: Moderately alkaline

BCn or CBn horizon (where present)

Hue: 7.5YR or 10YR
Value: 5 to 6 dry, 4 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Clay loam, silty clay, or clay
Clay content: 35 to 40 percent
Rock fragments: 0 to 5 percent
Visible gypsum: 1 to 18 percent
Salt accumulations: 1 to 5 percent
EC (dS/m): 8 to 20

SAR: 13 or 40
Effervescence: Slightly to strongly
Reaction: Moderately alkaline or strongly alkaline

Cnyz or 2Cny horizons

Hue: 7.5YR or 10YR
Value: 5 to 6 dry, 4 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Clay loam, silty clay, or clay
Clay content: 30 to 45 percent
Rock fragments: 0 to 33 percent
Visible gypsum: 1 to 5 percent
Salt accumulations: 0 to 2 percent
EC (dS/m): 8 to 20
SAR: 13 to 60
Effervescence: Slightly to strongly
Reaction: Moderately alkaline or strongly alkaline

Murray Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Fan piedmonts
Parent material: Loamy alluvium derived from igneous rock
Elevation: 4,500 to 6,695 feet
Slope: 1 to 5 percent

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Aridic Calciustolls

Typical Profile

Typical pedon of Murray fine sandy loam in an area of Murray, Marfa, and Boracho soils, 1 to 5 percent slopes; Nopal, Texas USGS topographic quadrangle; Latitude: 30 degrees, 15 minutes, 44.699 seconds North; Longitude: 103 degrees, 55 minutes, 49.287 seconds West; NAD 83; UTM Easting: 602895 m, UTM Northing: 3348348 m, Zone 13.

A—0 to 9 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky, slightly plastic; common fine roots; 1 percent igneous gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk1—9 to 26 inches; light brown (7.5YR 6/3) loam, brown (7.5YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky, moderately plastic; 4 percent clay films on rock fragments; 3 percent igneous gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Bk2—26 to 47 inches; pink (7.5YR 7/3) sandy clay loam, brown (7.5YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, firm, moderately sticky, moderately plastic; few fine roots; 10 percent igneous gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Bk3—47 to 80 inches; pink (7.5YR 7/3), sandy loam, brown (7.5YR 5/3), moist; weak fine subangular blocky structure; soft, very friable; nonsticky, nonplastic; 5 percent igneous gravel; strongly effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR

Value: 2 to 5, dry or moist
Chroma: 2 or 3, dry or moist
Texture: Fine sandy loam, loam, or silt loam
Effervescence: Slightly or strongly
Reaction: Moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 3 to 8, dry or moist
Chroma: 3 to 6, dry or moist
Texture: Sandy loam, loam, sandy clay loam, or clay loam
Clay content: 18 to 35 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

2B horizon (where present)

Hue: 7.5YR or 10YR
Value: 3 to 8, dry or moist
Chroma: 4 to 6, dry or moist
Texture: Silt loam, loam, or sandy clay loam
Clay content: 12 or 35 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Musgrave Taxadjunct

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Slow
Landforms: Pediments
Parent material: Residuum weathered from tuff
Elevation: 3,500 to 5,000 feet
Slope: 10 to 30 percent

Taxonomic Class

Clayey, mixed, superactive, calcareous, thermic, shallow Ustic Torriorthents

The Musgrave soils in map unit PIB—Paisano-Musgrave association, 1 to 5 percent slopes, and QBE—Quadria, Nolam, and Musgrave soils, 0 to 30 percent slopes, are a taxadjunct to the series because the soil temperature regime is thermic instead of hyperthermic.

Typical Profile

Typical pedon of Musgrave clay loam in an area of Quadria, Nolam, and Musgrave soils, 0 to 30 percent slopes; Brewster County, Texas; Straddlebug Mountain, Texas USGS topographic quadrangle; Latitude: 29 degrees 45 minutes 52.00 seconds North; Longitude: 103 degrees 42 minutes 29.00 seconds West; NAD 83; UTM Easting: 624920 m, UTM Northing: 3293392 m, Zone 13.

A—0 to 5 inches; light brownish gray (10YR 6/2) clay loam, grayish brown (10YR 5/2) moist; moderate fine and medium subangular blocky structure; firm, hard, moderately sticky, moderately plastic; common very fine and common fine roots; violently effervescent; moderately alkaline; clear smooth boundary.

Ck—5 to 18 inches; grayish brown (10YR 5/2) clay loam, grayish brown (10YR 5/2) moist; massive; firm, hard, moderately sticky, moderately plastic; 2 percent coarse irregular white (10YR 8/1) lime masses in cracks; 75 percent noncemented tuff

fragments, gravel size, that slake in water; noneffervescent; moderately alkaline; clear smooth boundary.

Cdk—18 to 80 inches; light brownish gray (2.5Y 6/2) noncemented tuff bedrock, fractured at intervals of 4 inches, grayish brown (2.5Y 5/2) moist; 1 percent prominent olive yellow (2.5Y 6/8) dry, iron stains on rock fragments; 2 percent coarse irregular extremely weakly cemented white (10YR 8/1) lime masses in cracks; noneffervescent; moderately alkaline.

A horizon

Hue: 7.5YR to 2.5Y
Value: 5 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Silty clay loam, silty clay, clay loam, or clay
Clay content: 35 to 50 percent
Rock fragments: 0 to 15 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

C horizon

Hue: 5YR to 2.5Y
Value: 5 to 7, dry or moist
Chroma: 1 to 3, dry or moist
Texture: Silty clay loam, silty clay, clay loam, or clay
Clay content: 35 to 55 percent
Pararock fragments: 5 to 75 percent noncemented tuff fragments that slake in water, gravel size
Calcium carbonate equivalent: Less than 15 percent
Gypsum crystals: Occur in some pedons
Effervescence: None to slightly
Reaction: Moderately alkaline or strongly alkaline

Cdk horizon

Kind: Noncemented tuff bedrock that has silty clay loam, silty clay, clay loam or clay texture
Gypsum crystals: Occur in cracks in some pedons
Effervescence: None to slightly
Reaction: Moderately alkaline or strongly alkaline

Musquiz Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Slow
Landforms: Fan skirts on fan piedmonts
Parent material: Loamy alluvium derived from igneous rock
Elevation: 4,500 to 6,695 feet
Slope: 0 to 5 percent

Taxonomic Class

Fine, mixed, superactive, thermic Calcidic Argiustolls

Typical Profile

Typical pedon of Musquiz clay loam in an area of Musquiz clay loam, 0 to 3 percent slopes; Brewster County, Texas; Alpine North, Texas USGS topographic quadrangle; Latitude: 30 degrees, 27 minutes, 48.813 seconds North; Longitude: 103 degrees, 41

minutes, 54.953 seconds, West; NAD 83; UTM Easting: 624935 m, UTM Northing: 3370873 m, Zone 13.

A—0 to 7 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; many very fine and many fine roots; 2 percent fine and medium igneous gravel; noneffervescent; slightly alkaline; clear smooth boundary.

Bt1—7 to 23 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist; moderate medium angular blocky structure; firm, hard, very sticky, very plastic; common very fine and common fine roots; 10 percent distinct clay films on all faces of peds and 3 percent distinct clay films on surfaces along pores; 3 percent fine and medium igneous gravel; neutral; clear smooth boundary.

Bt2—23 to 35 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate medium angular blocky structure; firm, hard, very sticky, very plastic; common very fine and common fine roots; 15 percent distinct clay films on all faces of peds and 7 percent distinct clay films on surfaces along pores; 8 percent fine and medium igneous gravel; neutral; clear wavy boundary.

Bk—35 to 80 inches; yellowish red (5YR 5/6) clay loam, yellowish red (5YR 4/6) moist; single grain; firm, hard, moderately sticky, moderately plastic; common very fine and common fine roots; 1 percent fine irregular carbonate masses and 5 percent medium irregular carbonate masses; 13 percent igneous gravel; slightly effervescent; moderately alkaline.

A horizon

Hue: 5YR to 10YR
Value: 3 to 5, dry or moist
Chroma: 3 or 4, dry or moist
Texture: Loam or clay loam
Reaction: Neutral or slightly alkaline

Bt1 horizon

Hue: 2.5YR to 7.5YR
Value: 3 to 5, dry or moist
Chroma: 3 or 4, dry or moist
Texture: Clay loam or clay
Clay content: 35 to 55 percent (upper 20 inches of the argillic horizon)
Reaction: Neutral or slightly alkaline

Bt2 horizon

Hue: 2.5YR to 7.5YR, or 10YR
Value: 4 to 6, dry or moist
Chroma: 4 to 6, dry or moist
Texture: Clay, silty clay, loam, or clay loam
Rock fragments: 1 to 30 percent igneous fragments
Reaction: Neutral or slightly alkaline

Bk horizon

Hue: 2.5YR to 10YR
Value: 4 to 7, dry or moist
Chroma: 4 to 7, dry or moist
Texture: Loam, clay loam, or silty clay loam
Rock fragments: 1 to 30 percent igneous fragments
Calcium carbonate equivalent: 15 to 25 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Nillo Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Slow
Landforms: Flood plains
Parent material: Loamy alluvium derived from tuff
Elevation: 3,500 to 5,000 feet
Slope: 0 to 2 percent

Taxonomic Class

Fine-silty, mixed, superactive, calcareous, thermic Ustic Torrifluvents

Typical Profile

Typical pedon of Nillo silty clay in an area of Nillo silty clay, 0 to 2 percent slopes, occasionally flooded; McKinney Mountain, Texas USGS topographic quadrangle; Latitude: 29 degrees, 46 minutes, 26.076 seconds North; Longitude: 103 degrees, 48 minutes, 5.921 seconds West; NAD 83; UTM Easting: 615844 m, UTM Northing: 3294335 m, Zone 13.

A—0 to 3 inches; grayish brown (10YR 5/2) silty clay, dark brown (10YR 3/3) moist; weak medium platy and moderate fine subangular blocky structure; firm, hard, very sticky, very plastic; common very fine and common fine roots; strongly effervescent; moderately alkaline; abrupt smooth boundary.

C1—3 to 12 inches; light brown (7.5YR 6/3) stratified loam, brown (7.5YR 5/3) moist; massive; very friable, slightly hard, slightly sticky, slightly plastic; common fine roots and few medium roots; strongly effervescent; moderately alkaline; abrupt smooth boundary.

C2—12 to 26 inches; light brown (7.5YR 6/3) stratified loam, brown (7.5YR 4/3) moist; massive; friable, slightly hard, moderately sticky, moderately plastic; common fine roots and few medium roots; strongly effervescent; moderately alkaline; abrupt wavy boundary.

Ab—26 to 32 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; friable, hard, moderately sticky, moderately plastic; few fine roots; common very fine tubular pores; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bwb—32 to 46 inches; grayish brown (10YR 5/2) clay loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, hard, moderately sticky, moderately plastic; few fine roots; strongly effervescent; moderately alkaline; clear smooth boundary.

Bkb1—46 to 55 inches; brown (7.5YR 5/3) clay loam, brown (7.5YR 4/3) moist; weak fine and medium subangular blocky structure; friable, hard, moderately sticky, moderately plastic; few fine roots; 1 percent prominent carbonate coats on all faces of peds; 1 percent fine threadlike carbonate masses; 2 percent igneous gravel; violently effervescent; strongly alkaline; gradual wavy boundary.

Bkb2—55 to 66 inches; brown (7.5YR 5/3) clay loam, brown (7.5YR 4/3) moist; weak medium subangular blocky structure; friable, hard, moderately sticky, moderately plastic; few fine and few medium roots; 3 percent fine carbonate masses; violently effervescent; strongly alkaline; gradual smooth boundary.

Bkb3—66 to 80 inches; brown (7.5YR 5/3) clay loam, brown (7.5YR 4/3) moist; weak fine and medium subangular blocky structure; friable, hard, moderately sticky, moderately plastic; 5 percent fine carbonate masses; violently effervescent; strongly alkaline.

A horizon

Hue: 7.5YR or 10YR

Value: 3 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam, sandy clay loam, clay loam, or silty clay
Effervescence: Strongly or violently
Reaction: Moderately alkaline

C horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, very fine sandy loam, loam, silt loam, or silty clay loam
Clay content: 10 to 35 percent
Other features: Bedding planes and thin strata of variable textures are evident in most pedons
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Ab horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, dry or moist
Chroma: 2 or 3, dry or moist
Texture: Silty clay loam, clay loam, silty clay, or clay
Clay content: 25 to 55 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bwb or Bkb horizons

Hue: 5YR to 10YR
Value: 4 or 5, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Clay loam, silty clay loam, silty clay, or clay
Clay content: 30 to 55 percent
Calcium carbonate equivalent: Less than 15 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Nolam Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Fan remnants
Parent material: Gravelly alluvium and/or pedisediment derived from igneous and sedimentary rock
Elevation: 3,500 to 5,000 feet
Slope: 1 to 3 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Ustic Calciargids

Typical Profile

Typical pedon of Nolam gravelly fine sandy loam in an area of Nolam and Paisano soils, 1 to 3 percent slopes; Puerto Potrillo, Texas USGS topographic quadrangle; Latitude: 29 degrees, 50 minutes, 1.345 seconds North; Longitude: 103 degrees, 58 minutes, 20.572 seconds West; NAD 83; UTM Easting: 599279 m, UTM Northing: 3300802 m, Zone 13.

A—0 to 2 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; 5 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 23 percent igneous gravel; slightly effervescent; moderately alkaline; abrupt smooth boundary.

Btk1—2 to 11 inches; brown (7.5YR 4/3) extremely gravelly sandy clay loam, dark brown (7.5YR 3/3) moist; moderate fine and medium subangular blocky structure; 3 percent clay bridges on bottom surfaces of rock fragments; 30 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 2 percent fine irregular extremely weakly cemented white (10YR 8/1) dry, carbonate masses; 10 percent ignimbrite cobbles and 65 percent igneous gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.

Btk2—11 to 28 inches; light brown (7.5YR 6/3) very gravelly sandy clay loam, brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; 7 percent clay bridges on bottom surfaces of rock fragments; 100 percent prominent white (10YR 8/1) dry, carbonate coats on rock fragments; 40 percent very coarse irregular extremely weakly cemented white (10YR 8/1) dry, carbonate masses; 45 percent igneous gravel; violently effervescent; moderately alkaline; clear wavy boundary.

Btk3—28 to 45 inches; light reddish brown (5YR 6/4) very gravelly sandy clay loam, reddish brown (5YR 4/4) moist; moderate fine and medium subangular blocky structure; 10 percent distinct light reddish brown (5YR 6/4) dry, clay films on all faces of peds; 30 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 30 percent very coarse irregular extremely weakly cemented white (10YR 8/1) dry, carbonate masses; 30 percent extremely coarse irregular extremely weakly cemented white (10YR 8/1) dry, carbonate masses; 45 percent igneous gravel; violently effervescent; moderately alkaline; clear wavy boundary.

Bk1—45 to 63 inches; light reddish brown (5YR 6/3) gravelly sandy loam, reddish brown (5YR 4/4) moist; moderate fine and medium subangular blocky structure; 10 percent clay films on rock fragments and 5 percent clay bridges on bottom surfaces of rock fragments; 30 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 5 percent fine irregular extremely weakly cemented white (10YR 8/1) dry, carbonate masses; 33 percent igneous gravel; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bk2—63 to 80 inches; light brown (7.5YR 6/3) very gravelly sandy loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; 45 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 2 percent fine irregular very weakly cemented white (10YR 8/1) dry, carbonate masses; 45 percent igneous gravel; violently effervescent; moderately alkaline.

A horizon

Hue: 5YR or 7.5YR
Value: 3 to 6 dry, 3 to 5 moist
Chroma: 2 to 6, dry or moist
Texture: Sandy loam, fine sandy loam, or loam
Rock fragments: 5 to 60 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Btk and Bk horizons

Hue: 2.5YR to 7.5YR
Value: 3 to 6 dry, 3 to 5 moist
Chroma: 3 to 6, dry or moist
Texture: Sandy loam, loam, sandy clay loam, or clay loam
Clay content: 18 to 35 percent
Rock fragments: Greater than 35 percent

Effervescence: Slightly to violently
Reaction: Slightly alkaline or moderately alkaline

Bk horizon and (C horizons, where present)

Hue: 2.5YR to 10YR
Value: 4 to 8 dry, 3 to 8 moist
Chroma: 2 to 6, dry or moist
Texture: Sand, loamy sand, coarse sandy loam, sandy loam, fine sandy loam, or sandy clay
Effervescence: Slightly to violently
Reaction: Moderately alkaline

Ohtwo Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Talus slopes on escarpments
Parent material: Gravelly colluvium derived from tuff and/or basalt
Elevation: 3,500 to 5,000 feet
Slope: 20 to 45 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Ustic Haplocambids

Typical Profile

Typical pedon of Ohtwo very gravelly clay loam in an area of Lingua-Ohtwo complex, 20 to 45 percent slopes; Brewster County, Texas; Duff Springs, Texas USGS topographic quadrangle; Latitude: 29 degrees, 55 minutes, 7 seconds North; Longitude: 103 degrees, 39 minutes, 39 seconds West; NAD 83; UTM Easting: 629229 m, UTM Northing: 3310557 m, Zone 13.

A—0 to 8 inches; brown (7.5YR 4/3) very gravelly clay loam, dark brown (7.5YR 3/3) moist; moderate fine and medium granular structure; friable, slightly hard, moderately sticky, moderately plastic; 2 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 5 percent basalt cobbles and 40 percent basalt gravel; pebbles have degrading lime coats; very slightly effervescent; slightly alkaline; gradual smooth boundary.

Bk1—8 to 35 inches; brown (7.5YR 4/4) very gravelly clay loam, brown (7.5YR 4/3) moist; moderate fine and medium subangular blocky structure; firm, hard, moderately sticky, moderately plastic; 25 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 5 percent basalt cobbles and 35 percent basalt gravel; rock fragments have lime coats; slightly effervescent; slightly alkaline; clear wavy boundary.

Bk2—35 to 42 inches; brown (7.5YR 5/4) very cobbly loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; friable, hard, moderately sticky, moderately plastic; 10 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 5 percent basalt stones, 20 percent basalt gravels, and 25 percent basalt cobbles; rock fragments have lime coats; slightly effervescent; slightly alkaline; clear broken boundary.

Bk3—42 to 65 inches; brown (7.5YR 5/4) very gravelly loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; friable, slightly hard, moderately sticky, moderately plastic; 5 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 5 percent basalt cobbles and 35 percent basalt gravel; rock fragments have lime coats; slightly effervescent; slightly alkaline; very abrupt smooth boundary.

2R—65 to 75 inches; gray (10YR 5/1) indurated basalt bedrock, dark grayish brown (10YR 4/2) moist; 90 percent prominent white (10YR 8/1) dry, carbonate coats on upper surfaces of peds or rocks.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam or clay loam
Clay content: 20 to 35 percent
Rock fragments: 35 to 75 percent by volume
Effervescence: Very slightly or slightly
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 5YR to 10YR
Value: 4 to 6, dry or moist
Chroma: 3 to 5, dry or moist
Texture: Loam or clay loam
Clay content: 20 to 35 percent
Rock fragments: 35 to 75 percent
Effervescence: Slightly
Reaction: Slightly alkaline or moderately alkaline

2R layer

Kind: Unweathered basalt bedrock
Calcium carbonate coatings: On upper surfaces and in fractures
Other features: Tuffaceous paralithic material underlies some pedons

Ojinaga Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Fan remnants
Parent material: Gravelly fan alluvium derived from igneous and sedimentary rock
Elevation: 1,800 to 3,995 feet
Slope: 1 to 30 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Calcic Petrocalcids

Typical Profile

Typical pedon of Ojinaga very gravelly sandy loam in an area of Corazones and Ojinaga soils, 1 to 12 percent slopes; Arroyo Melado, Texas USGS topographic quadrangle; Latitude: 29 degrees, 42 minutes, 35.662 seconds North; Longitude: 104 degrees, 23 minutes, 9.933 seconds West; NAD 83; UTM Easting: 559382 m, UTM Northing: 3286799 m, Zone 13.

A—0 to 6 inches; brown (10YR 5/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure and weak medium platy; very friable, slightly hard, slightly sticky, slightly plastic; common very fine roots; 10 percent distinct white (10YR 8/1) dry, carbonate coats on all faces of peds and 35 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 45 percent igneous gravel; violently effervescent; strongly alkaline; gradual smooth boundary.

Bk—6 to 12 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; many very fine roots; 50 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 25 percent igneous gravels and 30 percent calcrete gravel; violently effervescent; moderately alkaline; very abrupt smooth boundary.

Bkkm1—12 to 16 inches; white (10YR 8/1) cemented material, light gray (10YR 7/2) moist; indurated laminar cap 2 to 3 mm thick, massive; strongly, cemented by carbonates; common very fine roots at top of horizon; 15 percent igneous gravel; violently effervescent; strongly alkaline; gradual smooth boundary.

Bkkm2—16 to 22 inches; white (10YR 8/1) cemented material, very pale brown (10YR 7/3) moist; massive; moderately, cemented by carbonates; few fine roots in cracks; 12 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 25 percent igneous gravel; strongly effervescent; strongly alkaline; gradual smooth boundary.

BCk1—22 or 34 inches; light gray (10YR 7/2) extremely gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, loose, nonsticky, nonplastic; common very fine roots; 50 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 35 percent extremely coarse irregular white (10YR 8/1) dry, carbonate masses; 65 percent igneous gravel; violently effervescent; strongly alkaline; gradual smooth boundary.

BCk2—34 to 49 inches; light gray (10YR 7/2) extremely gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, loose, nonsticky, nonplastic; common very fine and common fine roots; 35 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 2 percent fine platy white (10YR 8/1) dry; carbonate masses; 3 percent igneous cobbles and 62 percent igneous gravel; violently effervescent; strongly alkaline; clear smooth boundary.

CBk1—49 to 57 inches; light gray (10YR 7/2) extremely gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; single grain; loose, loose, nonsticky, nonplastic; common very fine roots; 10 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 1 percent fine irregular extremely weakly cemented white (10YR 8/1) dry, carbonate masses on bottom of rock fragments; 5 percent igneous cobbles and 80 percent igneous gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

CBk2—57 to 69 inches; light gray (10YR 7/2) extremely gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; single grain; loose, loose, nonsticky, nonplastic; 25 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 2 percent coarse irregular moderately cemented white (10YR 8/1) dry, carbonate nodules on bottom of rock fragments; 65 percent igneous gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

C—69 to 80 inches; brown (10YR 5/3) extremely gravelly loamy coarse sand, brown (10YR 4/3) moist; single grain; loose, loose, nonsticky, nonplastic; 35 percent prominent white (10YR 8/1) dry, carbonate coats on rock fragments; 1 percent very coarse cylindrical very pale brown (10YR 8/2) dry, carbonate masses; 65 percent igneous gravel; violently effervescent; moderately alkaline.

Ak or A horizon

Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam or loam
Clay content: 5 to 25 percent
Rock fragments: 35 to 75 percent, mostly igneous gravel and cobbles

Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 5 to 8 dry, 4 to 7 moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sandy loam, sandy loam, or loam
Clay content: 5 to 25 percent
Rock fragments: 35 to 85 percent, mostly igneous gravel and cobbles
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Bkkm horizon

Cementation: Strongly cemented material, becoming less cemented with depth indurated laminar cap 2 to 20 mm thick in some pedons
Thickness: 4 to 20 inches
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

BCk, CBk, and C horizons

Hue: 7.5YR or 10YR
Value: 5 to 8 dry, 4 to 7 moist
Chroma: 2 or 3, dry or moist
Texture: Loamy coarse sand to loam
Rock fragments: 35 to 85 percent igneous gravel and cobbles
Clay content: 5 to 18 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Paisano Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Fan remnants
Parent material: Gravelly alluvium and/or pedisediment derived from igneous and sedimentary rock
Elevation: 3,500 to 5,000 feet
Slope: 1 to 20 percent

Taxonomic Class

Loamy-skeletal, carbonatic, thermic, shallow Calcic Petrocalcids

Typical Profile

Typical pedon of Paisano very gravelly fine sandy loam in an area of Paisano very gravelly fine sandy loam, 1 to 8 percent slopes; Brewster County, Texas: Pena Blanca Mountains, Texas USGS topographic quadrangle; Latitude: 30 degrees, 5 minutes, 31 seconds North; Longitude: 103 degrees, 13 minutes 44 seconds West; NAD 83; UTM Easting: 670591 m, UTM Northing: 3330443 m, Zone 13.

A—0 to 3 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; weak medium granular structure; friable, slightly hard; common very fine and common fine roots; 35 percent mixed gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bk—3 to 8 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium granular structure; friable, slightly hard; common very fine and common fine roots; 45 percent mixed gravel; violently effervescent; moderately alkaline; abrupt wavy boundary.

Bkkm—8 to 14 inches; white (10YR 8/1) strongly cemented material; indurated; violently effervescent; moderately alkaline; clear wavy boundary.

BCk—14 to 80 inches; white (10YR 8/1) very gravelly sandy loam, white (10YR 8/1) moist; weak medium granular structure; friable, slightly hard; 50 percent mixed gravel; violently effervescent; moderately alkaline.

A and Bk horizons

Hue: 7.5YR or 10YR
Value: 4 to 8 dry, 3 to 6 moist
Chroma: 2 to 5, dry or moist
Texture: Sandy loam, fine sandy loam, or loam
Clay content: 5 to 20 percent
Rock fragments: 35 to 60 85 percent; fragments are mainly less than 3 inches in diameter, and are siliceous, sandstone, limestone, and strongly cemented calcium carbonate pan fragments; cobbles range from 0 to 10 15 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bkm horizon

Induration: Continuous except for scattered cracks and pockets
Effervescence: Strongly or violently
Reaction: Moderately alkaline

BCk horizon

Hue: 7.5YR or 10YR
Value: 6 to 8, dry or moist
Chroma: 1 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, loam, or sandy clay loam
Rock fragments: 35 to 60 percent by volume
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Pantak Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Hills
Parent material: Gravelly residuum weathered from igneous rock
Elevation: 3,500 to 5,000 feet
Slope: 1 to 30 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplargids

Typical Profile

Typical pedon of Pantak very gravelly sandy clay loam in an area of Pantak and Lingua soils, and Rock outcrop, 10 to 30 percent slopes; Sauceda Ranch, Texas USGS topographic quadrangle; Latitude: 29 degrees, 28 minutes, 20.281 seconds North; Longitude: 103 degrees, 59 minutes, 45.758 seconds West; NAD 83; UTM Easting: 597340 m, UTM Northing: 3260734 m, Zone 13.

A—0 to 3 inches; brown (7.5YR 4/4) very gravelly sandy clay loam, dark brown (7.5YR 3/4) moist; moderate fine and medium subangular blocky structure; friable, moderately hard, moderately sticky, moderately plastic; many very fine roots throughout; 60 percent brown (7.5YR 4/4) dry, clay films on rock fragments; 35 percent trachyte gravel; noneffervescent; slightly acid; clear smooth boundary.

Bt—3 to 8 inches; brown (7.5YR 4/3) extremely gravelly sandy clay loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky and weak fine subangular blocky structure; firm, hard, moderately sticky, moderately plastic; common very fine, common fine, and common medium roots; 20 percent distinct brown (7.5YR 4/4) dry, clay films on all faces of peds; 80 percent distinct brown (7.5YR 4/4) dry, clay films on rock fragments; 65 percent trachyte gravel; noneffervescent; slightly acid; very abrupt smooth boundary.

R—8 to 22 inches; brown (7.5YR 5/4) indurated trachyte bedrock, dark brown (7.5YR 3/4) moist; 70 percent distinct brown (7.5YR 4/4) dry, clay films on bedrock.

A horizon

Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 to 4 moist
Chroma: 1 to 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Rock fragments: 35 to 65 percent gravel, cobbles, or stones
Effervescence: None
Reaction: Moderately acid to slightly alkaline

Bt horizon

Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 1 to 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Rock fragments: 35 to 65 percent gravel, cobbles, or stones
Effervescence: None
Reaction: Moderately acid to slightly alkaline

R layer

Kind: Trachyte bedrock
Cementation: Indurated

Pantera Series

Depth class: Very deep
Drainage class: Excessively drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Flood plains on arroyos
Parent material: Holocene age sandy and gravelly alluvium derived from igneous and sedimentary rock
Elevation: 1,800 to 3,995 feet
Slope: 0 to 2 percent

Taxonomic Class

Sandy-skeletal, mixed, hyperthermic Ustic Torrifluvents

Typical Profile

Typical pedon of Pantera gravelly sandy loam in an area of Riverwash and Pantera soils, 0 to 2 percent slopes, frequently flooded; Arroyo Melado, Texas USGS topographic quadrangle; Latitude: 29 degrees, 42 minutes, 25.52 seconds North; Longitude: 104

degrees, 27 minutes, 5.35 seconds west; NAD 83; UTM Easting: 553058 m, UTM Northing: 3286455 m, Zone 13.

A—0 to 3 inches; brown (10YR 5/3) gravelly sandy loam, brown (10YR 4/3) moist; weak medium platy and weak fine and medium subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; common very fine roots; 20 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 32 percent igneous gravel; strongly effervescent; strongly alkaline; clear smooth boundary.

Ck1—3 to 11 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; single grain; loose, loose, nonsticky, nonplastic; few medium and many very fine roots; 25 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 30 percent igneous gravel; strongly effervescent; strongly alkaline; clear smooth boundary.

Ck2—11 to 18 inches; brown (10YR 5/3) very gravelly loamy coarse sand, brown (10YR 4/3) moist; single grain; loose, loose, nonsticky, nonplastic; few medium and common very fine roots; 15 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 5 percent igneous cobbles and 50 percent igneous gravel; strongly effervescent; strongly alkaline; clear wavy boundary.

C—18 to 80 inches; brown (10YR 5/3) stratified very gravelly coarse sand, brown (10YR 4/3) moist; single grain; loose, loose, nonsticky, nonplastic; common very fine and common fine roots; 5 percent faint white (10YR 8/1) dry, carbonate coats on rock fragments; 50 percent igneous gravel; noneffervescent; strongly alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loamy sand, sandy loam, fine sandy loam, or loam
Rock fragments: 15 to 60 percent
Effervescence: None to violently
Reaction: Moderately alkaline or strongly alkaline

Ck and C horizons

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sand, sand, loamy coarse sand, loamy sand, coarse sandy loam, sandy loam, or fine sandy loam
Rock fragments: 35 to 80 percent
Effervescence: None to violently
Reaction: Moderately alkaline or strongly alkaline

Pantera Taxadjunct

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Very slow
Landforms: Flood plains on alluvial flats
Parent material: Gypsiferous sandy and gravelly alluvium and/or lacustrine deposits derived from igneous rock
Elevation: 1,800 to 3,995 feet
Slope: 1 to 5 percent

Taxonomic Class

Sandy-skeletal, mixed, hyperthermic Ustic Haplogypsids

The Pantera soils in map unit MPB—Melado-Pantera soils, 1 to 5 percent slopes; are a taxadjunct to the series because they have gypsum throughout the profile.

Typical Profile

Typical pedon of Pantera gravelly coarse sandy loam (fig. 64) in an area of Melado and Pantera soils, 1 to 5 percent slopes; Arroyo Melado, Texas USGS topographic quadrangle; Latitude: 29 degrees, 44 minutes, 3.53 seconds North; Longitude: 104 degrees 29 minutes 17.10 seconds West; NAD 83; UTM Easting: 549505 m, UTM Northing: 3289456 m, Zone 13.

Ay—0 to 2 inches; brown (7.5YR 5/3) gravelly coarse sandy loam, brown (7.5YR 4/3) moist; weak fine subangular blocky structure; loose, nonsticky, nonplastic; 5 percent gypsum crystals, 25 percent igneous gravel; 80 percent fragments on the surface; strongly effervescent; strongly alkaline; clear smooth boundary.

By1—2 to 7 inches; brown (7.5YR 5/3) silty clay, brown (7.5YR 4/3) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; very firm, sticky, plastic; 5 percent gypsum crystals; strongly effervescent; strongly alkaline; clear smooth boundary.

By2—7 to 9 inches; brown (7.5YR 5/3) silty clay, brown (7.5YR 4/3) moist; weak coarse prismatic structure parting to weak medium subangular blocky; very firm, sticky, plastic; 25 percent gypsum crystals; strongly effervescent; strongly alkaline; abrupt smooth boundary.

Figure 64.—Profile of Pantera gravelly coarse sandy loam in an area of Melado and Pantera soils, 1 to 5 percent slopes. Pantera soils have very high amounts of rock fragments in the profile. (Scale in CM—Centimeter, FT—Feet)

2By3—9 to 19 inches; brown (10YR 5/3) extremely gravelly coarse sand, brown (10YR 4/3) moist; massive; loose, nonsticky, nonplastic; 10 percent gypsum crystals; 75 percent igneous gravel; slightly effervescent; strongly alkaline; clear smooth boundary.
2By4—19 to 41 inches; brown (10YR 5/3) extremely gravelly coarse sand, brown (10YR 4/3) moist; massive; loose, nonsticky, nonplastic; 20 percent gypsum crystals; 2 percent igneous cobbles, 78 percent igneous gravel; slightly effervescent; strongly alkaline; clear smooth boundary.
2By5—41 to 57 inches; brown (10YR 5/3) extremely gravelly coarse sandy loam, brown (10YR 4/3), moist; massive; loose; nonsticky, nonplastic; 15 percent gypsum crystals, unspecified with clear boundaries throughout; 65 percent igneous gravel; violently effervescent, strongly alkaline; clear smooth boundary.
2By6—57 to 80 inches; brown (10YR 5/3) stratified very gravelly coarse sand, brown (10YR 4/3), moist; single grain; loose, nonsticky and nonplastic; 10 percent gypsum crystals; 50 percent subrounded igneous gravel; violently effervescent; strongly alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loamy sand, coarse sandy loam, sandy loam, fine sandy loam, or loam
Rock fragments: 0 to 45 percent
Gypsum: 1 to 15 percent
EC (dS/m): 0 to 25
Effervescence: Slightly to violently
Reaction: Moderately alkaline or strongly alkaline

By horizon

Hue: 7.5YR or 10YR
Value: 4 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loamy sand, sandy loam, fine sandy loam, loam, silty clay loam, or silty clay
Rock fragments: 0 to 35 percent
Gypsum: 5 to 40 percent
EC (dS/m): 4 to 26
Effervescence: Slightly to violently
Reaction: Moderately alkaline or strongly alkaline

2B horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sand, sand, loamy sand, sandy loam, fine sandy loam, loam, or silty clay loam
Rock fragments: 35 to 80 percent
Gypsum: 5 to 35 percent
EC (dS/m): 8 to 20
Effervescence: Slightly to strongly
Reaction: Moderately alkaline or strongly alkaline

Pardo Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow

Landforms: Mesas, dip slopes on cuestas
Parent material: Gravelly residuum and/or colluvium derived from basalt and/or ignimbrite
Elevation: 4,500 to 6,695 feet
Slope: 1 to 8 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Lithic Petrocalcic Calciustolls

Typical Profile

Typical pedon of Pardo gravelly clay loam in area of Volco and Pardo soils, 1 to 8 percent slopes; Brewster County, Texas; Goat Mountain, Texas USGS topographic quadrangle; Latitude: 30 degrees, 3 minutes, 32 seconds North; Longitude: 103 degrees, 44 minutes, 44 seconds West; NAD 83; UTM Easting: 620881 m, UTM Northing: 3326092 m, Zone 13.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) gravelly clay loam, very dark brown (10YR 2/2) moist; moderate medium and coarse subangular blocky structure parting to fine and moderate medium granular; firm, hard, moderately sticky, moderately plastic; 1 percent white (10YR 8/1) dry, carbonate coats on rock fragments; 20 percent ignimbrite gravel; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—5 to 11 inches; dark grayish brown (10YR 4/2) very gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure parting to fine and moderate medium granular; firm, hard, moderately sticky, moderately plastic; 25 percent white (10YR 8/1) dry, carbonate coats on rock fragments; 20 percent ignimbrite cobbles and 25 percent ignimbrite gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Bk2—11 to 15 inches; grayish brown (10YR 5/2) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; friable, slightly hard, moderately sticky, slightly plastic; 30 percent white (10YR 8/1) dry, carbonate coats on rock fragments; 10 percent ignimbrite gravels, 15 percent petrocalcic cobbles, and 30 percent petrocalcic gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bkkm—15 to 18 inches; white (10YR 8/1) strongly cemented caliche, light gray (10YR 7/1) moist; violently effervescent; moderately alkaline; abrupt smooth boundary.

R—18 to 28 inches; light gray (10YR 7/1) unweathered, indurated, ignimbrite bedrock, light brownish gray (10YR 6/2) moist.

A horizon

Hue: 7.5YR or 10YR
Value: 2 to 5, dry or moist
Chroma: 2 or 3, dry or moist
Texture: Loam to clay loam
Rock fragments: 15 to 35 percent ignimbrite and detached caliche
Calcium carbonate equivalent: 2 to 15 percent
Effervescence: Slightly or strongly
Reaction: Moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 3 to 5, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam to clay loam
Rock fragments: 35 to 80 percent ignimbrite and detached caliche
Calcium carbonate equivalent: 20 to 40 percent
Effervescence: Slightly to violently
Reaction: Moderately alkaline

Bkkm horizon

Kind: Caliche
Cementation: Strongly cemented or indurated
Other features: Most pedons have an indurated laminar cap 2 to 5 mm thick
Effervescence: Slightly to violently
Reaction: Moderately alkaline

R layer

Kind: Noncalcareous, unweathered ignimbrite bedrock
Cementation: Indurated

Phantom Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Slow
Landforms: Alluvial flats
Parent material: Clayey alluvium derived from igneous and sedimentary rock
Elevation: 4,500 to 6,695 feet
Slope: 0 to 3 percent

Taxonomic Class:

Fine, smectitic, thermic Torrertic Haplustolls

Typical Profile

Typical pedon of Phantom clay loam in an area of Phantom clay loam, 0 to 2 percent slopes, occasionally flooded; Nancy Anne Ranch, Texas USGS topographic quadrangle; Latitude: 30 degrees, 27 minutes, 15.31 seconds North; Longitude: 104 degrees, 34 minutes, 6.10 seconds West; NAD 83; UTM Easting: 541440 m, UTM Northing: 3369201 m, Zone 13.

A—0 to 3 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; friable, hard; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bw1—3 to 16 inches; brown (10YR 4/3) clay, very dark grayish brown (10YR 3/2) moist; moderate medium angular blocky structure; firm, very hard; violently effervescent; moderately alkaline; gradual smooth boundary.

Bw2—16 to 27 inches; brown (10YR 4/3) clay, very dark grayish brown (10YR 3/2) moist; moderate medium angular blocky structure; firm, very hard; violently effervescent; moderately alkaline; clear smooth boundary.

Bk1—27 to 50 inches; brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; moderate medium subangular blocky structure; firm, very hard; violently effervescent; moderately alkaline; gradual smooth boundary.

Bk2—50 to 80 inches; light brown (7.5YR 6/4) clay, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; friable, hard; 4 percent medium carbonate masses; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: Clay loam, silty clay, or clay
Effervescence: Slightly or violently
Reaction: Neutral to moderately alkaline

B horizon

Hue: 7.5YR or 10YR
Value: 3 to 6 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: Clay loam, silty clay, or clay
Rock fragments: Contains a few gravel, cobbles, and stones in some pedons
Effervescence: Slightly to violently
Reaction: Moderately alkaline

Quadria Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Slow
Landforms: Fan remnants
Parent material: Clayey alluvium and/or pedisediment derived from tuff
Elevation: 3,500 to 5,000 feet
Slope: 0 to 2 percent

Taxonomic Class

Fine, mixed, superactive, thermic Ustic Natrargids

Typical Profile

Typical pedon of Quadria loam in an area of Quadria, Nolam, and Musgrave soils, 0 to 30 percent slopes; Brewster County, Texas; Long Hills, Texas USGS topographic quadrangle; Latitude: 29 degrees, 45 minutes, 2.00 seconds North; Longitude: 103 degrees, 43 minutes, 18.00 seconds West; NAD 83; UTM Easting: 623478 m, UTM Northing: 3291813 m, Zone 13.

A—0 to 5 inches; brown (7.5YR 5/3) loam, dark brown (7.5YR 3/3) moist; moderate fine and medium subangular blocky structure; friable, slightly hard; common very fine, common fine, common medium, and common coarse roots; common very fine and fine tubular pores; 5 percent ignimbrite gravel; slightly effervescent; slightly alkaline; abrupt smooth boundary.

Btn1—5 to 11 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist; moderate coarse prismatic structure parting to moderate medium and coarse subangular blocky; very firm, very hard; common very fine, common fine, common medium, and common coarse roots; common very fine, fine, medium, and coarse tubular pores; 75 percent distinct reddish brown (5YR 5/3) clay films on faces of peds; strongly effervescent; moderately alkaline; clear smooth boundary.

Btn2—11 to 17 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist; moderate coarse prismatic structure parting to moderate medium and coarse subangular blocky; very firm, very hard; common very fine, common fine, common medium, and common coarse roots; common very fine and fine tubular pores; 75 percent distinct reddish brown (5YR 5/3) clay films on faces of peds; 2 percent mixed gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Btkn1—17 to 24 inches; light reddish brown (5YR 6/4) gravelly clay, reddish brown (5YR 5/4) moist; weak medium and coarse subangular blocky structure parting to weak fine and medium subangular blocky; very firm, very hard; common very fine and fine roots; few very fine and fine tubular pores; 1 percent distinct white (10YR 8/1) carbonate coats on faces of peds and 30 percent discontinuous distinct white (10YR 8/1) carbonate coats on rock fragments; violently effervescent; moderately alkaline; clear smooth boundary.

Btkn2—24 to 31 inches; light reddish brown (5YR 6/4) very gravelly clay loam, reddish brown (5YR 5/4) moist; weak medium and coarse subangular blocky structure parting

to weak fine and medium subangular blocky; firm, hard; common very fine and fine roots; few very fine and fine tubular pores; 1 percent distinct white (10YR 8/1) carbonate coats on faces of peds, and 10 percent distinct white (10YR 8/1) carbonate coats on lower surfaces of peds or rocks; 3 percent medium and coarse irregular white (10YR 8/1) carbonate masses; violently effervescent; moderately alkaline; gradual smooth boundary.

Btkn3—31 to 46 inches; light reddish brown (5YR 6/4) very gravelly sandy clay loam, reddish brown (5YR 5/4) moist; weak medium and coarse subangular blocky structure parting to weak fine and medium subangular blocky; firm, slightly hard; few very fine and fine roots; few very fine and fine tubular pores; 1 percent distinct white (10YR 8/1) carbonate coats on faces of peds and 10 percent distinct white (10YR 8/1) carbonate coats on rock fragments; 3 percent medium and coarse irregular white (10YR 8/1) carbonate masses; strongly effervescent; moderately alkaline; clear smooth boundary.

Bkn—46 to 57 inches; light reddish brown (5YR 6/3) fine sandy loam, reddish brown (5YR 5/3) moist; weak fine and medium subangular blocky structure; friable, slightly hard; few very fine and fine roots; few very fine and fine tubular pores; 3 percent medium and coarse irregular white (10YR 8/1) carbonate masses; very slightly effervescent; moderately alkaline; clear smooth boundary.

BCk—57 to 80 inches; reddish brown (5YR 5/3) gravelly coarse sandy loam, reddish brown (5YR 4/3) moist; weak fine and medium subangular blocky structure; friable, soft; few very fine and fine roots; few very fine and fine tubular pores; 1 percent distinct white (10YR 8/1) carbonate coats on faces of peds, and 10 percent distinct white (10YR 8/1) carbonate coats on rock fragments; 1 percent medium irregular white (10YR 8/1) carbonate masses, and 3 percent coarse irregular white (10YR 8/1) carbonate masses; 20 percent rounded ignimbrite gravel, and 10 percent subrounded ignimbrite cobbles; very slightly effervescent; slightly alkaline.

A horizon

Hue: 5YR to 10YR
Value: 5 or 6 dry, 3 moist
Chroma: 3 or 4, dry or moist
Texture: Loam
Rock fragments: 0 to 15 percent ignimbrite
Effervescence: Slightly
Reaction: Slightly alkaline or moderately alkaline

Btn horizon

Hue: 5YR or 7.5YR
Value: 3 to 5, dry or moist
Chroma: 3 to 6, dry or moist
Texture: Clay or silty clay
Clay content: 40 to 60 percent
Rock fragments: 0 to 15 percent ignimbrite
Calcium carbonate equivalent: Less than 15 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Btkn horizon

Hue: 5YR or 7.5YR
Value: 4 to 7, dry or moist
Chroma: 4 to 6, dry or moist
Texture: Sandy clay loam, clay loam, or clay
Clay content: 20 to 40 percent

Rock fragments: 0 to 30 percent ignimbrite
Calcium carbonate equivalent: 15 to 30 percent
EC (dS/m): 4 to 12
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bkn and BCkn horizons

Hue: 5YR or 7.5YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Other features: These horizons are beneath lithologic discontinuities, and located more than 40 inches below the soil surface
Texture: Coarse sandy loam, sandy loam, or fine sandy loam
Clay content: 12 to 20 percent
Rock fragments: 5 to 30 percent ignimbrite
Calcium carbonate equivalent: Less than 10 percent
EC (dS/m): 4 to 12
Effervescence: None or slightly
Reaction: Slightly alkaline or moderately alkaline

Redford Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Fan remnants
Parent material: Gravelly alluvium and residuum derived from fanglomerate
Elevation: 1,800 to 3,995 feet
Slope: 1 to 70 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, hyperthermic Lithic Ustic Haplocalcids

Typical Profile

Typical pedon of Redford very gravelly sandy loam in an area of Redford and Corazones soils, 10 to 30 percent slopes; Santana Mesa, Texas USGS topographic quadrangle; Latitude: 29 degrees, 19 minutes, 6.3 seconds North; Longitude: 103 degrees, 59 minutes, 23.3 seconds West; NAD 83; UTM Easting: 598094 m, UTM Northing: 3243688 m, Zone 13.

A—0 to 3 inches; very pale brown (10YR 7/3) very gravelly sandy loam, brown (10YR 5/3) moist; weak very fine subangular blocky structure; very friable, soft, nonsticky, nonplastic; common very fine and fine roots; 55 percent igneous gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk—3 to 14 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak very fine subangular blocky structure; common very fine and fine roots; very friable, soft, nonsticky, nonplastic; 30 percent igneous gravel; calcium carbonate equivalent is 10 percent; violently effervescent; moderately alkaline; abrupt smooth boundary.

R—14 to 24 inches; very pale brown (10YR 8/2) strongly cemented fanglomerate bedrock, light brownish gray (10YR 6/2) moist; very high excavation difficulty; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, or loam
Rock fragments: 25 to 70 percent
Effervescence: Slightly to strongly
Reaction: Moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 4 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Sandy loam, fine sandy loam, or loam
Rock fragments: 25 to 85 percent
Calcium carbonate equivalent: 5 to 30 percent
Effervescence: Strongly to violently
Reaction: Moderately alkaline

R layer

Kind: Fanglomerate bedrock
Cementation: Strongly cemented

Redlight Series

Depth class: Shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately
Landforms: Hills, mountains
Parent material: Gravelly colluvium derived from limestone over gravelly residuum weathered from limestone
Elevation: 2,995 to 3,995 feet
Slope: 5 to 35 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, hyperthermic, Lithic Ustic Haplocalcids

Typical Profile

Typical pedon of Redlight very gravelly sandy loam in an area of Redlight and Terlingua soils and Rock outcrop, 5 to 35 percent slopes; Hudspeth County, Texas; Lobo SW, Texas USGS topographic quadrangle; Latitude: 30 degrees, 46 minutes, 5.04 seconds north; Longitude: 104 degrees, 56 minutes, 5.21 seconds west; NAD 83; UTM Easting: 506241 m, UTM Northing: 3403900 m, Zone 13.

A—0 to 7 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 5/3) moist; weak fine granular structure; soft, very friable; common fine roots; 37 percent subangular indurated mixed gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Bk—7 to 15 inches; very pale brown (10YR 7/4) very gravelly coarse sandy loam, light yellowish brown (10YR 6/4) moist; weak fine subangular blocky structure; soft, very friable; common fine roots; 3 percent fine faint carbonate masses, 5 percent medium faint carbonate masses, 38 percent subangular indurated mixed gravel; violently effervescent; moderately alkaline; clear smooth boundary.

R—15 inches; indurated limestone bedrock.

A horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sandy loam, sandy loam, loam, or silt loam
Clay content: 8 to 15 percent
Rock fragments: 35 to 85 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 5 to 8 dry, 4 to 7 moist
Chroma: 2 to 4, dry or moist
Texture: Loam, coarse sandy loam, sandy loam, or silt loam
Clay content: 8 to 15 percent
Rock fragments: 35 to 85 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

R layer

Kind: Limestone bedrock
Cementation: Indurated

Reduff Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately
Landforms: Hills
Parent material: Gravelly residuum and/or colluvium derived from tuff
Elevation: 3,500 to 5,000 feet
Slope: 10 to 30 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, nonacid, thermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Reduff very gravelly loam in an area of Reduff, Scotal, and Holguin soils, 1 to 30 percent slopes; Brewster County, Texas; Paradise Draw, Texas USGS topographic quadrangle; Latitude: 29 degrees, 56 minutes, 13 seconds North; Longitude: 103 degrees, 46 minutes, 49 seconds West; NAD 83; UTM Easting: 617791 m, UTM Northing: 3312231 m, Zone 13.

A—0 to 4 inches; reddish brown (5YR 5/3) very gravelly loam, reddish brown (5YR 4/3) moist; weak fine subangular blocky structure parting to weak fine granular; many very fine and fine roots; 20 percent subangular and 30 percent angular tuff gravel; very slightly effervescent; moderately alkaline; abrupt smooth boundary.

C—4 to 15 inches; reddish brown (5YR 5/3) extremely gravelly loam, reddish brown (5YR 4/3) moist; weak fine granular structure; common very fine, common fine, and common medium roots in cracks; 5 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 15 percent tuff stones, 25 percent subangular and 40 percent angular tuff gravel; noneffervescent; slightly alkaline; abrupt smooth boundary.

R—15 to 25 inches; light reddish brown (2.5YR 6/4) weathered tuff bedrock, reddish brown (2.5YR 4/4) moist; strongly cemented; noneffervescent.

A horizon

Hue: 2.5YR to 7.5YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam or clay loam
Rock fragments: 35 to 60 percent
Effervescence: None to slightly
Reaction: Neutral to moderately alkaline

C horizon (where present)

Hue: 2.5YR to 7.5YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam or clay loam
Rock fragments: 35 to 80 percent
Effervescence: None
Reaction: Neutral to moderately alkaline

R layer

Kind: Noncalcareous tuff bedrock of the Duff and Pruett Formations

Rockhouse Taxadjunct

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Flood plains
Parent material: Gravelly alluvium derived from igneous rock
Elevation: 4,500 to 6,695 feet
Slope: 0 to 1 percent

Taxonomic Class

Loamy-skeletal, mixed, thermic Fluventic Haplustolls

The Rockhouse soils in map unit RMB—Rockhouse, flooded-Medley complex, 0 to 5 percent slopes, is a taxadjunct to the series because they are loamy-skeletal. The Rockhouse series is sandy-skeletal, mixed, thermic Fluventic Haplustolls.

Typical Profile

Typical pedon of Rockhouse loam in an area of Rockhouse, flooded-Medley complex, 0 to 5 percent slopes; San Esteban Lake SW, Texas USGS topographic quadrangle; Latitude: 30 degrees, 5 minutes, 37.05 seconds North; Longitude: 104 degrees, 13 minutes, 4.02 seconds West; NAD 83; UTM Easting: 575373 m, UTM Northing: 3329418 m, Zone 13.

A1—0 to 2 inches; brown (7.5YR 4/3) loam, very dark brown (7.5YR 2.5/2) moist; weak medium subangular blocky structure; slightly hard, friable, sticky, plastic; 10 percent igneous gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

A2—2 to 13 inches; dark brown (7.5YR 3/3) loam, very dark brown (7.5YR 2.5/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, sticky, plastic; 2 percent faint clay films on all faces of peds; 10 percent igneous gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

Bk1—13 to 46 inches; brown (7.5YR 4/3) very gravelly loam, very dark brown (7.5YR 2.5/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, sticky, plastic; 4 percent igneous cobbles and 40 percent igneous gravel; violently effervescent; moderately alkaline; gradual wavy boundary.

Bk2—46 to 80 inches; brown (7.5YR 4/3) gravelly sandy loam, very dark brown (7.5YR 2.5/2) moist; weak granular structure; slightly hard, friable, sticky, plastic; 3 percent igneous cobbles and 15 percent igneous gravel; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 to 3 moist
Chroma: 2 or 3, dry or moist
Texture: Fine sandy loam, loam, or sandy clay loam
Rock fragments: 5 to 40 percent
Effervescence: Slightly to violently
Reaction: Neutral to moderately alkaline

Bk horizon (or C horizon where present)

Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, loam, or sandy clay loam
Rock fragments: 35 to 80 percent, with 20 to 50 percent gravel, 10 to 40 percent cobbles, and 0 to 25 percent stones
Effervescence: Slightly to violently
Reaction: Moderately alkaline or strongly alkaline

Sanmoss Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately
Landforms: Proximal fan piedmonts
Parent material: Gravelly fan alluvium derived from igneous rock
Elevation: 4,500 to 6,695 feet
Slope: 1 to 5 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Pachic Haplustolls

Typical Profile

Typical pedon of Sanmoss very gravelly loam in an area of Sanmoss-Medley complex, 1 to 5 percent slopes; Nancy Anne Ranch, Texas USGS topographic quadrangle; Latitude: 30 degrees, 28 minutes, 8.19 seconds North; Longitude: 104 degrees, 37 minutes, 0.44 seconds West; NAD 83; UTM Easting: 536785 m, UTM Northing: 3370812 m, Zone 13.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; friable, slightly hard; 40 percent igneous gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

Bw—3 to 12 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; friable, slightly hard; 35 percent igneous gravel; strongly effervescent; slightly alkaline; clear smooth boundary.

Bk1—12 to 21 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; friable, slightly hard; 2 percent fine masses of calcium carbonate; 40 percent igneous gravel and 5 percent igneous cobbles; violently effervescent; moderately alkaline; gradual wavy boundary.

Bk2—21 to 40 inches; brown (7.5YR 5/3) very gravelly loam, dark brown (7.5YR 3/3) moist; weak medium subangular blocky structure; friable, slightly hard; 2 percent fine masses of calcium carbonate; 45 percent igneous gravel and 5 percent igneous cobbles; violently effervescent; moderately alkaline; gradual wavy boundary.

Bk3—40 to 55 inches; light yellowish brown (10YR 6/4) very gravelly loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; friable, slightly hard; 2 percent fine masses of calcium carbonate; 30 percent igneous gravel and 5 percent igneous cobbles; violently effervescent; moderately alkaline; gradual wavy boundary.

C—55 to 80 inches; light brown (7.5YR 6/4) very gravelly sandy loam, brown (7.5YR 5/4) moist; single grain; very friable, slightly hard; 35 percent igneous gravel and 10 percent igneous cobbles; strongly effervescent; moderately alkaline.

A or Bw horizons

Hue: 5YR to 10YR
Value: 2.5 to 5 dry, 1 to 3 moist
Chroma: 1 to 3, dry or moist
Texture: Sandy loam, loam, sandy clay loam, or clay loam
Rock fragments: 25 to 60 percent
Calcium carbonate equivalent: 0 to 5 percent
Effervescence: None to slightly
Reaction: Neutral to moderately alkaline

Bk horizon

Hue: 5YR to 10YR
Value: 2.5 to 6 dry, 2 to 5 moist
Chroma: 2 to 5, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Clay content: 15 to 35 percent
Rock fragments: 25 to 80 percent
Calcium carbonate equivalent: 2 to 15 percent
Effervescence: Slightly to violently
Reaction: Slightly alkaline or moderately alkaline

C horizon

Hue: 5YR to 10YR
Value: 4 to 6, dry or moist
Chroma: 4 or 5, dry or moist
Texture: Sandy loam, loam, sandy clay loam, or clay loam
Clay content: 10 to 35 percent
Rock fragments: 35 to 80 percent
Calcium carbonate equivalent: 2 to 10 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Sauceda Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately
Landforms: Dissected dip slopes on cuestas, dip slopes, hills

Parent material: Residuum weathered from ignimbrite
Elevation: 3,500 to 5,000 feet
Slope: 1 to 8 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Sauceda very gravelly loam in an area of Sauceda and Boludo soils, 1 to 8 percent slopes; Puerto Potrillo, Texas USGS topographic quadrangle; Latitude: 29 degrees, 45 minutes, 31 seconds North; Longitude: 103 degrees, 54 minutes, 39 seconds West; NAD 83; UTM Easting: 605304 m, UTM Northing: 3292535 m, Zone 13.

A1—0 to 2 inches; brown (7.5YR 4/2) very gravelly loam, dark brown (7.5YR 3/2) moist; moderate medium and fine granular structure; slightly hard, friable; many very fine and fine roots; 50 percent ignimbrite gravel; slightly effervescent; moderately alkaline; abrupt smooth boundary.

A2—2 to 8 inches; brown (7.5YR 4/3) very cobbly loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable; many very fine and fine roots; few films, threads, and masses of calcium carbonate; 20 percent ignimbrite gravel; 30 percent ignimbrite cobbles with coatings of calcium carbonate; strongly effervescent; moderately alkaline; abrupt wavy boundary.

Rk—8 to 14 inches; slightly fractured ignimbrite bedrock with coatings of calcium carbonate in fractures; common very fine and fine roots in fractures; many pendants from 2 to 6 mm thick on lower side of upper layers; clear wavy boundary.

R—14 to 22 inches; slightly fractured ignimbrite bedrock.

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 or 3, dry or moist
Texture: Fine sandy loam or loam
Rock fragments: 35 to 60 percent ignimbrite and petrocalcic gravel, cobbles, and stones
Effervescence: Slightly to strongly
Reaction: Moderately alkaline

R layer

Kind: Ignimbrite bedrock
Fractures: Fractured in the upper part, but is less fractured with depth
Cementation: Very strongly cemented or indurated
Excavation difficulty: Extremely high

Scotal Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately
Landforms: Dip slopes on cuestas, hillslopes, escarpments
Parent material: Gravelly residuum and/or colluvium derived from tuff
Elevation: 3,500 to 5,000 feet
Slope: 1 to 60 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Scotal very gravelly sandy clay loam in an area of Scotal and Holguin soils, 1 to 8 percent slopes; Brewster County, Texas; Whirlwind Spring, Texas USGS topographic quadrangle; Latitude: 29 degrees, 55 minutes, 5.00 seconds North; Longitude: 103 degrees, 37 minutes, 12.00 seconds West; NAD 83; UTM Easting: 633175 m, UTM Northing: 3310488 m, Zone 13.

A—0 to 3 inches; brown (10YR 5/3) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate very fine and fine granular structure; friable, slightly hard, slightly sticky, slightly plastic; common very fine and fine roots; 35 percent tuff gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk—3 to 8 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; friable, slightly hard, common very fine and fine roots; 45 percent tuff gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

R/Bk—8 to 14 inches; white (10YR 8/1) tuff; fractures are 5 to 7 inches apart and filled with yellowish brown (10YR 5/4) soil material from above common very fine and fine roots in cracks; abrupt smooth boundary.

R—14 to 24 inches; unweathered tuff bedrock.

A and Bk horizons

Hue: 10YR or 2.5Y
Value: 3 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, loam, sandy clay loam, or clay loam
Rock fragments: 35 to 80 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

R layer

Kind: Noncalcareous, unweathered white tuff of the Duff and Pruett Formations

Stillwell Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately
Landforms: Erosion remnant on pediments, fan remnants
Parent material: Gravelly alluvium derived from limestone
Elevation: 1,800 to 3,995 feet
Slope: 1 to 30 percent

Taxonomic Class

Loamy-skeletal, carbonatic, hyperthermic Sodic Ustic Haplocalcids

Typical Profile

Typical pedon of Stillwell very gravelly coarse sandy loam in an area of Rock outcrop-Stillwell complex, 1 to 8 percent slopes; Brewster County, Texas; Terlingua, Texas USGS topographic quadrangle; Latitude; 29 degrees, 20 minutes, 0.37 seconds North; Longitude: 103 degrees, 36 minutes, 49.46 seconds West; NAD 83; UTM Easting: 634593 m, UTM Northing: 3245726 m, Zone 13.

A1—0 to 2 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; moderate medium granular structure; very friable, slightly hard, slightly sticky, nonplastic; common very fine and common fine roots; 2 percent

limestone cobbles and 35 percent limestone gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

A2—2 to 7 inches; light yellowish brown (10YR 6/4) very gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium granular structure; very friable, slightly hard, slightly sticky, nonplastic; common very fine and common fine roots; 40 percent limestone gravel; violently effervescent; moderately alkaline; abrupt wavy boundary.

Bk1—7 to 13 inches; very pale brown (10YR 8/4) very gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; friable, hard, slightly sticky, nonplastic; common very fine and common fine roots; 10 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 40 percent limestone gravel; violently effervescent; moderately alkaline; abrupt wavy boundary.

Bk2—13 to 25 inches; light gray (10YR 7/2) very gravelly fine sandy loam, light yellowish brown (10YR 6/4) moist; weak fine subangular blocky structure; friable, hard, slightly sticky, nonplastic; common very fine and common fine roots; 10 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 2 percent fine irregular carbonate masses; 35 percent limestone gravel; violently effervescent; moderately alkaline; clear wavy boundary.

BCk1—25 to 37 inches; pink (7.5YR 7/4) extremely gravelly coarse sandy loam, brown (7.5YR 5/4) moist; weak fine granular structure; very friable, soft, nonsticky, nonplastic; few very fine and few fine roots; 15 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 65 percent limestone gravel; violently effervescent; moderately alkaline; gradual wavy boundary.

BCk2—37 to 60 inches; pink (7.5YR 7/4) extremely gravelly coarse sandy loam, brown (7.5YR 5/4) moist; weak fine granular structure; very friable, soft, nonsticky, nonplastic; few very fine and few fine roots; 60 percent limestone gravel; violently effervescent; moderately alkaline; diffuse wavy boundary.

BCk3—60 to 80 inches; pink (7.5YR 7/4) extremely gravelly coarse sandy loam, brown (7.5YR 5/4) moist; weak very fine granular structure, and weak fine granular structure; very friable, soft, nonsticky, nonplastic; 65 percent limestone gravel; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 5 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sandy loam, sandy loam, fine sandy loam, or loam
Rock fragments: 35 to 60 percent, primarily gravel
Calcium carbonate equivalent: 35 to 70 percent
Effervescence: Violently
Reaction: Moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 5 to 8, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sandy loam, sandy loam, fine sandy loam, or loam
Rock fragments: 35 to 60 percent mainly gravel
Calcium carbonate equivalent: 40 to 70 percent
Effervescence: Violently
Reaction: Moderately alkaline

BCk horizon

Hue: 7.5YR or 10YR

Value: 5 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loamy coarse sand, coarse sandy loam, sandy loam, or loam
Rock fragments: 35 to 80 percent
Calcium carbonate equivalent: 40 to 80 percent
SAR: 20 to 35
EC (dS/m): 2 to 8
Effervescence: Violently
Reaction: Moderately alkaline

Straddlebug Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Alluvial flats
Parent material: Loamy alluvium derived from tuff
Elevation: 3,500 to 5,000 feet
Slope: 1 to 3 percent

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Sodic Ustic Haplocambids

Typical Profile

Typical pedon of Straddlebug silty clay loam in an area of Straddlebug silty clay loam, 0 to 3 percent slopes; in Brewster County, Texas; Duff Springs, Texas USGS topographic quadrangle; Latitude: 29 degrees, 53 minutes, 6.00 seconds North; Longitude: 103 degrees, 41 Minutes, 14.00 seconds West; NAD 83; UTM Easting: 626721 m, UTM Northing: 3306785 m, Zone 13.

A1—0 to 4 inches; pinkish gray (7.5YR 6/2) silty clay loam, brown (7.5YR 4/2) moist; moderate medium subangular blocky structure and weak thin platy; firm, hard, moderately sticky, moderately plastic; common fine and medium roots; common very fine and fine interstitial pores; 1 percent tuff gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

A2—4 to 11 inches; brown (7.5YR 5/2) clay, dark brown (7.5YR 3/2) moist; weak coarse prismatic structure parting to moderate medium and coarse angular blocky; firm, hard, moderately sticky, moderately plastic; common very fine, fine, and coarse roots; common very fine and fine moderate continuity tubular pores; 1 percent tuff gravel; violently effervescent; moderately alkaline; gradual smooth boundary.

Bnb—11 to 18 inches; brown (7.5YR 5/2) clay, brown (7.5YR 4/2) moist; weak coarse prismatic structure parting to moderate medium and coarse angular blocky; firm, hard, moderately sticky, moderately plastic; common very fine and fine roots; few very fine moderate continuity tubular pores; 2 percent tuff gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Bknb1—18 to 26 inches; brown (7.5YR 5/3) clay loam, brown (7.5YR 4/3) moist; weak medium and coarse subangular blocky structure; firm, hard, moderately sticky, moderately plastic; few very fine roots; common very fine moderate continuity tubular pores; 3 percent prominent white (10YR 8/1) dry, carbonate coats on faces of peds; 10 percent medium masses of calcium carbonate; 5 percent tuff gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Bknb2—26 to 33 inches; light brown (7.5YR 6/3) sandy clay loam, brown (7.5YR 5/3) weak medium and coarse subangular blocky structure; firm, hard, moderately sticky, moderately plastic; few very fine roots; common fine tubular and common very fine tubular pores; 2 percent prominent white (10YR 8/1) dry, carbonate coats on faces of

peds; 5 percent fine masses of calcium carbonate; 3 percent tuff gravel; violently effervescent; moderately alkaline; gradual smooth boundary.

Bknb3—33 to 46 inches; light brown (7.5YR 6/3) fine sandy loam, brown (7.5YR 5/3) moist; weak medium and coarse subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine roots; few very fine tubular pores; 2 percent prominent white (10YR 8/1) dry, carbonate coats on faces of peds; 5 percent medium masses of calcium carbonate; 5 percent tuff gravel; violently effervescent; moderately alkaline; gradual smooth boundary.

Bknb4—46 to 58 inches; light brown (7.5YR 6/3) fine sandy loam, brown (7.5YR 5/3) moist; weak medium and coarse subangular blocky structure; friable, slightly hard, slightly sticky, slightly plastic; few very fine roots; few very fine tubular pores; 2 percent prominent white (10YR 8/1) dry, carbonate coats on faces of peds; 5 percent medium masses of calcium carbonate; 5 percent tuff gravel; violently effervescent; moderately alkaline; gradual smooth boundary.

Bknb5—58 to 80 inches; light brown (7.5YR 6/3) clay loam, brown (7.5YR 5/3) moist; weak medium and coarse subangular blocky structure; firm, slightly hard, slightly sticky, slightly plastic; common prominent white (10YR 8/1) dry, carbonate coats on faces of peds; 5 percent medium masses of calcium carbonate; 2 percent tuff gravel; violently effervescent; moderately alkaline.

A1 horizon

Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 moist
Chroma: 2 to 4, dry or moist
Texture: Silty clay loam or clay loam
Clay content: 27 to 40 percent
Rock fragments: 0 to 5 percent
Calcium carbonate equivalent: 1 to 10 percent
Effervescence: Violently
Reaction: Moderately alkaline

A2 horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 moist
Chroma: 2 to 4, dry or moist
Texture: Silty clay loam, clay loam, or clay
Clay content: 27 to 35 percent
Rock fragments: 0 to 5 percent
Calcium carbonate equivalent: 1 to 10 percent
Effervescence: Violently
Reaction: Moderately alkaline

Bn horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 moist
Chroma: 2 to 4, dry or moist
Texture: Silty clay loam, clay loam, or clay
Rock fragments: 0 to 10 percent
Calcium carbonate equivalent: 1 to 10 percent
Effervescence: Violently
Reaction: Moderately alkaline

Bkn horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: Loamy coarse sand to silty clay
Rock fragments: 0 to 15 percent, but individual thin strata may contain up to 45 percent
Calcium carbonate equivalent: 2 to 15 percent
Effervescence: Violently
Reaction: Moderately alkaline

Strawhouse Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately
Landforms: Erosion remnant on pediments, fan remnants
Parent material: Gravelly alluvium and/or pedisediment derived from limestone
Elevation: 1,800 to 3,995 feet
Slope: 1 to 16 percent

Taxonomic Class

Loamy-skeletal, carbonatic, hyperthermic, shallow Calcic Petrocalcids

Typical Profile

Typical pedon of Strawhouse very gravelly sandy loam in an area of Strawhouse-Stillwell complex, 1 to 8 percent slopes; Brewster County, Texas; Hen Egg Mountain, Texas USGS topographic quadrangle; Latitude: 29 degrees, 24 minutes, 16.776 seconds North; Longitude: 103 degrees, 37 minutes, 8.616 seconds West; NAD 83; UTM Easting: 633983 m, UTM Northing: 3253613 m, Zone 13.

A—0 to 3 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; friable, hard, slightly sticky, slightly plastic; common fine and medium roots; 50 percent limestone gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Bk—3 to 7 inches; light brownish gray (10YR 6/2) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; friable, hard, slightly sticky, slightly plastic; common very fine, fine, and medium roots; 20 percent carbonate coats on rock fragments; 1 percent threadlike carbonate masses; 50 percent limestone gravel; violently effervescent; moderately alkaline; abrupt wavy boundary.

Bkkm1—7 to 17 inches; very pale brown (10YR 8/2) cemented material, very pale brown (10YR 8/2) moist; massive; very strongly; common fine roots top of horizon; 50 percent limestone gravel; violently effervescent; moderately alkaline; abrupt wavy boundary.

Bkkm2—17 to 28 inches; very pale brown (10YR 8/2) cemented material, very pale brown (10YR 8/2) moist; massive; strongly; common fine roots top of horizon; 50 percent limestone gravel; violently effervescent; moderately alkaline; abrupt wavy boundary.

BCk—28 to 80 inches; 65 percent very pale brown (10YR 8/2) and 35 percent yellowish brown (10YR 5/4) very gravelly sandy clay loam, 65 percent very pale brown (10YR 8/2) and 35 percent dark yellowish brown (10YR 4/6) moist; massive; firm, hard, moderately sticky, moderately plastic; 50 percent limestone gravel; violently effervescent; moderately alkaline.

A and Bk horizons

Hue: 7.5YR or 10YR
Value: 6 to 8 dry, 4 or 6 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam or loam
Clay content: 15 to 27 percent
Rock fragments: 35 to 60 percent limestone and petrocalcic fragments, mainly gravel
Effervescence: Violently
Reaction: Moderately alkaline

Bkkm horizon

Hue: 7.5YR or 10YR
Value: 7 or 8 dry, 6 to 8 moist
Chroma: 1 to 5, dry or moist
Cementation: Strong in upper part, decreasing with depth; some pedons have an indurated laminar cap 2 to 5 mm thick
Effervescence: Violently
Reaction: Moderately alkaline

BCk or CBk horizons

Hue: 7.5YR or 10YR
Value: 6 to 8 dry, 4 to 6 moist
Chroma: 1 to 5, dry or moist
Texture: Coarse sandy loam, sandy loam, loam, or sandy clay loam
Rock fragments: 35 percent or more
Effervescence: Violently
Reaction: Moderately alkaline

Studybutte Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Hillslopes, mountain slopes, hills
Parent material: Gravelly residuum weathered from trachyte and/or rhyolite
Elevation: 1,800 to 3,995 feet
Slope: 10 to 45 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, nonacid, hyperthermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Studybutte very gravelly loam, in an area of Studybutte-Rock outcrop complex, 20 to 60 percent slopes; Brewster County, Texas; Tule Mountain, Texas USGS topographic quadrangle; Latitude: 29 degrees, 21 minutes, 55.678 seconds North; Longitude: 103 degrees, 27 minutes, 24.712 seconds West; NAD83; UTM Easting: 649779 m, UTM Northing: 3249467 m, Zone 13.

A1—0 to 3 inches; reddish brown (5YR 5/3) very gravelly loam, dark reddish brown (5YR 3/3) moist; weak medium granular structure; friable, hard, slightly sticky, slightly plastic; common fine roots; 50 percent igneous gravel; noneffervescent; slightly alkaline; clear smooth boundary.

A2—3 to 6 inches; reddish brown (5YR 5/3) extremely gravelly loam, dark reddish brown (5YR 3/3) moist; weak medium granular structure; friable, hard, slightly sticky, slightly

plastic; common fine roots; 70 percent igneous gravel; very slightly effervescent; slightly alkaline; abrupt irregular boundary.

R—6 to 16 inches; indurated trachyte bedrock.

A horizon

Hue: 5YR to 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4 dry or moist
Texture: Fine sandy loam or loam
Clay content: 5 to 25 percent
Rock fragments: 35 to 80 percent
Effervescence: None to slightly
Reaction: Neutral or slightly alkaline

R layer

Kind: Igneous bedrock
Cementation: Indurated
Fractures: Less than 4 inches apart
Other features: Some pedons have calcium carbonate coats on fracture surfaces

Studybutte Taxadjunct

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately
Landforms: Hills, high hills
Parent material: Gravelly residuum weathered from tuff
Elevation: 1,800 to 3,995 feet
Slope: 5 to 30 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Ustic Torriorthents

Studybutte as used in this mapping unit is a taxadjunct to the series because it is calcareous, strongly effervescent and violently effervescent throughout, and formed over tuff bedrock. The Studybutte series is Loamy-skeletal, mixed, superactive, nonacid, hyperthermic Lithic Ustic Torriorthents.

The Studybutte soils in map unit SUD—Studybutte very gravelly sandy clay loam, 5 to 30 percent slopes, are taxadjuncts to the series because they are calcareous. The Studybutte soils are loamy-skeletal, mixed, superactive, nonacid, hyperthermic Lithic Ustic Torriorthents.

Typical Profile

Typical pedon of Studybutte very gravelly sandy clay loam in an area of Studybutte very gravelly sandy clay loam, 5 to 30 percent slopes; Agua Adentro Mountain, Texas USGS topographic quadrangle; Latitude: 29 degrees, 22 minutes, 56.49 seconds North; Longitude: 104 degrees, 2 minutes, 40.00 seconds West; NAD 83; UTM Easting: 592729 m, UTM Northing: 3250728 m, Zone 13.

A1—0 to 5 inches; brown (10YR 5/3) very gravelly sandy clay loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; very friable, slightly hard, slightly sticky, slightly plastic; 60 percent prominent white (10YR 8/1) dry, carbonate coats on rock fragments; 55 percent igneous gravel; strongly effervescent; slightly alkaline; clear smooth boundary.

A2—5 to 10 inches; pale brown (10YR 6/3) extremely gravelly sandy clay loam, brown (10YR 4/3) moist; weak very fine subangular blocky structure; friable, moderately hard, slightly sticky, slightly plastic; 95 percent prominent white (10YR 8/1) dry, carbonate coats on rock fragments; 70 percent igneous gravel; violently effervescent; slightly alkaline; abrupt smooth boundary.

R—10 to 20 inches; white (10YR 8/1) indurated tuff bedrock, light gray (10YR 7/1) moist; fractures are less than 4 inches apart.

A horizon

Hue: 5YR to 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, loam, or sandy clay loam
Clay content: 15 to 32 percent
Rock fragments: 35 to 80 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline to strongly alkaline

R layer

Kind: Tuff bedrock
Cementation: Indurated
Fractures: Less than 4 inches apart
Other features: Some pedons have calcium carbonate coats on fracture surfaces

Tenneco Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Flood-plain steps
Parent material: Loamy alluvium derived from igneous and sedimentary rock
Elevation: 3,500 to 5,000 feet
Slope: 0 to 3 percent

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Ustic Haplocambids

Typical Profile

Typical pedon of Tenneco silt loam in an area of Tenneco-Bodecker complex, 0 to 3 percent slopes, flooded; Puerto Potrillo, Texas USGS topographic quadrangle; Latitude: 29 degrees, 49 minutes, 36.25 seconds North; Longitude: 103 degrees, 58 minutes, 13.79 seconds West; NAD 83; UTM Easting: 599468 m, UTM Northing: 3300031 m, Zone 13.

A—0 to 3 inches; brown (10YR 4/3) silt loam, very dark brown (10YR 2/2) moist; weak thin platy structure; slightly hard, friable, slightly sticky, slightly plastic; strongly effervescent; moderately alkaline; abrupt smooth boundary.

Bw—3 to 28 inches; brown (10YR 4/3) silt loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; strongly effervescent; moderately alkaline; abrupt wavy boundary.

Bk–28 to 80 inches; brown (10YR 4/3) gravelly clay loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; hard, firm, sticky, plastic; 20 percent igneous gravel; violently effervescent; moderately alkaline.

A horizon

Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: Silt loam or sandy clay loam
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bw horizon

Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: Loam, silt loam, sandy loam, sandy clay loam, or clay loam
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bk and C horizons

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 2 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, loam, sandy clay loam, or clay loam
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Terlingua Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately rapid
Landforms: Hillslopes, mountain slopes, high hills
Parent material: Gravelly residuum and/or colluvium derived from basalt
Elevation: 1,800 to 3,995 feet
Slope: 5 to 60 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Ustic Torriorthents

Typical Profile

Typical pedon of Terlingua very gravelly sandy loam in an area of Terlingua-Rock outcrop complex, 20 to 70 percent slopes; Cerro Redondo, Texas USGS topographic quadrangle; Latitude: 29 degrees, 30 minutes, 38.43 seconds North; Longitude: 104 degrees, 7 Minutes, 35.55 seconds West; NAD 83; UTM Easting: 584655 m, UTM Northing: 3264884 m, Zone 13.

A—0 to 13 inches; very pale brown (10YR 7/3) very gravelly coarse sandy loam, brown (10YR 5/3) moist; weak fine granular structure; friable, moderately hard, nonsticky, nonplastic; 45 percent igneous gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.

R—13 to 23 inches; very pale brown (10YR 7/4) hard igneous bedrock, yellowish brown (10YR 5/4) moist; indurated.

A horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: Coarse sandy loam, sandy loam, or loam
Rock fragments: 35 to 70 percent
Effervescence: Slightly to violently
Reaction: Slightly alkaline or moderately alkaline

Bk or Cr horizons (where present)

Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: Coarse sandy loam, sandy loam, or loam
Rock fragments: 35 to 70 percent
Other features: Calcium carbonate accumulations on coarse fragments and in seams.
Effervescence: Slightly to violently
Reaction: Slightly alkaline or moderately alkaline

R layer

Kind: Igneous bedrock
Cementation: Indurated
Hardness: 3 to about 4 on Moh's scale

Verhalen Series

Depth class: Very deep
Drainage class: Moderately well drained
Slowest soil permeability to 60 inches: Very slow
Landforms: Alluvial flats
Parent material: Clayey alluvium derived from igneous and sedimentary rock
Elevation: 3,500 to 5,000 feet
Slope: 0 to 2 percent

Taxonomic Class

Fine, smectitic, thermic Typic Haplotorrerts

Typical Profile

Typical pedon of Verhalen silty clay in an area of Verhalen silty clay, 0 to 2 percent slopes, rarely flooded; Sauceda Ranch, Texas USGS topographic quadrangle; Latitude: 29 degrees, 27 minutes, 19.481 seconds North; Longitude: 103 degrees, 55 minutes, 34.301 seconds West; NAD 83; UTM Easting: 604130 m, UTM Northing: 3258923 m, Zone 13.

A—0 to 7 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; strong fine and medium subangular blocky structure parting to moderate fine and medium granular; very firm, very hard, very sticky, very plastic; strongly effervescent; moderately alkaline; abrupt smooth boundary.

Bss1—7 to 12 inches; dark gray (10YR 4/1) silty clay, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to moderate coarse angular blocky; very firm, very hard, very sticky, very plastic; 35 percent slickensides (pedogenic); strongly effervescent; moderately alkaline; clear smooth boundary.

Bss2—12 or 33 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse angular blocky structure; very firm,

very hard, very sticky, very plastic; 30 percent slickensides (pedogenic); strongly effervescent; moderately alkaline; gradual smooth boundary.

Bss3—33 to 54 inches; very dark grayish brown (10YR 3/2) silty clay, very dark brown (10YR 2/2) moist; weak medium and coarse angular blocky structure; very firm, very hard, very sticky, very plastic; 30 percent slickensides (pedogenic); strongly effervescent; moderately alkaline; gradual smooth boundary.

2BC—54 to 64 inches; dark grayish brown (10YR 4/2) extremely gravelly clay, very dark grayish brown (10YR 3/2) moist; very firm, very hard, very sticky, very plastic; 20 percent distinct white (10YR 8/1) dry, carbonate coats on rock fragments; 15 percent angular basalt gravel and 50 percent subangular basalt gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

3BC—64 to 67 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; weak medium and coarse angular blocky structure; very firm, very hard, very sticky, very plastic; strongly effervescent; moderately alkaline; clear smooth boundary.

3BCk—67 to 80 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; weak medium angular blocky structure; very firm, very hard, very sticky, very plastic; 1 percent fine threadlike extremely weakly cemented white (10YR 8/1) dry, carbonate masses; strongly effervescent; moderately alkaline.

A horizon

Hue: 5YR to 10YR
Value: 4 or 5 dry, 3 moist
Chroma: 2 to 4, dry or moist
Color features: More than half of each pedon, to a depth of 12 or more inches, has chroma of less than 3 moist or dry
Texture: Clay loam, silty clay, or clay
Clay content: 35 to 60 percent
Rock fragments: 0 to 65 percent; 0 to 25 percent gravel, and 0 to 45 percent cobbles
Effervescence: Slightly or strongly
Reaction: Moderately alkaline

Bss horizon

Hue: 5YR or 7.5YR
Value: 3 to 6 dry, 2 to 3 moist
Chroma: 1 to 4, dry or moist
Texture: Clay loam, silty clay, or clay
Clay content: 35 to 60 percent
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

BC and BCk horizons

Hue: 5YR or 7.5YR
Value: 5 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Clay loam, silty clay, or clay
Clay content: 35 to 60 percent clay
Rock fragments: Mainly none to few fine pebbles, but may contain thin layers that contain up to 65 percent
Calcium carbonate equivalent: 5 to 20 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Vicente Series

Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderately slow
Landforms: Flood plains
Parent material: Loamy alluvium derived from igneous and sedimentary rock
Elevation: 1,800 to 3,995 feet
Slope: 0 to 1 percent

Taxonomic Class

Coarse-silty, mixed, superactive, calcareous, hyperthermic Ustic Torrifluvents

Typical Profile

Vicente loam in an area of Vicente, Lomapelona, and Castolon soils, 0 to 1 percent slopes, occasionally flooded; Redford, Texas USGS topographic quadrangle; Latitude: 29 degrees, 27 minutes, 10.641 seconds North; Longitude: 104 degrees, 12 minutes, 17.972 seconds West; NAD 83; UTM Easting: 577095 m, UTM Northing: 3258533 m, Zone 13.

Ap—0 to 9 inches; light brownish gray (10YR 6/2) loam, brown (10YR 4/3) moist; moderate medium granular structure; very friable, very hard, moderately sticky, moderately plastic; violently effervescent; moderately alkaline; abrupt smooth boundary.

C1—9 to 13 inches; light brownish gray (10YR 6/2) clay loam, brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; very friable, very hard, moderately sticky, moderately plastic; common very fine and fine pores; violently effervescent; moderately alkaline; clear smooth boundary.

C2—13 to 29 inches; light brownish gray (10YR 6/2) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; friable, very hard, slightly sticky, slightly plastic; violently effervescent; moderately alkaline; gradual smooth boundary.

C3—29 to 39 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak medium granular structure; very friable, very hard, slightly sticky, slightly plastic; violently effervescent; moderately alkaline; abrupt smooth boundary.

C4—39 to 49 inches; brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; granular structure; very friable, very hard, slightly sticky, slightly plastic; violently effervescent; moderately alkaline; abrupt smooth boundary.

C5—49 to 80 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; very friable, very hard, slightly sticky, slightly plastic; violently effervescent; moderately alkaline.

A horizon

Hue: 10YR
Value: 3 to 6 dry, 4 moist
Chroma: 2 to 4, dry or moist
Texture: Silt loam, silty clay loam, loam, or clay loam
Clay content: 15 to 35 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

C horizon

Hue: 10YR
Value: 3 to 6, dry or moist
Chroma 2 to 4, dry or moist
Texture: Silt loam, silty clay loam, loam, or clay loam
Clay content: 15 to 35 percent, averages less than 18 percent

Effervescence: Strongly or violently
Reaction: Moderately alkaline

Volco Series

Depth class: Very shallow or shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: Moderate
Landforms: Mesas, hills, dip slopes on cuestas
Parent material: Gravelly residuum and/or colluvium derived from basalt and/or ignimbrite
Elevation: 4,500 to 6,695 feet
Slope: 1 to 8 percent

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Lithic Calciustolls

Typical Profile

Typical pedon of Volco very gravelly loam in an area of Volco and Pardo soils, 1 to 8 percent slopes; Brewster County, Texas; Elephant Mountain, Texas USGS topographic quadrangle; Latitude: 29 degrees, 57 minutes, 44.81 seconds North; Longitude: 103 degrees, 39 minutes, 49.16 seconds West; NAD 83; UTM Easting: 628922 m, UTM Northing: 3315395 m, Zone 13.

A1—0 to 2 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium granular structure; very friable, slightly hard; few very fine roots and few fine roots; 10 percent igneous cobbles and 35 percent igneous gravel; slightly effervescent; moderately alkaline; abrupt smooth boundary.

A2—2 to 5 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; friable, hard; common very fine and common fine roots; 5 percent igneous cobbles and 40 percent igneous gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk1—5 to 11 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; friable, hard; few fine roots; 5 percent igneous cobbles and 50 percent igneous gravel; violently effervescent; moderately alkaline; clear smooth boundary.

Bk2—11 to 18 inches; brown (7.5YR 5/3) very gravelly loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; friable, slightly hard; 10 percent carbonate coats on rock fragments; 5 percent igneous cobbles and 50 percent igneous gravel; violently effervescent; moderately alkaline; abrupt wavy boundary.

R—18 to 28 inches; platy grayish ignimbrite bedrock, indurated; noneffervescent.

A horizon

Hue: 5YR to 10YR
Value: 4 or 5 dry, 3 moist
Chroma: 2 or 3, dry or moist
Texture: Sandy loam, loam, or clay loam
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 5YR to 10YR
Value: 4 or 5 dry, 3 moist
Chroma: 2 or 3, dry or moist
Texture: Loam
Calcium carbonate equivalent: 20 to 35 percent

Secondary carbonate accumulations: Coatings on fragments, threads, films, or masses
Effervescence: Violent
Reaction: Moderately alkaline

R layer

Kind: Igneous bedrock
Cementation: Indurated

Formation of the Soil

In this section, the factors of soil formation are related to the formation of the soils in Presidio County. Also, processes of horizon differentiation and the surface geology of the county are described.

Factors of Soil Formation

Soil is a dynamic medium forming a living shell of varying thickness over the rocky crust of the Earth. Soil, as used in this publication, is a natural body or a collection of natural bodies on the earth's surface, containing living matter and supporting or capable of supporting plant life. Its upper limit is air or shallow water. At its margins it grades to deep water or to barren areas of rock. Soil grades at its lower limit to bedrock or to earthy materials virtually devoid of roots, animals, or marks of other biologic activity (USDA, 1998; USDA, 1999).

Soil is the result of the interaction of five soil forming factors (Birkeland, 1984; Jenny, 1941). These factors determine the unique properties and characteristics of a soil at any given location. The five soil forming factors are: (1) the type and mineralogical composition of the parent material; (2) the living organisms on and in the soil; (3) the topography or relief features of a landscape; (4) the different climates that the soil has been exposed to; and (5) the length of time these development forces have acted upon the soil. The interrelationship of these factors is very complex and it is difficult to isolate the effects of any one factor. The effect of the factors also varies from place to place, but the interaction of the factors ultimately determines the kind of soil that forms. The term "pedogenesis" (soil genesis) is often used to connote the process of soil formation.

Parent Material

Parent material is the unconsolidated organic and mineral matter in which soil forms. Parent materials influence or wholly determine the color, texture, mineralogy, structure, consistency, reaction, erodibility, and natural fertility of soil.

Most mineral matter is ultimately derived from some type of rock. The survey area contains several types of bedrock. This includes igneous, limestone, and conglomerate with lesser amounts of other sedimentary rocks. Similar types of bedrock are grouped together into units called formations. Physical and chemical weathering of rocks in these exposed geologic formations, accompanied by natural erosion, provides an abundant source of loose rock debris for the parent materials of soils.

Since the parent materials derived from particular geologic formations have specific characteristics, the soils that form in them tend to also have specific characteristics that are related to or derived from these materials. Certain properties such as mineralogy and soil color are strongly influenced by the initial nature of the parent materials. Such properties are especially evident in dry regions where the rate of chemical alteration of most minerals is slow because of the lack of abundant soil moisture.

The soils in Presidio County formed in several types of parent material. The parent materials present include alluvium, colluvium, lacustrine, and residuum material. Each of these materials is discussed in the following paragraphs.

Alluvium is sediment that has been moved by water. It may have been moved many miles or only a few feet. Alluvial deposits are typically stratified because of the fluctuating nature of the processes involving erosion, transportation, and deposition of sediments. This inherent stratification is clearly evident in very young alluvial deposits, but is less

evident in deposits where pedogenesis has altered or obscured it. Differences in particle or grain sizes because of stratification play an important role in the diagnostic horizons that may form in a soil. For example, calcic horizons in soils commonly form over or within layers having distinct differences in grain size. This effect is because of the change in the size of the pores from one strata or layer to the next, which affects water flow. These different layers slow the movement of soil water and allow compounds such as calcium carbonate held in suspension to be withdrawn into large soil pores where they accumulate over time. Common landforms in this survey area where alluvium is a dominant parent material are flood plains, alluvial fans, fan remnants, and stream terraces. Corazones, Murray, and Vicente are examples of soils formed from alluvium.

Colluvium is material that has been moved down steep slopes by mass wasting processes. It is composed of material that has rolled, slid, or fallen down slope because of the influence of gravity. The size fractions of particles in most colluvial deposits are large and the material is unsorted. The rock fragments in colluvium are usually angular, except where the fragments are derived from rock formations or unconsolidated deposits that have preexisting, rounded fragments. Most often, colluvium is an important soil parent material on side slopes. Ohtwo is an example of a soil formed from colluvium.

Lacustrine material is generally fine-grained sediment that was deposited in shallow water or lakes and contains few coarse fragments. It often consolidates into shale or mudstone and weathers into clayey soils. In this survey area it occurs as old lakebed sediments that have been dissected as the Rio Grande River has down cut and drained the area. Geefour is an example of a soil formed from lacustrine deposits.

Residuum is material formed in place by the physical and chemical weathering of bedrock. Soils formed from residuum often are shallow to bedrock and contain many rock fragments. Common landform positions in this survey where residuum contributes to the soil material are mountains, hills, and escarpments. Brewster, Pantak, and Studybutte are examples of soils formed from residuum.

Climate

Climate plays an important role in the formation of soils. Climate is a dynamic factor that fluctuates diurnally, monthly and yearly in the mid-latitudes in response to the seasons. It has also undergone significant global changes over the long span of geologic time. A change in climate alters the balance of other soil forming factors, and soils often display morphologic features that formed under the influence of past climates. Many soils in dry regions which have argillic horizons overlying well developed calcic horizons probably display the effects of former climates. The early Holocene epoch was a time of continent-wide climatic change where increasingly arid conditions, especially in the western parts of the United States, caused additions of calcium carbonate to engulf the argillic horizons of many soils (Gile, 1981).

A wide range of soil temperature and moisture regimes exist within this survey area. Soil temperature regimes in the survey area range from thermic at high and middle elevations to hyperthermic at the lower elevations along the Rio Grande River. Temperature affects evaporation rates, the rate of biological activity, the rate of decomposition of organic matter, and the rate of certain chemical reactions. Within these temperature regimes, rates of many processes can effectively double for every 10 degree C. rise in temperature (Brady, 1974).

Regional and local weather patterns determine when, what types, and in what amounts precipitation will fall. Presidio County has a distinct pattern of precipitation with significant amounts of moisture coming in summer. Moisture coming in the winter in the form of snow and gentle rain avoid high rates of evaporation and can penetrate deeply into soil profiles. Spring months are normally dry and windy with little rainfall. The strong spring winds intensify the dry climate and deplete soil moisture through high evaporation rates. Moisture coming in summer, when evapotranspiration rates are high, usually does not penetrate deeply into the soil. Summer moisture typically comes as heavy rainfall

from high-intensity thunderstorms of short duration. These summer monsoon storms, occurring between July and September, are isolated in extent and undependable in occurrence. Much of the moisture that falls from such high intensity storms runs off the soil surfaces and is unavailable for plant growth.

Soil moisture affects the types of native vegetation present, the rate of biologic activity, the rate of leaching of chemical compounds, and the degree of illuviation of soil colloids. Within certain limits, increasing amounts of soil moisture will result in greater soil development by increasing the amounts and rates of processes acting upon it.

Plant and Animal Life

Plant, animal, and microbial life affect many soil processes such as the physical and chemical weathering of bedrock and parent material, the rates of organic matter decomposition and biochemical transformation, and plant nutrient cycling. Plant roots grow into cracks in bedrock and parent material, breaking it loose into individual particles and exert strong pressures to force open joints in rock and unconsolidated materials, making them more porous. Organic matter is incorporated into the soil solum through root growth and death and also provides organic mulch at the soil surface by plant litter. In ecosystems with poor soil nutrition or low available moisture, plants can cycle nutrients from great depths or pull water from relatively dry materials in the soil, making them available to other plants and animals.

Animals have an impact on soil formation. Creatures such as ants, earthworms, cicada larvae, mice, moles, prairie dogs, and badgers live and burrow in the soil. Their activities mix layers and concentrate soil particles, while also increasing porosity, permeability, and recycling plant matter and nutrients. Certain soil bacteria participate symbiotically with plants in the basic enzymatic transformations of nitrification, and nitrogen fixation and are responsible for reduction and oxidation processes that induce sulfur oxidation, iron mobilization, and many other biochemical and geochemical transformations in the soil (Brady, 1974). Actinomycetes are bacteria-like fungi that are of great importance in the decomposition of soil organic matter and are also partly responsible for the aroma of fresh soil. Certain species of fungi may aid or speed the accumulation of calcium carbonate within desert soils (Monger et al, 1991).

Field research by ecologists is revealing the importance that algae and spore producing plants play in the health and stability of fragile soils in dry regions. Cryptogamic soil crusts form on and directly under the soil surface when symbiotic communities of algae, fungi, mosses, and lichens flourish. These crusts are characteristically dark and lumpy and can become well developed on sandy, saline, or gypsiferous soils which lack gravel lags or desert pavements. Cryptogamic crusts are important because they provide surface aggregation that stabilizes and protects otherwise sparsely vegetated soils from the hazards of water erosion and soil blowing (Anderson et al, 1982; Brotherson et al, 1983). Other benefits which cryptogam crusts provide is adding organic matter, fixing atmospheric nitrogen, increasing water infiltration, and protecting moisture within the upper inch of soil (Dunne, 1989).

Humans alter the soil by building structures, manipulating rangeland plants for livestock, harvesting or chaining trees, and by leveling, tilling, planting, and irrigating for crop production. Overgrazing by livestock and other animals can increase the amount of bare ground and soil compaction. All of these activities can increase the potential for soil erosion and ecosystem degradation if land users are not careful to practice good management and soil conservation techniques.

Relief

Topography has an important influence on soil formation, due both to slope gradient and aspect. Slope gradient determines the rate of surface runoff and the hazard of soil erosion by water as well as the internal drainage of soils. As percent slope increases, surface runoff also increases and water infiltration decreases. This leads to an increased

hazard of water erosion and a decrease in weathering of the parent material, resulting in less soil development.

The aspect, or direction a slope faces, can also affect soil formation. In the northern hemisphere, steep north-facing slopes have cooler, more moderate temperatures and more effective soil moisture than steep south-facing slopes.

Time

The length of time that parent materials have been exposed to the effects of climate and living organisms is an important factor in soil development. Soil age is the measure of this length of time and is important in identifying soil properties and characteristics. In general, the longer duration of time that a soil has been forming, the stronger degree of expression its diagnostic horizons will have.

The development of carbonate (Bk and Bkkm) horizons of pedogenic origin is a common occurrence in the survey area and is closely related to soil age (Gile et al, 1981). The formation of Bk horizons can be divided into several identifiable and differentiable stages of maturity of which qualitative and sometimes quantitative age distinctions can be made between soils. This is often a useful and important tool in identifying landform types and positions. Boracho, Paisano, and Ojinaga soils are examples of soils with developed Bkkm horizons.

Another indication of soil development is an accumulation of clay in the subsoil. 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 (Bt) horizon. Berrend, Pantak, and Musquiz are examples of soils with argillic (Bt) horizons.

Processes of Horizon Differentiation

This section describes the processes of soil formation, and relates the processes to the soils of Presidio County, Texas.

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 (Simonson, 1959). These processes include additions or losses of organic, mineral, and gaseous materials to the soil, transfers of material from one location within the soil to another, and physical and chemical alteration 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 downward 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.

Soil profiles in Presidio County have four major horizons or layers. These are the A, B, C or R. Some soils do not have B or C horizons. In Presidio County, the main processes are leaching of calcium carbonate and bases, accumulation of organic matter, and formation, eluviation, and illuviation of silicate clay minerals, accumulation of sodium. In most soils, more than one of these processes has been active in the development of the horizons.

The A horizon is the surface layer. It is the horizon that has the maximum accumulation of organic matter. The soils of Presidio County range from low to medium in organic matter content. Organic matter has accumulated, partially decomposed, and been incorporated into the soil. The accumulation of organic matter in soils is greatest in and above the surface layer. Many of the more stable products of organic matter decomposition remain as finely divided materials that result in darker colors, increased water-holding and cation-exchange capacities, and granulation of the soil. Very shallow

soils, such as Bissett and Blackgap can have relatively high organic matter content even in quite dry environments because the organic material is confined to a comparatively small volume of mineral material. Organic matter accumulation is related to amount of plant growth (followed by death and decomposition) supported by the soil. The type of vegetation affects the amount of organic matter accumulation.

The B horizon is the subsoil. It is usually directly below the A horizon. It is the horizon that has the maximum accumulation of dissolved or suspended materials, such as clay, calcium carbonates, and iron. It may also be an altered horizon that has a distinctly different structure than that of the A horizon but shows little evidence of clay translocation or accumulation.

A B horizon that has a significant amount of clay accumulation is called a Bt horizon. Clay accumulates in horizons largely because of translocation from upper to lower horizons. As water moves downward, it can carry small amounts of clay in suspension. This clay accumulates at depths penetrated by water. It accumulates in fine pores in the soil and as clay films on surfaces of peds. Over long periods of time, at least a few thousand years, such processes can result in distinct horizons. Process of clay translocation requires wetter climate or long periods of geologic time. The Berrend, Costavar, Eppenauer, Marfa, Musquiz, Nolam, Quadria, and Pantak soils have strongly expressed Bt horizons.

A B horizon that has distinct structure or color development with little significant evidence of clay, lime, or sodium accumulation is called a Bw horizon. Plant roots and other organisms contribute to the rearrangement of soil materials into secondary aggregates. Organic residues and secretions of organisms serve as cementing agents that help stabilize structural aggregates. Soils that have appreciable amounts of clay develop structural aggregates because of drying and wetting and because of shrinking and swelling. Nillo, Phantom, Sanmoss, and Verhalen soils have Bw horizons.

Processes that result in development of soil structure have occurred in most of the mineral soils. Plant roots and other organisms contribute to the rearrangement of soil material into secondary aggregates. The decomposition products of organic residue and the secretions of organisms serve to help stabilize structural aggregates. Alternate wetting and drying as well as shrinking and swelling contribute to the development of structural aggregates and are particularly effective in soils that have appreciable amounts of clay. Consequently, soil structure is typically most pronounced in the surface horizon, which contains the most organic matter, and in clayey horizons that alternately undergo wetting and drying.

Another important process in soil formation is the loss of components from the soil. Water can leach many soluble components, such as calcium carbonate, to the lower horizons in the profile. A horizon that has a significant accumulation of calcium carbonate is designated by the addition of the symbol "k." Berrend, Bissett, Blackgap, Boludo, Boracho Borunda, Chilicotal, Chilimol, Corazones, Decoty, and Eppenauer soils are examples of soils that have accumulations of calcium carbonate in the lower horizons.

Some soils have a cemented layer of calcium carbonate, known locally as caliche. The same process that formed the Bk horizons also formed the Bkkm horizon. In Presidio County, Bkkm horizons of the Boracho, Manzanillo, Ojinaga, Paisano, Pardo, and Strawhouse soils that occur on high, stable geomorphic surfaces have resulted from exposure to soil-forming processes over extended periods of geologic time.

The morphology of sodium affected soils is evident in Presidio County. These layers are identified as Bn horizons. Laboratory data demonstrating dominance of sodium is available for soils from Presidio County. Gemelo and Straddlebug soils have Bn horizons.

BC and CB horizons have properties of both B horizons and C horizons. BC are dominated characteristics of the B horizon, but exhibit some properties of the C horizon, whereas CB horizons are mostly unaffected by soil forming processes, but show some evidence of alteration. Boracho, Butcherknife, Holguin, Melado, and Verhalen.

The C horizon is relatively unchanged by soil-forming processes, although in some places it is modified by weathering. It is generally below the B horizon. In some alluvial sediments near streams, rivers, and bays, the C horizon is directly below the A horizon. Baviza, Berrend, Castolon, Lomapelona, Nillo, Reduff, Sanmoss, and Bodecker soils have C horizons.

The R horizon is unweathered bedrock under the soil material. Examples of these are limestone, sandstone, basalt, rhyolite, and tuff. Minerals in the bedrock influence soil properties and horizons.

Surface Geology

Prepared by Lynn E. Loomis, USDA-Natural Resources Conservation Service

Rocks exposed at the surface within the boundaries of Presidio County range in geologic age from Late Cambrian to Holocene, from about 510 million years in age to less than 10,000 years. Presidio County occurs on 3 sheets of the Geologic Atlas of Texas: Marfa, Fort Stockton, and Emory Peak-Presidio. According to the Geologic Atlas of Texas (Dietrich et al, 1966) some 81 named geologic map units or formations are mapped within the bounds of Presidio County. The Geologic Map of Texas (Barnes, 1992; Stoeser and others, 2005) which was compiled at 1:500,000 scale combined these into 62 named geologic map units.

The rocks in Presidio County originated by igneous and sedimentary processes. Important rock types include rhyolite, basalt, tuff, limestone, mudstone, and sandstone, as well as gravelly sediments and nongravelly sediments. This diverse lithology is further complicated by many normal faults that place rocks of different age and lithology side-by-side on the land surface. The geologic formations have been arranged into five groups defined by geologic time and general lithology: Paleozoic rocks, Lower Cretaceous limestone, Upper Cretaceous rocks, Tertiary volcanic rocks, and Quaternary age surficial deposits.

Paleozoic Rocks

Paleozoic rocks occur at the surface on less than 20,000 acres, mostly within the Solitario; they are minor in extent. Rocks exposed at the surface in the Solitario range in age from Cambrian to Pennsylvanian (McBride, 1988). They have a total thickness of from 16,000 to 21,000 feet. The initial stages of deposition within a marine environment, from Cambrian to Mississippian, occurred slowly. Only 3,100 feet of sediments were deposited during a time span of 170 million years (McBride, 1988). Dagger Flat sandstone (Cambrian) is parent material for Coyanosa soils. Ordovician age formations include the Marathon, Fort Pena, Alsate, and Woods Hollow. Residuum weathered from limestone, sandstone, and shale bedrock in these formations is parent material for Bissett, Coyanosa, and Buckear soils, respectively. Chert of the Ordovician age Maravillas Formation and novaculite of the Mississippian and Devonian age Caballos Formation serve as parent material for Catto soils. The Caballos novaculite is very similar in geologic age and composition to the Arkansas novaculite, which is famous as superior whetstone for sharpening edges. Rocks of Pennsylvanian age and older were extensively folded and faulted during the Ouachita orogeny. Many high-relief folds occur within the Solitario.

The Pennsylvanian and Permian age formations (Ross Mine, Mina Grande, Pinto Canyon, Alta, and Cibolo) form a discontinuous ring that partially encircles the Chinati Mountains. These formations are composed mainly of limestone.

Lower Cretaceous Limestone

The Cretaceous rocks of eastern Presidio County were laid down mainly in a shallow marine environment (Diablo Platform) whereas those in western part of the county were deposited in a deep marine setting (Chihuahua Trough). Rocks deposited during the

Lower Cretaceous period within present-day eastern Presidio County are almost entirely limestone (Henry and Muehlberger, 1996). The Glen Rose, Santa Elena, Sue Peaks, Del Carmen, and Buda Formations in eastern Presidio County compose a sequence of carbonate rock about 2,500 feet thick. Lower Cretaceous rocks in western Presidio County include the Shafter, Bluff Mesa, Yucca, Presidio, Benavides, Cox, and Finlay Formations.

Upper Cretaceous Rocks

Upper Cretaceous rocks in eastern Presidio County include the Del Rio, Buda, Boquillas, and Pen Formations, whereas the El Picacho, San Carlos, and Ojinaga Formations outcrop in western Presidio County. Upper Cretaceous rocks are composed of mudstone, flaggy limestone, and sandstone.

Thick-bedded limestone bedrock is the source of residual parent material for the Bissett and Blackgap soils, and contributes alluvium which is parent material for the Strawhouse and Stillwell series. Flaggy limestone of the Boquillas Formation weathers to form soils of the Mariscal series. Geefour soils formed in mudstone and shale of the Del Rio, Pen, Ojinaga, and El Picacho Formations.

At the end of the Cretaceous period, shallow seas began to withdraw from West Texas. The Laramide orogeny significantly influenced the rocks and landscapes of Presidio County. Compressional forces during the Late Cretaceous and early Tertiary created uplifts, basins, faults, and folds in a zone extending from Mexico to Canada. Thrust faults during this period formed the mountain ranges immediately west of the Rio Grande in Mexico. Tascotal Mesa Fault in Presidio County lies within the Trans-Pecos Volcanic province, a large area of volcanic, volcaniclastic, and intrusive rocks deposited during Eocene and Oligocene epochs (Parker, 1988; Price and others, 1986). Volcanic vents at least partially within Presidio County include the Chinati Mountains, Infernieto caldera, Paisano Pass, and the Solitario Dome calderas, as well as several vents on the Bofecillos Plateau. Volcanoes in adjacent counties that shed lava or volcanic sediments to Presidio County include Pine Canyon and Sierra Quemada calderas (Brewster County) Buckhorn and Muerto calderas (Jeff Davis County) Wylie Mountains and Van Horn calderas (Culberson County) and Eagle Mountains and Quitman Mountains calderas (Hudspeth County). The San Carlos and Santana calderas erupted just south of the Rio Grande in Chihuahua, Mexico. The Trans-Pecos volcanic province is part of larger area of volcanic activity that formed the Sierra Madre Occidental in Mexico and Mogollon-Datil mountains in western New Mexico.

Tertiary Volcanic Rocks

The succession of Tertiary volcanic rocks in Presidio County is 3,000 to 4,000 feet thick, and consists of basalt, rhyolite, ignimbrite, and volcanic sediments. Individual basalt flows are usually thin (some flows are only 3 to 6 feet thick) whereas the rhyolitic units can be as much as several hundred feet thick. Volcaniclastic sediments include reworked air-fall or ash-flow tuff, mudstone, sandstone, and conglomerate.

Relatively small areas of intrusive rocks occur in Presidio County. These are mainly syenite with some granitic rocks.

Outcrops of Chisos tuff in far southeastern Presidio County resulted from eruption of the Pine Canyon caldera in present-day Big Bend National Park in southern Brewster County, Texas.

Cienega Mountain Volcanic Rock Formation

Within the Eocene-Oligocene age Duff, Pruett, and Devils Graveyard Formations are a number of volcaniclastic rock types (Goldich and Elms, 1949) resulting from eruptions that occurred north and west of Presidio County. Tuffaceous bedrock weathers to form the Reduff and Scotal soils, whereas Holguin soils developed in conglomerate. Weathering of tuffaceous mudstone, exposed in Green Valley, produced the parent

material for the Borunda and Musgrave series. Chilicotal, Straddlebug, Nillo, and Quadria soils formed in Holocene age alluvium derived from tuff.

A similar sequence of volcanic and volcaniclastic rocks occurs in western Presidio County. The Vieja group consists of the Jeff conglomerate, Gill breccia, Colmena Formation, Buckshot ignimbrite, Chambers Formation, Bracks rhyolite, and Capote Mountain Formation (DeFord and Bridges, 1958). The Colmena, Chambers, and Capote Mountains Formations consist mainly of tuffaceous sedimentary rocks. The Buckshot and Bracks Formations are rhyolitic in composition.

The Mitchell Mesa ignimbrite resulted from the cataclysmic eruption of the Chinati super volcano in present-day Presidio County about 31 million years ago (Mason, Pyle, and Oppenheimer, 2004). The Mitchell Mesa Formation is characterized by grey to pink rhyolite; angular clear quartz and blue feldspar crystals commonly protrude above the weathered rock surface. The ignimbrite ranges from 40 to 150 feet thick and effectively caps the highlands that surround Green Valley in east-central Presidio County. In places, the erosional scarp held up by the Mitchell Mesa is more than 1,000 feet high. Soils of the Pardo, Volco, Sauceda, and Boludo series formed in residuum derived from ignimbrite bedrock.

Bofecillos volcano volcanic rocks consist mainly of basalt and trachyte. Bofecillos, Studybutte, and Terlingua soils developed from these materials.

Tuffaceous sediments of the Tascotal, San Carlos, Fresno, and Santana Formations weather to form sandy loam textured Holguin soils in the Desert Grassland vegetative zone and Studybutte soils in the Hot Desert Shrub vegetative zone. Tascotal Formation was deposited during the initial stages of dissection of Chinati Volcano. Zeolitic mineralogy with very high cation exchange capacity is found in there formations.

Oligocene age Perdiz conglomerate resulted from the erosion of Chinati Volcano following its catastrophic eruption. The Perdiz consists of alluvial fan deposits, cemented by silica during deposition. Soils of the Chinati, Manzanillo, and Redford series formed in residuum derived from silica-cemented conglomerate.

Quaternary Age Surficial Deposits

In post-volcanic events, extensional faulting during Miocene and Pliocene epochs created the Basin and Range landscapes that characterize Far West Texas. The Miocene age Tarantula gravel occurs in western Presidio County. It is a piedmont slope gravel deposited after about 2,000 feet of vertical offset occurred along the Rim Rock Fault (DeFord and Bridges, 1958).

Closed basins, perhaps similar to Salt Basin in Culberson County, Texas existed in Presidio County until external drainage was established by the Rio Grande about 2 million years ago. Saline bolson fill deposits of clayey texture were deposited in the Presidio and Redford bolsons by an ancient Rio Conchos (Groat, 1972). Soils of the Geefour series formed in residuum weathered from gypsum-bearing clayey bolson fill deposits. Holocene age, highly-saline alluvium derived from clayey bolson-fill deposits is parent material for the Melado soils.

The Rio Grande integrated closed basins thousands of years ago. Following the establishment of external drainage, erosion has been the dominant geomorphic process in Presidio County. In Big Bend National Park, erosion has removed from 2,000 to 10,000 feet of material since the end of the Cretaceous (Udden, 1907). The eroded material was transported by the Rio Grande and deposited along the margins of the Gulf of Mexico. The Catahoula Formation of the Gulf Coastal Plain traces its origin to in part of the Trans-Pecos volcanic field.

Surficial deposits consist of colluvium, pediment-capping gravel deposits, stream and river alluvium, and alluvial-fan deposits. Surficial deposits are mostly of Quaternary age (Albritton and Bryan, 1939) and cover much of Presidio County. The sediments contain records of dramatic climate change during the Pleistocene and Holocene epochs. Furthermore, they are important sources of soil parent materials. Typically soils that

formed in such transported parent materials are deeper and more productive than those forming in residuum derived from bedrock. Chilicotal, Corazones, and Ojinaga soils are examples.

Except for coppice mounds beneath shrubs in some areas, parent materials of eolian (windblown) origin are probably not significant in Presidio County. Soils that formed in colluvium derived from igneous bedrock include the Ohtwo series. Remnants of pediment and alluvial fan deposits of mid to late Pleistocene age occur throughout Presidio County. Soils that formed in gravelly deposits include the Boracho, Espy, Chilicotal, Paisano, Corazones, Quadria, Strawhouse, and Stillwell series. Nongravelly pediment deposits contribute to the parent material of Murray, Musquiz, Martillo, Butcherknife, and Verhalen soils. Soils that formed in younger gravelly alluvial fan deposits include the Sanmoss and Medley series.

Vicente, Lomapelona, and Castolon soils formed in Holocene age nongravelly alluvium deposited on the Rio Grande flood plain. Nongravelly materials deposited on alluvial flats and flood plains of tributary streams serve as parent material for the Straddlebug and Nillo soils. Pantera and Bodecker soils formed in gravelly alluvium deposited on flood plains of tributary streams.

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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.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases) or both, that plant growth is restricted.

Alluvial fan. A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

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.

Arroyo. The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

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.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

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.

Breaks. A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

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.

Butte. An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

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.

Canyon. A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

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.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

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.

Cement rock. Clayey limestone used in the manufacture of cement.

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.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. See Redoximorphic features.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

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."

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.

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.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

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.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion pavement. A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further 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.

Fan remnant. A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

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*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

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 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.

Foothills. A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

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.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

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.

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.

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.

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 vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

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 vegetation 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.)

Landslide. A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

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 1/10bar 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.

Mass movement. A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

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.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

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).

Mountain. A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range. Mountains are

formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

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.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. 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.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

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.

Plateau (geomorphology). A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

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.

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, savannas, 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 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.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

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.

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.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

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

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.

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 10. 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
Very steep	45 percent and higher

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.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases) or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na+ to Ca ++ + Mg++. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

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).

Substratum. See Underlying material.

Subsurface layer. Any surface soil horizon (A, E, A2, A3, A4) below the surface layer.

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.

Talus. Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace (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.

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.

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

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

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 in the period 1971-2000 at Candelaria, Texas)

Month	Temperature (Degrees F)						Precipitation (Inches)			
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have: Maximum temperature higher than	2 years in 10 will have: Minimum temperature less than	Average number of growing degree days*	Average	2 years in 10 will have: less than	2 years in 10 will have: more than	Average number of days w/0.1 or more
	˚F	˚F	˚F	˚F	˚F	Units	In	In	In	
January----	66.4	31.4	48.9	82	14	61	0.32	0.00	0.55	0
February---	73.0	35.1	54.0	88	17	146	0.32	0.00	0.55	1
March------	80.8	40.4	60.6	95	22	330	0.20	0.01	0.33	0
April------	88.6	47.1	67.9	101	28	532	0.39	0.00	0.47	0
May--------	95.9	56.0	75.9	107	40	803	0.74	0.18	1.21	1
June-------	101.5	64.7	83.1	112	49	977	1.97	0.49	3.18	3
July-------	99.6	67.6	83.6	110	59	1,038	2.15	1.02	3.29	4
August-----	97.2	65.6	81.4	107	55	970	2.48	1.31	3.55	4
September--	92.8	61.0	76.9	104	45	804	2.38	0.67	3.91	4
October----	85.4	49.7	67.6	99	31	535	1.20	0.07	2.21	2
November---	74.3	37.6	56.0	89	20	204	0.36	0.00	0.75	1
December---	66.5	31.7	49.1	82	14	64	0.51	0.02	0.87	1
Yearly:										
Average	85.2	49.0	67.1	---	---	---	---	---	---	---
Extreme	115	6	---	112	12	---	---	---	---	---
Total	---	---	---	---	---	6,465	13.02	9.36	15.88	21

*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 in the period 1971-2000 at Candelaria, 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--	March 25	April 9	April 16
2 years in 10 later than--	March 14	March 30	April 8
5 years in 10 later than--	February 21	March 11	March 25
First freezing temperature in fall:			
1 year in 10 earlier than-	November 10	November 1	October 17
2 years in 10 earlier than	November 16	November 6	October 23
5 years in 10 earlier than	November 27	November 15	November 4

Table 3.--Growing Season

(Recorded for the period 1971-2000 at Candelaria, 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	243	214	190
8 years in 10	254	226	202
5 years in 10	277	248	223
2 years in 10	299	270	245
1 year in 10	311	281	256

Table 4.--Temperature and Precipitation

(Recorded in the period 1971-2000 at Marfa 2, Texas)

Month	Temperature (Degrees F)						Precipitation (Inches)			
				2 years in 10 will have				2 years in 10 will have		
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than	Minimum temperature less than	Average number of growing degree days*	Average	less than	more than	Average number of days w/0.1 or more
	˚F	˚F	˚F	˚F	˚F	Units	In	In	In	
January----	59.8	26.0	42.9	76	7	13	0.42	0.08	0.71	1
February---	65.0	28.7	46.9	81	9	39	0.47	0.03	0.76	1
March------	71.6	34.2	52.9	87	15	137	0.25	0.01	0.42	0
April------	78.5	41.0	59.8	91	23	306	0.71	0.03	1.19	1
May--------	85.8	50.5	68.2	98	36	563	1.40	0.53	2.20	3
June-------	91.7	57.9	74.8	103	46	738	1.69	0.57	2.76	4
July-------	89.6	60.4	75.0	100	54	773	2.83	1.23	4.22	5
August-----	87.6	59.3	73.4	99	52	727	2.76	1.40	4.11	5
September--	83.6	54.4	69.0	95	40	569	3.02	1.04	4.40	5
October----	77.4	44.4	60.9	91	26	344	1.51	0.22	2.71	2
November---	67.5	33.3	50.4	82	13	95	0.39	0.03	0.74	1
December---	61.0	27.1	44.0	76	8	19	0.62	0.06	1.04	1
Yearly:										
Average--	76.6	43.1	59.9	---	---	---	---	---	---	---
Extreme--	106	-2	---	104	4	---	---	---	---	---
Total	---	---	---	---	---	4,321	16.07	11.63	19.42	29

*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 in the period 1971-2000 at Marfa 2, 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--	April 4	April 19	April 28
2 years in 10 later than--	March 29	April 14	April 23
5 years in 10 later than--	March 16	April 4	April 13
First freezing temperature in fall:			
1 year in 10 earlier than-	October 26	October 18	October 14
2 years in 10 earlier than	November 2	October 25	October 20
5 years in 10 earlier than	November 14	November 7	October 30

Table 6.--Growing Season

(Recorded for the period 1971-2000 at Marfa 2, 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	214	190	177
8 years in 10	223	198	185
5 years in 10	241	215	199
2 years in 10	259	231	213
1 year in 10	269	240	220

Table 7.--Temperature and Precipitation

(Recorded in the period 1971-2000 at Presidio, Texas)

Month	Temperature (Degrees F)						Precipitation (Inches)			
				2 years in 10 will have				2 years in 10 will have		
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than	Minimum temperature less than	Average number of growing degree days*	Average	less than	more than	Average number of days w/0.1 or more
	˚F	˚F	˚F	˚F	˚F	Units	In	In	In	
January----	68.9	34.4	51.7	84	15	106	0.31	0.00	0.52	1
February---	75.4	39.4	57.4	90	22	220	0.46	0.00	0.69	0
March------	83.2	45.7	64.5	96	29	439	0.15	0.00	0.14	0
April------	90.5	53.6	72.1	102	35	646	0.38	0.00	0.49	0
May--------	97.5	63.2	80.3	108	47	924	0.66	0.08	1.18	1
June-------	102.3	71.5	86.9	111	59	1,091	1.41	0.31	2.40	2
July-------	100.7	73.7	87.2	111	65	1,143	2.01	0.66	3.19	4
August-----	98.8	72.4	85.6	108	63	1,077	1.82	0.88	2.65	4
September--	95.0	66.9	81.0	106	50	913	1.72	0.36	3.05	3
October----	87.6	56.2	71.9	100	36	670	0.99	0.07	1.65	1
November---	77.2	43.1	60.1	91	24	304	0.37	0.00	0.77	0
December---	69.0	35.5	52.2	85	18	119	0.54	0.00	0.95	1
Yearly:										
Average--	87.2	54.6	70.9	---	---	---	---	---	---	---
Extreme--	115	13	---	112	17	---	---	---	---	---
Total	---	---	---	---	---	7,651	10.81	5.82	14.67	17

*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 8.--Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Presidio, 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 21	March 17	April 1
2 years in 10 later than--	February 9	March 5	March 22
5 years in 10 later than--	January 16	February 12	March 3
First freezing temperature in fall:			
1 year in 10 earlier than-	November 29	November 13	November 1
2 years in 10 earlier than	December 7	November 18	November 8
5 years in 10 earlier than	December 23	November 29	November 20

Table 9.--Growing Season

(Recorded in the period 1971-2000 at Presidio, 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	300	253	226
8 years in 10	314	267	238
5 years in 10	347	293	262
2 years in 10	> 365	319	286
1 year in 10	> 365	333	299

Table 10.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
ALB----	Altar-Bodecker-Riverwash association, 0 to 7 percent slopes, flooded-----	33,968	1.4
ANS----	Area not surveyed----------	100,493	4.1
BAC----	Baviza-Pantera complex, 1 to 8 percent slopes, flooded----------	6,940	0.3
BEB----	Berrend and Espy soils, 1 to 5 percent slopes----------	13,548	0.5
BIC----	Bissett-Rock outcrop complex, 1 to 8 percent slopes----------	2,546	0.1
BIE----	Bissett-Rock outcrop complex, 5 to 30 percent slopes----------	13,702	0.6
BIG----	Bissett-Rock outcrop complex, 20 to 70 percent slopes----------	33,163	1.3
BLE----	Blackgap-Rock outcrop complex, 10 to 30 percent slopes----------	4,851	0.2
BLG----	Blackgap-Rock outcrop complex, 20 to 70 percent slopes----------	7,838	0.3
BNE----	Bofecillos-Horsetrap-Rock outcrop complex, 10 to 30 percent slopes-------	27,649	1.1
BNG----	Bofecillos-Rock outcrop complex, 12 to 60 percent slopes----------	27,996	1.1
BOB----	Boracho-Espy complex, 1 to 8 percent slopes----------	14,226	0.6
BOC----	Borunda soils, 1 to 8 percent slopes----------	12,483	0.5
BRD----	Brewster very gravelly loam, 1 to 12 percent slopes----------	40,370	1.6
BRF----	Brewster-Rock outcrop complex, 10 to 30 percent slopes----------	96,127	3.9
BRG----	Brewster-Rock outcrop complex, 20 to 70 percent slopes----------	105,353	4.3
BUD----	Buckear-Coyanosa complex, 5 to 16 percent slopes----------	1,399	*
CAA----	Castolon silty clay loam, 0 to 1 percent slopes, occasionally flooded----	3,201	0.1
CAG----	Catto-Buckear-Rock outcrop complex, 20 to 60 percent slopes----------	2,511	0.1
CIC----	Chilicotal very gravelly fine sandy loam, 1 to 8 percent slopes----------	11,950	0.5
CID----	Chilicotal very gravelly sandy loam, 5 to 16 percent slopes----------	8,196	0.3
CLC----	Chilicotal and Paisano soils, 1 to 8 percent slopes----------	16,360	0.7
CMC----	Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes----------	54,803	2.2
CND----	Chinati-Boracho-Berrend association, 1 to 15 percent slopes----------	106,963	4.3
CNE----	Chinati-Boracho complex, 5 to 20 percent slopes----------	77,421	3.1
COC----	Corazones-Ojinaga complex, 1 to 12 percent slopes----------	121,130	4.9
COE----	Corazones-Ojinaga complex, 10 to 40 percent slopes----------	72,321	2.9
CVC----	Costavar and Volco soils, 1 to 8 percent slopes----------	23,142	0.9
EEB----	Espy-Eppenauer complex, 1 to 5 percent slopes----------	42,194	1.7
GAA----	Galindo clay, 0 to 1 percent slopes, occasionally flooded----------	1,410	*
GEF----	Geefour silty clays complex, 10 to 45 percent slopes----------	1,132	*
GFF----	Geefour-Corazones-Ojinaga association, 5 to 45 percent slopes----------	67,544	2.7
GMF----	Geefour-Melado complex, 5 to 45 percent slopes----------	23,271	0.9
GSA----	Gemelo-Straddlebug complex, 1 to 3 percent slopes----------	19,892	0.8
HOB----	Holguin very gravelly fine sandy loam, 1 to 8 percent slopes----------	15,492	0.6
HOD----	Horsetrap-Bofecillos-Rock outcrop complex, 1 to 12 percent slopes--------	34,132	1.4
KIB----	Kinco gravelly sandy loam, 0 to 3 percent slopes----------	10,031	0.4
LGC----	Lingua very gravelly loam, 1 to 8 percent slopes----------	1,473	*
LIF----	Lingua-Ohtwo complex, 20 to 45 percent slopes----------	402	*
MAE----	Manzanillo and Paisano soils, 1 to 30 percent slopes----------	82,244	3.3
MBE----	Manzanillo-Chilicotal-Holguin association, 1 to 30 percent slopes--------	60,722	2.5
MCA----	Marfa clay loam, 0 to 2 percent slopes, occasionally flooded----------	63,444	2.6
MDE----	Mariscal-Rock outcrop complex, 10 to 30 percent slopes----------	6,619	0.3
MOA----	Martillo and Butcherknife soils, 0 to 3 percent slopes----------	5,525	0.2
MPB----	Melado-Pantera complex, 1 to 5 percent slopes----------	24,464	1.0
MUB----	Murray-Marfa-Boracho association, 1 to 5 percent slopes----------	176,343	7.1
MZA----	Musquiz clay loam, 0 to 3 percent slopes----------	101,408	4.1
NLA----	Nillo silty clay, 0 to 2 percent slopes, occasionally flooded----------	3,243	0.1
NPB----	Nolam and Paisano soils, 1 to 3 percent slopes----------	19,253	0.8
PAC----	Paisano very gravelly fine sandy loam, 1 to 8 percent slopes----------	4,201	0.2
PAD----	Paisano very gravelly fine sandy loam, 5 to 16 percent slopes----------	373	*
PIB----	Paisano-Musgrave association, 1 to 5 percent slopes----------	2,220	*
PKD----	Pantak and Lingua soils, 1 to 16 percent slopes----------	33,433	1.4
PKE----	Pantak and Lingua soils, and Rock outcrop, 10 to 30 percent slopes-------	93,710	3.8
PTA----	Phantom clay loam, 0 to 2 percent slopes, occasionally flooded----------	17,851	0.7
PZB----	Phantom-Musquiz complex, 1 to 5 percent slopes----------	48,577	2.0
QBE----	Quadria, Nolam, and Musgrave soils, 0 to 30 percent slopes----------	1,527	*
RCE----	Redford and Corazones soils, 10 to 30 percent slopes----------	38,255	1.5
RCG----	Redford and Corazones soils, 30 to 70 percent slopes----------	23,307	0.9
RED----	Redlight and Terlingua soils and Rock outcrop, 5 to 35 percent slopes----	1,511	*
REE----	Reduff, Scotal, and Holguin soils, 1 to 30 percent slopes----------	9,614	0.4
RIA----	Riverwash and Pantera soils, 0 to 2 percent slopes, frequently flooded---	57,086	2.3
RMB----	Rockhouse, flooded-Medley complex, 0 to 5 percent slopes----------	11,691	0.5
SCB----	Sanmoss-Medley complex, 1 to 5 percent slopes----------	12,844	0.5
SDC----	Sauceda and Boludo soils, 1 to 8 percent slopes----------	23,556	1.0
SEE----	Sauceda-Decoty complex, 1 to 20 percent slopes----------	13,066	0.5
SHC----	Scotal and Holguin soils, 1 to 8 percent slopes----------	4,338	0.2
SHE----	Scotal-Rock outcrop complex, 5 to 30 percent slopes----------	3,313	0.1
SIG----	Scotal-Ohtwo-Rock outcrop complex, 20 to 70 percent slopes----------	60,608	2.5
SRA----	Straddlebug silty clay loam, 0 to 3 percent slopes----------	8,059	0.3
STE----	Strawhouse-Stillwell complex, 1 to 30 percent slopes----------	1,795	*
SUD----	Studybutte very gravelly sandy clay loam, 5 to 30 percent slopes---------	54,825	2.2
SUE----	Studybutte-Rock outcrop complex, 10 to 30 percent slopes----------	19,007	0.8
SUG----	Studybutte-Rock outcrop complex, 20 to 60 percent slopes----------	18,608	0.8

Table 10.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
TEA----	Tenneco-Bodecker complex, 0 to 3 percent slopes, flooded	8,226	0.3
TRE----	Terlingua-Rock outcrop complex, 3 to 30 percent slopes	8,847	0.4
TRG----	Terlingua-Rock outcrop complex, 20 to 70 percent slopes	44,813	1.8
VAA----	Verhalen silty clay, 0 to 2 percent slopes, rarely flooded	2,351	*
VCA----	Vicente, Lomapelona, and Castolon soils, 0 to 1 percent slopes, occasionally flooded	17,386	0.7
VOC----	Volco and Pardo soils, 1 to 8 percent slopes	23,149	0.9
W ----	Water	238	*
	Total	2,469,273	100.0

* Less than 0.1 percent.

Table 11.--Irrigated and Nonirrigated Yields by Map Unit

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability		Alfalfa hay		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Bu	Bu
ALB:			---	---	---	---	---	---
Altar	6c	---						
Bodecker	6c	---						
Riverwash	8w	---						
ANS:			---	---	---	---	---	---
Area not surveyed	---	---						
BAC:			---	---	---	---	---	---
Baviza	7s	---						
Pantera	7w	---						
BEB:			---	---	---	---	---	---
Berrend	3c	---						
Espy	6s	---						
BIC:			---	---	---	---	---	---
Bissett	7s	---						
Rock outcrop	8s	---						
BIE:			---	---	---	---	---	---
Bissett	7s	---						
Rock outcrop	8s	---						
BIG:			---	---	---	---	---	---
Bissett	7s	---						
Rock outcrop	8s	---						
BLE:			---	---	---	---	---	---
Blackgap	7s	---						
Rock outcrop	8s	---						
BLG:			---	---	---	---	---	---
Blackgap	7s	---						
Rock outcrop	8s	---						
BNE:			---	---	---	---	---	---
Bofecillos	7s	---						
Horsetrap	7s	---						
Rock outcrop	8s	---						
BNG:			---	---	---	---	---	---
Bofecillos	7s	---						
Rock outcrop	8s	---						
BOB:			---	---	---	---	---	---
Boracho	6s	---						
Espy	6s	---						
BOC:			---	---	---	---	---	---
Borunda	7s	---						
Borunda, gravelly	7s	---						

Table 11.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Bu	Bu
BRD:			---	---	---	---	---	---
Brewster	7s	---						
BRF:			---	---	---	---	---	---
Brewster	7s	---						
Rock outcrop	8s	---						
BRG:			---	---	---	---	---	---
Brewster	7s	---						
Rock outcrop	8s	---						
BUD:			---	---	---	---	---	---
Buckear	7s	---						
Coyanosa	7s	---						
CAA:			---	9.00	---	115.00	---	80.00
Castolon	7w	2w						
Lomapelona	---	---						
Galindo	---	---						
CAG:			---	---	---	---	---	---
Catto	7s	---						
Buckear	7s	---						
Rock outcrop	8s	---						
CIC:			---	---	---	---	---	---
Chilicotal	7s	---						
CID:			---	---	---	---	---	---
Chilicotal	7s	---						
CLC:			---	---	---	---	---	---
Chilicotal	7s	---						
Paisano	7s	---						
CMC:			---	---	---	---	---	---
Chilimol	3e	---						
Boracho	6s	---						
Berrend	3e	---						
CND:			---	---	---	---	---	---
Chinati	7s	---						
Boracho	6s	---						
Berrend	3e	---						
CNE:			---	---	---	---	---	---
Chinati	7s	---						
Boracho	6s	---						
COC:			---	---	---	---	---	---
Corazones	6c	---						
Ojinaga	7s	---						
COE:			---	---	---	---	---	---
Corazones	7e	---						
Ojinaga	7s	---						

Table 11.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Bu	Bu
CVC:			---	---	---	---	---	---
Costavar	6s	---						
Volco	7s	---						
EEB:			---	---	---	---	---	---
Espy	6s	---						
Eppenauer	3e	---						
GAA:			---	6.00	---	75.00	---	---
Galindo	7w	2w						
GEF:			---	---	---	---	---	---
Geefour	7s	---						
Geefour, eroded	7s	---						
GFF:			---	---	---	---	---	---
Geefour	7s	---						
Corazones	7e	---						
Ojinaga	7s	---						
GMF:			---	---	---	---	---	---
Geefour	7s	---						
Melado	6s	---						
GSA:			---	8.00	---	120.00	---	---
Gemelo	6c	---						
Straddlebug	6s	---						
HOB:			---	---	---	---	---	---
Holguin	7s	---						
HOD:			---	---	---	---	---	---
Horsetrap	7s	---						
Bofecillos	7s	---						
Rock outcrop	8s	---						
KIB:			---	---	---	---	---	---
Kinco	6c	---						
LGC:			---	---	---	---	---	---
Lingua	7s	---						
LIF:			---	---	---	---	---	---
Lingua	7s	---						
Ohtwo	7e	---						
MAE:			---	---	---	---	---	---
Manzanillo	7s	---						
Paisano	7s	---						
MBE:			---	---	---	---	---	---
Manzanillo	7s	---						
Chilicotal	7s	---						
Holguin	7s	---						
MCA:			---	---	---	---	---	---
Marfa	2w	---						

Table 11.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Bu	Bu
MDE:			---	---	---	---	---	---
Mariscal	7s	---						
Rock outcrop	8s	---						
MOA:			---	---	---	---	---	---
Martillo	6s	---						
Butcherknife	6s	---						
MPB:			---	---	---	---	---	---
Melado	6s	---						
Pantera	7w	---						
MUB:			---	---	---	---	---	---
Murray	3e	---						
Marfa	2c	---						
Boracho	6s	---						
MZA:			---	---	---	---	---	---
Musquiz	3c	---						
NLA:			---	6.00	---	75.00	---	35.00
Nillo	6c	---						
NPB:			---	---	---	---	---	---
Nolam	6c	---						
Paisano	7s	---						
PAC:			---	---	---	---	---	---
Paisano	7s	---						
PAD:			---	---	---	---	---	---
Paisano	7s	---						
PIB:			---	---	---	---	---	---
Paisano	7s	---						
Musgrave	7s	---						
PKD:			---	---	---	---	---	---
Pantak	7s	---						
Lingua	7s	---						
Rock outcrop	8s	---						
PKE:			---	---	---	---	---	---
Pantak	7s	---						
Lingua	7s	---						
Rock outcrop	8s	---						
PTA:			---	8.00	---	95.00	---	---
Phantom	3w	---						
PZB:			---	---	---	---	---	---
Phantom	3s	---						
Musquiz	3e	---						
QBE:			---	---	---	---	---	---
Quadria	6s	---						
Nolam	6c	---						
Musgrave	7s	---						

Table 11.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Bu	Bu
RCE:			---	---	---	---	---	---
Redford	7s	---						
Corazones	7e	---						
RCG:			---	---	---	---	---	---
Redford	7e	---						
Corazones	7e	---						
RED:			---	---	---	---	---	---
Redlight	7s	---						
Terlingua	7s	---						
Rock outcrop	8s	---						
REE:			---	---	---	---	---	---
Reduff	7s	---						
Scotal	7s	---						
Holguin	7s	---						
RIA:			---	---	---	---	---	---
Riverwash	8w	---						
Pantera	7w	---						
RMB:			---	---	---	---	---	---
Rockhouse	6s	---						
Medley	6s	---						
SCB:			---	---	---	---	---	---
Sanmoss	6s	---						
Medley	6s	---						
SDC:			---	---	---	---	---	---
Sauceda	7s	---						
Boludo	7s	---						
SEE:			---	---	---	---	---	---
Sauceda	7s	---						
Decoty	7s	---						
SHC:			---	---	---	---	---	---
Scotal	7s	---						
Holguin	7s	---						
SHE:			---	---	---	---	---	---
Scotal	7s	---						
Rock outcrop	8s	---						
SIG:			---	---	---	---	---	---
Scotal	7s	---						
Ohtwo	7e	---						
Rock outcrop	8s	---						
SRA:			---	---	---	---	---	---
Straddlebug	6s	---						
STE:			---	---	---	---	---	---
Strawhouse	7s	---						
Stillwell	6e	---						

Table 11.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Bu	Bu
SUD:			---	---	---	---	---	---
Studybutte	7s	---						
Rock outcrop	8s	---						
SUE:			---	---	---	---	---	---
Studybutte	7s	---						
Rock outcrop	8s	---						
SUG:			---	---	---	---	---	---
Studybutte	7s	---						
Rock outcrop	8s	---						
TEA:			---	---	---	---	---	---
Tenneco	6c	---						
Bodecker	6c	---						
TRE:			---	---	---	---	---	---
Terlingua	7s	---						
Rock outcrop	8s	---						
TRG:			---	---	---	---	---	---
Terlingua	7s	---						
Rock outcrop	8s	---						
VAA:			---	8.00	---	95.00	---	---
Verhalen	6c	---						
VCA:			---	8.00	---	90.00	---	65.00
Vicente	7w	2w						
Lomapelona	7w	2w						
Castolon	7w	2w						
VOC:			---	---	---	---	---	---
Volco	7s	---						
Pardo	7s	---						
W:			---	---	---	---	---	---
Water	---	---						

Table 12.--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
ALB:				
Altar	Gravelly, Desert Grassland	800	600	400
Bodecker	Arroyo, Desert Grassland	1,600	1,300	1,000
BAC:				
Baviza	Loamy Sand, Hot Desert Shrub	600	450	300
Pantera	Arroyo, Hot Desert Shrub	1,200	900	600
BEB:				
Berrend	Loamy Slope, Mixed Prairie	2,000	1,500	1,000
Espy	Shallow, Mixed Prairie	1,200	900	600
BIC:				
Bissett	Limestone Hill and Mountain, Desert Grassland	750	650	550
BIE:				
Bissett	Limestone Hill and Mountain, Desert Grassland	750	650	550
BIG:				
Bissett	Limestone Hill and Mountain, Desert Grassland	750	650	550
BLE:				
Blackgap	Limestone Hill and Mountain 8-14" PZ	550	450	350
BLG:				
Blackgap	Limestone Hill and Mountain 8-14" PZ	550	450	350
BNE:				
Bofecillos	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
Horsetrap	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
BNG:				
Bofecillos	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
BOB:				
Boracho	Shallow, Mixed Prairie	1,200	900	600
Espy	Shallow, Mixed Prairie	1,200	900	600
BOC:				
Borunda	Loamy, Desert Grassland	1,000	800	600
Borunda, gravelly	Gravelly, Desert Grassland	800	600	400
BRD:				
Brewster	Igneous Hill and Mountain, Mixed Prairie	1,500	1,200	900
BRF:				
Brewster	Igneous Hill and Mountain, Mixed Prairie	1,500	1,200	900

Table 12.--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
BRG:				
Brewster	Igneous Hill and Mountain, Mixed Prairie	1,500	1,200	900
BUD:				
Buckear	Sandstone Hill and Mountain, Desert Grassland	1,000	750	500
Coyanosa	Sandstone Hill and Mountain, Desert Grassland	1,000	750	500
CAA:				
Castolon	Loamy Bottomland, Hot Desert Shrub	2,500	2,000	1,500
CAG:				
Catto	Chert Hill, Desert Grassland	800	700	600
Buckear	Sandstone Hill and Mountain, Desert Grassland	1,000	750	500
CIC:				
Chilicotal	Gravelly, Desert Grassland	800	600	400
CID:				
Chilicotal	Gravelly, Desert Grassland	800	600	400
CLC:				
Chilicotal	Gravelly, Desert Grassland	800	600	400
Paisano	Gravelly, Desert Grassland	700	500	300
CMC:				
Chilimol	Gravelly, Mixed Prairie	1,300	1,100	900
Boracho	Shallow, Mixed Prairie	1,200	900	600
Berrend	Loamy Slope, Mixed Prairie	2,000	1,500	1,000
CND:				
Chinati	Shallow, Mixed Prairie	1,200	900	600
Boracho	Shallow, Mixed Prairie	1,200	900	600
Berrend	Loamy Slope, Mixed Prairie	2,000	1,500	1,000
CNE:				
Chinati	Shallow, Mixed Prairie	1,200	900	600
Boracho	Shallow, Mixed Prairie	1,200	900	600
COC:				
Corazones	Gravelly, Hot Desert Shrub	500	350	200
Ojinaga	Gravelly, Hot Desert Shrub	400	250	100
COE:				
Corazones	Gravelly, Hot Desert Shrub	500	350	200
Ojinaga	Gravelly, Hot Desert Shrub	400	250	100
CVC:				
Costavar	Basalt Hill, Mixed Prairie	1,300	1,000	700
Volco	Basalt Hill, Mixed Prairie	1,300	1,000	700
EEB:				
Espy	Shallow, Mixed Prairie	1,200	900	600
Eppenauer	Loamy Slope, Mixed Prairie	2,000	1,500	1,000

Table 12.--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
GAA:				
Galindo	Loamy Bottomland, Hot Desert Shrub	2,500	2,000	1,500
GEF:				
Geefour	Salty Clay Hill, Hot Desert Shrub	350	250	150
GFF:				
Geefour	Salty Clay Hill, Hot Desert Shrub	350	250	150
Corazones	Gravelly, Hot Desert Shrub	500	350	200
Ojinaga	Gravelly, Hot Desert Shrub	400	250	100
GMF:				
Geefour	Salty Clay Hill, Hot Desert Shrub	350	250	150
Melado	Salty Clay Fan, Hot Desert Shrub	300	200	100
GSA:				
Gemelo	Gravelly, Desert Grassland	800	600	400
Straddlebug	Loamy, Desert Grassland	1,000	800	600
HOB:				
Holguin	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
HOD:				
Horsetrap	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
Bofecillos	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
KIB:				
Kinco	Sandy Loam, Desert Grassland	900	800	700
LGC:				
Lingua	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
LIF:				
Lingua	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
Ohtwo	Igneous Hill and Mountain, Desert Grassland	1,200	1,000	750
MAE:				
Manzanillo	Gravelly, Desert Grassland	700	500	300
Paisano	Gravelly, Desert Grassland	700	500	300
MBE:				
Manzanillo	Gravelly, Desert Grassland	700	500	300
Chilicotal	Gravelly, Desert Grassland	800	600	400
Holguin	Igneous Hill and Mountain, Desert Grassland	1,000	800	600

Table 12.--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
MCA:				
Marfa	Loamy Swale, Mixed Prairie	2,500	2,000	1,500
MDE:				
Mariscal	Flagstone Hill 8-14" PZ	500	350	200
MOA:				
Martillo	Clay Flat, Desert Grassland	2,000	1,600	800
Butcherknife	Clay Flat, Desert Grassland	2,000	1,600	800
MPB:				
Melado	Salty Clay Fan, Hot Desert Shrub	300	200	100
Pantera	Arroyo, Hot Desert Shrub	1,200	900	600
MUB:				
Murray	Loamy Slope, Mixed Prairie	2,000	1,500	1,000
Marfa	Loamy Swale, Mixed Prairie	2,500	2,000	1,500
Boracho	Shallow, Mixed Prairie	1,200	900	600
MZA:				
Musquiz	Loamy Swale, Mixed Prairie	2,200	2,000	1,500
NLA:				
Nillo	Draw, Desert Grassland	2,000	1,600	1,200
NPB:				
Nolam	Gravelly, Desert Grassland	800	600	400
Paisano	Gravelly, Desert Grassland	700	500	300
PAC:				
Paisano	Gravelly, Desert Grassland	700	500	300
PAD:				
Paisano	Gravelly, Desert Grassland	700	500	300
PIB:				
Paisano	Gravelly, Desert Grassland	700	500	300
Musgrave	Clay Hill, Hot Desert Shrub	500	350	200
PKD:				
Pantak	Igneous Hill and Mountain, Desert Grassland	1,200	1,000	750
Lingua	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
PKE:				
Pantak	Igneous Hill and Mountain, Desert Grassland	1,200	1,000	750
Lingua	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
PTA:				
Phantom	Clay Flat, Mixed Prairie	2,500	1,800	1,000
PZB:				
Phantom	Clay Flat, Mixed Prairie	2,500	1,800	1,000
Musquiz	Loamy Swale, Mixed Prairie	2,500	2,000	1,500

Table 12.--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
QBE:				
Quadria	Loamy, Desert Grassland	1,000	800	600
Nolam	Gravelly, Desert Grassland	800	600	400
Musgrave	Clay Hill, Hot Desert Shrub	500	350	200
RCE:				
Redford	Gravelly, Hot Desert Shrub	400	250	100
Corazones	Gravelly, Hot Desert Shrub	500	350	200
RCG:				
Redford	Gravelly, Hot Desert Shrub	400	250	100
Corazones	Gravelly, Hot Desert Shrub	500	350	200
RED:				
Redlight	Limestone Hill and Mountain, Hot Desert Shrub	550	450	350
Terlingua	Igneous Hill and Mountain, Hot Desert Shrub	550	450	350
REE:				
Reduff	Igneous Hill and Mountain, Desert Grassland	1,100	900	700
Scotal	Igneous Hill and Mountain, Desert Grassland	1,100	900	700
Holguin	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
RIA:				
Pantera	Arroyo, Hot Desert Shrub	1,200	900	600
RMB:				
Rockhouse	Draw, Mixed Prairie	2,300	1,900	1,500
Medley	Gravelly, Mixed Prairie	1,300	1,100	900
SCB:				
Sanmoss	Gravelly, Mixed Prairie	1,300	1,100	900
Medley	Gravelly, Mixed Prairie	1,300	1,100	900
SDC:				
Sauceda	Igneous Hill and Mountain, Desert Grassland	1,100	900	700
Boludo	Gravelly, Desert Grassland	800	600	400
SEE:				
Sauceda	Igneous Hill and Mountain, Desert Grassland	1,100	900	700
Decoty	Igneous Hill and Mountain, Desert Grassland	1,100	900	700
SHC:				
Scotal	Igneous Hill and Mountain, Desert Grassland	1,100	900	700
Holguin	Igneous Hill and Mountain, Desert Grassland	1,000	800	600

Table 12.--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
SHE:				
Scotal	Igneous Hill and Mountain, Desert Grassland	1,100	900	700
SIG:				
Scotal	Igneous Hill and Mountain, Desert Grassland	1,100	900	700
Ohtwo	Igneous Hill and Mountain, Desert Grassland	1,200	1,000	750
SRA:				
Straddlebug	Loamy, Desert Grassland	1,000	800	600
STE:				
Strawhouse	Gravelly, Hot Desert Shrub	400	250	150
Stillwell	Gravelly, Hot Desert Shrub	500	350	200
SUD:				
Studybutte	Igneous Hill and Mountain, Hot Desert Shrub	550	450	350
SUE:				
Studybutte	Igneous Hill and Mountain, Hot Desert Shrub	550	450	350
SUG:				
Studybutte	Igneous Hill and Mountain, Hot Desert Shrub	550	450	350
TEA:				
Tenneco	Loamy, Desert Grassland	1,000	800	600
Bodecker	Arroyo, Desert Grassland	2,200	1,300	1,000
TRE:				
Terlingua	Basalt Hill, Hot Desert Shrub	350	250	150
TRG:				
Terlingua	Igneous Hill and Mountain, Hot Desert Shrub	550	450	350
VAA:				
Verhalen	Clay Flat, Desert Grassland	2,000	1,600	800
VCA:				
Vicente	Loamy Bottomland, Hot Desert Shrub	2,500	2,000	1,500
Lomapelona	Loamy Bottomland, Hot Desert Shrub	2,500	2,000	1,500
Castolon	Loamy Bottomland, Hot Desert Shrub	2,500	2,000	1,500
VOC:				
Volco	Basalt Hill, Mixed Prairie	1,300	1,000	700
Pardo	Shallow, Mixed Prairie	1,200	900	600

Table 13.--Rangeland Prescribed Burning

(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	Rangeland Prescribed Burning	
		Rating class and limiting features	Value
ALB:			
Altar	45	Very limited	
		Droughty	0.99
Bodecker	30	Very limited	
		Droughty	1.00
Riverwash	15	Not Rated	
ANS:			
Area not surveyed	100	Not Rated	
BAC:			
Baviza	75	Very limited	
		Wind erosion	1.00
		Droughty	1.00
		Low precipitation	0.52
		K factor	0.20
Pantera	21	Very limited	
		Wind erosion	1.00
		Droughty	1.00
		Low precipitation	0.52
BEB:			
Berrend	72	Somewhat limited	
		K factor	0.04
Espy	17	Somewhat limited	
		Droughty	0.50
		K factor	0.20
		Large stones	0.19
BIC:			
Bissett	65	Somewhat limited	
		Droughty	0.92
Rock outcrop	20	Not Rated	
BIE:			
Bissett	60	Very limited	
		Slope	1.00
		Droughty	0.92
Rock outcrop	25	Not Rated	
BIG:			
Bissett	70	Very limited	
		Slope	1.00
		Droughty	0.92
Rock outcrop	25	Not Rated	

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning: Rating class and limiting features	Value
BLE:			
Blackgap	52	Somewhat limited	
		Slope	0.94
		Droughty	0.92
		Low precipitation	0.52
Rock outcrop	45	Not Rated	
BLG:			
Blackgap	75	Very limited	
		Slope	1.00
		Droughty	0.92
		Low precipitation	0.52
Rock outcrop	20	Not Rated	
BNE:			
Bofecillos	47	Very limited	
		Droughty	1.00
		Slope	0.65
Horsetrap	21	Very limited	
		Droughty	1.00
		Large stones	1.00
		Slope	0.65
Rock outcrop	17	Not Rated	
BNG:			
Bofecillos	45	Very limited	
		Slope	1.00
		Droughty	0.76
Rock outcrop	40	Not Rated	
BOB:			
Boracho	60	Very limited	
		Droughty	1.00
Espy	20	Somewhat limited	
		Droughty	0.25
		K factor	0.01
BOC:			
Borunda	60	Somewhat limited	
		K factor	0.36
		Droughty	0.21
Borunda, gravelly	20	Not limited	
BRD:			
Brewster	75	Very limited	
		Droughty	1.00
		Large stones	0.19

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning: Rating class and limiting features	Value
BRF:			
Brewster	65	Very limited	
		Droughty	1.00
		Slope	1.00
		Large stones	0.19
Rock outcrop	15	Not Rated	
BRG:			
Brewster	60	Very limited	
		Slope	1.00
		Large stones	1.00
		Droughty	0.92
Rock outcrop	25	Not Rated	
BUD:			
Buckear	55	Very limited	
		Droughty	1.00
Coyanosa	35	Very limited	
		Droughty	1.00
		Slope	0.13
CAA:			
Castolon	79	Somewhat limited	
		factor	0.60
		Low precipitation	0.52
CAG:			
Catto	50	Very limited	
		Slope	1.00
		Droughty	0.92
Buckear	35	Very limited	
		Droughty	1.00
		Slope	1.00
Rock outcrop	10	Not Rated	
CIC:			
Chilicotal	80	Somewhat limited	
		Droughty	0.98
CID:			
Chilicotal	80	Somewhat limited	
		Droughty	0.98
		Slope	0.13
CLC:			
Chilicotal	61	Somewhat limited	
		Droughty	0.92
Paisano	32	Very limited	
		Droughty	1.00
CMC:			
Chilimol	45	Somewhat limited	
		Droughty	0.76

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning: Rating class and limiting features	Value
Boracho	32	Somewhat limited	
		Droughty	0.92
Berrend	13	Somewhat limited	
		K factor	0.20
CND:			
Chinati	54	Very limited	
		Droughty	1.00
Boracho	19	Somewhat limited	
		Droughty	0.99
Berrend	12	Somewhat limited	
		Droughty	0.41
		K factor	0.11
CNE:			
Chinati	50	Very limited	
		Droughty	1.00
		Slope	0.06
Boracho	30	Somewhat limited	
		Droughty	0.92
		Slope	0.22
COC:			
Corazones	50	Very limited	
		Droughty	1.00
		Low precipitation	0.52
Ojinaga	40	Very limited	
		Droughty	1.00
		Large stones	0.76
		Low precipitation	0.52
COE:			
Corazones	61	Very limited	
		Droughty	1.00
		Slope	1.00
		Low precipitation	0.52
Ojinaga	26	Very limited	
		Slope	1.00
		Large stones	1.00
		Droughty	0.76
		Low precipitation	0.52
CVC:			
Costavar	53	Somewhat limited	
		Droughty	0.92
		Large stones	0.19
Volco	19	Very limited	
		Droughty	1.00

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning: Rating class and limiting features	Value
EEB:			
Espy	56	Somewhat limited	
		Droughty	0.50
		K factor	0.20
Eppenauer	39	Somewhat limited	
		Droughty	0.17
		K factor	0.04
GAA:			
Galindo	76	Somewhat limited	
		Low precipitation	0.52
		Droughty	0.08
		K factor	0.01
GEF:			
Geefour	45	Somewhat limited	
		Slope	0.94
		Droughty	0.92
		Low precipitation	0.52
		K factor	0.04
Geefour, eroded	35	Very limited	
		Slope	1.00
		Droughty	0.76
		Low precipitation	0.52
		K factor	0.20
GFF:			
Geefour	53	Very limited	
		Slope	1.00
		Droughty	0.76
		Low precipitation	0.52
		K factor	0.04
Corazones	21	Very limited	
		Slope	1.00
		Droughty	0.99
		Low precipitation	0.52
Ojinaga	13	Very limited	
		Droughty	1.00
		Large stones	0.76
		Low precipitation	0.52
		Slope	0.06
GMF:			
Geefour	49	Somewhat limited	
		Slope	0.94
		Droughty	0.92
		Low precipitation	0.52
		K factor	0.04
Melado	31	Very limited	
		Droughty	0.99
		Low precipitation	0.52
		K factor	0.20

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning: Rating class and limiting features	Value
GSA:			
Gemelo	60	Somewhat limited	
		Droughty	0.92
		K factor	0.20
Straddlebug	25	Somewhat limited	
		K factor	0.20
HOB:			
Holguin	85	Very limited	
		Droughty	1.00
		Large stones	1.00
HOD:			
Horsetrap	57	Somewhat limited	
		Droughty	0.92
Bofecillos	28	Very limited	
		Droughty	1.00
Rock outcrop	10	Not Rated	
KIB:			
Kinco	80	Somewhat limited	
		Droughty	0.89
LGC:			
Lingua	70	Very limited	
		Droughty	0.99
LIF:			
Lingua	55	Very limited	
		Slope	1.00
		Droughty	1.00
Ohtwo	30	Very limited	
		Slope	1.00
		Droughty	0.92
MAE:			
Manzanillo	65	Very limited	
		Droughty	1.00
		Slope	0.65
Paisano	30	Somewhat limited	
		Slope	0.65
		Droughty	0.50
MBE:			
Manzanillo	40	Very limited	
		Droughty	1.00
		Slope	0.78
Chilicotal	25	Very limited	
		Droughty	1.00
		Slope	0.78

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning: Rating class and limiting features	Value
Holguin	20	Very limited	
		Droughty	1.00
		Slope	0.78
MCA:			
Marfa	92	Somewhat limited	
		K factor	0.11
MDE:			
Mariscal	80	Very limited	
		Droughty	1.00
		Slope	1.00
		Large stones	1.00
		Low precipitation	0.52
Rock outcrop	15	Not Rated	
MOA:			
Martillo	60	Somewhat limited	
		K factor	0.20
Butcherknife	25	Somewhat limited	
		K factor	0.60
MPB:			
Melado	54	Very limited	
		Droughty	1.00
		Low precipitation	0.52
		K factor	0.20
Pantera	38	Somewhat limited	
		Droughty	0.56
		Low precipitation	0.52
		K factor	0.20
MUB:			
Murray	58	Somewhat limited	
		Droughty	0.08
		K factor	0.04
Marfa	21	Somewhat limited	
		K factor	0.11
Boracho	15	Somewhat limited	
		Droughty	0.96
MZA:			
Musquiz	80	Somewhat limited	
		K factor	0.20
NLA:			
Nillo	90	Somewhat limited	
		K factor	0.80
NPB:			
Nolam	55	Very limited	
		Droughty	1.00

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning: Rating class and limiting features	Value
Paisano	25	Very limited	
		Droughty	1.00
PAC:			
Paisano	80	Very limited	
		Droughty	1.00
PAD:			
Paisano	80	Very limited	
		Droughty	1.00
PIB:			
Paisano	55	Very limited	
		Droughty	1.00
Musgrave	35	Somewhat limited	
		K factor	0.11
PKD:			
Pantak	46	Very limited	
		Droughty	1.00
Lingua	35	Very limited	
		Droughty	1.00
PKE:			
Pantak	36	Very limited	
		Droughty	1.00
		Slope	0.94
Lingua	24	Very limited	
		Droughty	1.00
		Large stones	1.00
		Slope	0.94
Rock outcrop	19	Not Rated	
PTA:			
Phantom	86	Somewhat limited	
		K factor	0.11
PZB:			
Phantom	45	Somewhat limited	
		K factor	0.01
Musquiz	39	Somewhat limited	
		K factor	0.20
QBE:			
Quadria	40	Somewhat limited	
		K factor	0.20
Nolam	30	Somewhat limited	
		Droughty	0.71
		K factor	0.01
Musgrave	25	Somewhat limited	
		Slope	0.94
		K factor	0.11

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning: Rating class and limiting features	Value
RCE:			
Redford	52	Very limited	
		Droughty	1.00
		Slope	1.00
		Large stones	0.76
		Low precipitation	0.52
Corazones	32	Very limited	
		Droughty	1.00
		Slope	1.00
		Low precipitation	0.52
RCG:			
Redford	54	Very limited	
		Droughty	1.00
		Slope	1.00
		Large stones	0.76
		Low precipitation	0.52
Corazones	36	Very limited	
		Slope	1.00
		Droughty	1.00
		Low precipitation	0.52
RED:			
Redlight	45	Very limited	
		Droughty	1.00
		Slope	1.00
		Low precipitation	0.52
Terlingua	15	Very limited	
		Droughty	1.00
		Slope	0.65
		Low precipitation	0.52
Rock outcrop	24	Not Rated	
REE:			
Reduff	30	Very limited	
		Droughty	1.00
		Slope	0.94
Scotal	30	Very limited	
		Large stones	1.00
		Droughty	0.99
		Slope	0.94
Holguin	25	Very limited	
		Droughty	1.00
RIA:			
Riverwash	50	Not Rated	
Pantera	36	Very limited	
		Droughty	1.00
		Low precipitation	0.52

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning: Rating class and limiting features	Value
RMB:			
Rockhouse	60	Somewhat limited	
		Large stones	0.19
		K factor	0.04
		Droughty	0.01
Medley	27	Somewhat limited	
		Droughty	0.73
		K factor	0.01
SCB:			
Sanmoss	65	Somewhat limited	
		Droughty	0.76
Medley	25	Somewhat limited	
		Droughty	0.08
		K factor	0.01
SDC:			
Sauceda	60	Very limited	
		Droughty	0.99
Boludo	20	Somewhat limited	
		Droughty	0.92
SEE:			
Sauceda	55	Very limited	
		Droughty	0.99
		Slope	0.06
Decoty	40	Very limited	
		Droughty	1.00
		Slope	0.06
SHC:			
Scotal	50	Very limited	
		Droughty	1.00
		Large stones	1.00
Holguin	35	Very limited	
		Droughty	1.00
SHE:			
Scotal	65	Very limited	
		Droughty	1.00
		Slope	0.13
Rock outcrop	15	Not Rated	
SIG:			
Scotal	40	Very limited	
		Slope	1.00
		Large stones	1.00
		Droughty	0.99
Ohtwo	30	Very limited	
		Slope	1.00
		Droughty	0.76

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning: Rating class and limiting features	Value
Rock outcrop--------	20	Not Rated	
SRA:			
Straddlebug---------	80	Somewhat limited	
		K factor	0.20
STE:			
Strawhouse----------	50	Somewhat limited	
		Droughty	0.98
		Low precipitation	0.52
		Large stones	0.19
Stillwell----------	35	Very limited	
		Droughty	1.00
		Low precipitation	0.52
		Slope	0.06
SUD:			
Studybutte----------	85	Very limited	
		Droughty	1.00
		Slope	0.94
		Low precipitation	0.52
SUE:			
Studybutte----------	60	Very limited	
		Droughty	1.00
		Slope	0.94
		Low precipitation	0.52
Rock outcrop--------	25	Not Rated	
SUG:			
Studybutte----------	60	Very limited	
		Slope	1.00
		Droughty	1.00
		Low precipitation	0.52
Rock outcrop--------	30	Not Rated	
TEA:			
Tenneco----------	70	Somewhat limited	
		K factor	0.60
Bodecker----------	15	Somewhat limited	
		K factor	0.36
TRE:			
Terlingua----------	70	Very limited	
		Droughty	1.00
		Slope	0.78
		Large stones	0.76
		Low precipitation	0.52
Rock outcrop--------	25	Not Rated	

Table 13.--Rangeland Prescribed Burning--Continued

Map symbol and soil name	Pct. of map unit	Rangeland Prescribed Burning	
		Rating class and limiting features	Value
TRG:			
Terlingua	65	Very limited	
		Droughty	1.00
		Slope	1.00
		Low precipitation	0.52
Rock outcrop	30	Not Rated	
VAA:			
Verhalen	80	Somewhat limited	
		K factor	0.11
		Droughty	0.01
VCA:			
Vicente	30	Somewhat limited	
		K factor	0.80
		Low precipitation	0.52
Lomapelona	29	Somewhat limited	
		Low precipitation	0.52
		factor	0.20
Castolon	25	Somewhat limited	
		factor	0.60
		Low precipitation	0.52
VOC:			
Volco	45	Very limited	
		Droughty	0.99
Pardo	45	Somewhat limited	
		Droughty	0.05
W:			
Water	100	Not Rated	

Table 14.--Ranch Access Roads

(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	Ranch Access Roads	
		Rating class and limiting features	Value
ALB:			
Altar	45	Not limited	
Bodecker	30	Somewhat limited	
		Sandy surface	0.50
		Dusty	0.50
Riverwash	15	Not rated	
ANS:			
Area not surveyed	100	Not rated	
BAC:			
Baviza	75	Somewhat limited	
		Sandy surface	0.50
		Dusty	0.50
Pantera	21	Very limited	
		Flooding	1.00
		Dusty	0.50
BEB:			
Berrend	72	Not limited	
Espy	17	Somewhat limited	
		Large stones	0.19
BIC:			
Bissett	65	Not limited	
Rock outcrop	20	Not rated	
BIE:			
Bissett	60	Very limited	
		Slope	1.00
Rock outcrop	25	Not rated	
BIG:			
Bissett	70	Very limited	
		Slope	1.00
Rock outcrop	25	Not rated	
BLE:			
Blackgap	52	Somewhat limited	
		Slope	0.94
Rock outcrop	45	Not rated	

Table 14.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
BLG:			
Blackgap	75	Very limited	
		Slope	1.00
Rock outcrop	20	Not rated	
BNE:			
Bofecillos	47	Somewhat limited	
		Too gravelly	0.86
		Slope	0.65
		Dusty	0.50
Horsetrap	21	Very limited	
		Large stones	1.00
		Slope	0.65
Rock outcrop	17	Not rated	
BNG:			
Bofecillos	45	Very limited	
		Slope	1.00
		Dusty	0.50
Rock outcrop	40	Not rated	
BOB:			
Boracho	60	Not limited	
Espy	20	Not limited	
BOC:			
Borunda	60	Not limited	
Borunda, gravelly	20	Not limited	
BRD:			
Brewster	75	Somewhat limited	
		Dusty	0.50
		Large stones	0.19
BRF:			
Brewster	65	Very limited	
		Slope	1.00
		Large stones	0.19
Rock outcrop	15	Not rated	
BRG:			
Brewster	60	Very limited	
		Slope	1.00
		Large stones	1.00
		Dusty	0.50
		Surface stones	0.10
Rock outcrop	25	Not rated	

Table 14.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
BUD:			
Buckear	55	Somewhat limited	
		Dusty	0.50
Coyanosa	35	Somewhat limited	
		Dusty	0.50
		Too gravelly	0.21
		Slope	0.13
CAA:			
Castolon	79	Somewhat limited	
		Dusty	0.50
CAG:			
Catto	50	Very limited	
		Slope	1.00
		Dusty	0.50
		Too gravelly	0.14
Buckear	35	Very limited	
		Slope	1.00
		Dusty	0.50
Rock outcrop	10	Not rated	
CIC:			
Chilicotal	80	Not limited	
CID:			
Chilicotal	80	Somewhat limited	
		Slope	0.13
CLC:			
Chilicotal	61	Not limited	
Paisano	32	Not limited	
CMC:			
Chilimol	45	Somewhat limited	
		Dusty	0.50
Boracho	32	Not limited	
Berrend	13	Not limited	
CND:			
Chinati	54	Not limited	
Boracho	19	Not limited	
Berrend	12	Not limited	
CNE:			
Chinati	50	Somewhat limited	
		Slope	0.06
Boracho	30	Somewhat limited	
		Slope	0.22

Table 14.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
COC:			
Corazones	50	Not limited	
Ojinaga	40	Somewhat limited	
		Large stones	0.76
COE:			
Corazones	61	Very limited	
		Slope	1.00
Ojinaga	26	Very limited	
		Slope	1.00
		Large stones	1.00
CVC:			
Costavar	53	Somewhat limited	
		Large stones	0.19
Volco	19	Not limited	
EEB:			
Espy	56	Not limited	
Eppenauer	39	Not limited	
GAA:			
Galindo	76	Somewhat limited	
		Dusty	0.50
		Too clayey	0.25
GEF:			
Geefour	45	Somewhat limited	
		Slope	0.94
		Dusty	0.50
		Too clayey	0.25
Geefour, eroded	35	Very limited	
		Slope	1.00
		Water erosion	0.61
		Dusty	0.50
		Too clayey	0.25
GFF:			
Geefour	53	Very limited	
		Slope	1.00
		Dusty	0.50
		Too clayey	0.25
		Water erosion	0.03
Corazones	21	Very limited	
		Slope	1.00
Ojinaga	13	Somewhat limited	
		Large stones	0.76
		Slope	0.06

Table 14.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
GMF:			
Geefour	49	Somewhat limited	
		Slope	0.94
		Too clayey	0.50
Melado	31	Somewhat limited	
		Too clayey	0.50
GSA:			
Gemelo	60	Not limited	
Straddlebug	25	Not limited	
HOB:			
Holguin	85	Very limited	
		Large stones	1.00
		Dusty	0.50
HOD:			
Horsetrap	57	Not limited	
Bofecillos	28	Somewhat limited	
		Dusty	0.50
		Too gravelly	0.32
Rock outcrop	10	Not rated	
KIB:			
Kinco	80	Not limited	
LGC:			
Lingua	70	Somewhat limited	
		Dusty	0.50
LIF:			
Lingua	55	Very limited	
		Slope	1.00
		Dusty	0.50
Ohtwo	30	Very limited	
		Slope	1.00
MAE:			
Manzanillo	65	Somewhat limited	
		Slope	0.65
Paisano	30	Somewhat limited	
		Slope	0.65
MBE:			
Manzanillo	40	Somewhat limited	
		Slope	0.78
Chilicotal	25	Somewhat limited	
		Slope	0.78
		Surface stones	0.01

Table 14.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
Holguin	20	Somewhat limited	
		Slope	0.78
		Dusty	0.50
MCA:			
Marfa	92	Not limited	
MDE:			
Mariscal	80	Very limited	
		Slope	1.00
		Large stones	1.00
		Dusty	0.50
		Surface stones	0.10
Rock outcrop	15	Not rated	
MOA:			
Martillo	60	Not limited	
Butcherknife	25	Not limited	
MPB:			
Melado	54	Somewhat limited	
		Too clayey	0.50
Pantera	38	Not limited	
MUB:			
Murray	58	Not limited	
Marfa	21	Not limited	
Boracho	15	Not limited	
MZA:			
Musquiz	80	Not limited	
NLA:			
Nillo	90	Somewhat limited	
		Dusty	0.50
		Too clayey	0.25
NPB:			
Nolam	55	Not limited	
Paisano	25	Somewhat limited	
		Too gravelly	0.15
PAC:			
Paisano	80	Not limited	
PAD:			
Paisano	80	Not limited	
PIB:			
Paisano	55	Not limited	
Musgrave	35	Somewhat limited	
		Dusty	0.50

Table 14.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
PKD:			
Pantak	46	Not limited	
Lingua	35	Somewhat limited	
		Dusty	0.50
		Too gravelly	0.08
PKE:			
Pantak	36	Somewhat limited	
		Slope	0.94
Lingua	24	Very limited	
		Large stones	1.00
		Slope	0.94
		Dusty	0.50
		Surface stones	0.02
Rock outcrop	19	Not rated	
PTA:			
Phantom	86	Not limited	
PZB:			
Phantom	45	Somewhat limited	
		Too clayey	0.25
Musquiz	39	Not limited	
QBE:			
Quadria	40	Not limited	
Nolam	30	Not limited	
Musgrave	25	Somewhat limited	
		Slope	0.94
		Dusty	0.50
		Water erosion	0.22
RCE:			
Redford	52	Very limited	
		Slope	1.00
		Large stones	0.76
		Too gravelly	0.07
Corazones	32	Very limited	
		Slope	1.00
RCG:			
Redford	54	Very limited	
		Slope	1.00
		Large stones	0.76
		Too gravelly	0.12
Corazones	36	Very limited	
		Slope	1.00
RED:			
Redlight	45	Very limited	
		Slope	1.00

Table 14.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
Terlingua	15	Somewhat limited	
		Slope	0.65
		Dusty	0.50
Rock outcrop	24	Not rated	
REE:			
Reduff	30	Somewhat limited	
		Slope	0.94
		Dusty	0.50
Scotal	30	Very limited	
		Large stones	1.00
		Slope	0.94
		Dusty	0.50
Holguin	25	Somewhat limited	
		Dusty	0.50
RIA:			
Riverwash	50	Not rated	
Pantera	36	Very limited	
		Flooding	1.00
		Dusty	0.50
RMB:			
Rockhouse	60	Somewhat limited	
		Large stones	0.19
Medley	27	Not limited	
SCB:			
Sanmoss	65	Not limited	
Medley	25	Not limited	
SDC:			
Sauceda	60	Somewhat limited	
		Dusty	0.50
Boludo	20	Somewhat limited	
		Surface stones	0.01
SEE:			
Sauceda	55	Somewhat limited	
		Dusty	0.50
		Slope	0.06
Decoty	40	Somewhat limited	
		Slope	0.06
SHC:			
Scotal	50	Very limited	
		Large stones	1.00
		Dusty	0.50
Holguin	35	Somewhat limited	
		Dusty	0.50

Table 14.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
SHE:			
Scotal	65	Somewhat limited	
		Dusty	0.50
		Surface stones	0.46
		Slope	0.13
Rock outcrop	15	Not rated	
SIG:			
Scotal	40	Very limited	
		Slope	1.00
		Large stones	1.00
		Dusty	0.50
Ohtwo	30	Very limited	
		Slope	1.00
Rock outcrop	20	Not rated	
SRA:			
Straddlebug	80	Not limited	
STE:			
Strawhouse	50	Somewhat limited	
		Large stones	0.19
Stillwell	35	Somewhat limited	
		Slope	0.06
SUD:			
Studybutte	85	Somewhat limited	
		Slope	0.94
		Dusty	0.50
SUE:			
Studybutte	60	Somewhat limited	
		Slope	0.94
		Dusty	0.50
Rock outcrop	25	Not rated	
SUG:			
Studybutte	60	Very limited	
		Slope	1.00
		Dusty	0.50
Rock outcrop	30	Not rated	
TEA:			
Tenneco	70	Not limited	
Bodecker	15	Somewhat limited	
		Dusty	0.50

Table 14.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
TRE:			
Terlingua	70	Somewhat limited	
		Slope	0.78
		Large stones	0.76
		Dusty	0.50
Rock outcrop	25	Not rated	
TRG:			
Terlingua	65	Very limited	
		Slope	1.00
		Dusty	0.50
Rock outcrop	30	Not rated	
VAA:			
Verhalen	80	Somewhat limited	
		Dusty	0.50
		Too clayey	0.25
VCA:			
Vicente	30	Somewhat limited	
		Dusty	0.50
Lomapelona	29	Somewhat limited	
		Dusty	0.50
Castolon	25	Somewhat limited	
		Dusty	0.50
VOC:			
Volco	45	Not limited	
Pardo	45	Not limited	
W:			
Water	100	Not rated	

Table 15.--Excavations for Plastic Pipelines and Fencing Depths

(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	Excavations to 24 inches for Plastic Pipelines		Fencing, Post Depth Less Than 24 inches		Fencing, Post Depth Less Than 36 inches	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ALB:							
Altar	45	Somewhat limited		Very limited		Very Limited	
		Rare flooding	0.50	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.40	Rare flooding	0.50	Rare flooding	0.50
		High shrink-swell	0.01	Too clayey	0.01	Too clayey	0.01
		Too clayey	0.01				
Bodecker	30	Somewhat limited		Somewhat limited		Very Limited	
		Occasional flooding	0.70	Occasional flooding	0.70	Too gravelly	0.99
		Large stones	0.61	Large stones	0.61	Occasional flooding	0.70
		Unstable excavation walls	0.40	Too gravelly	0.59	Large stones	0.61
Riverwash	15	Not rated		Not rated		Not rated	
ANS:							
Area not surveyed	100	Not rated		Not rated		Not rated	
BAC:							
Baviza	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.40	Too Sandy	0.50	Too Sandy	0.50
		High shrink-swell	0.01				
Pantera	21	Very limited		Very limited		Very Limited	
		Frequent flooding	1.00	Frequent flooding	1.00	Frequent flooding	1.00
		Unstable excavation walls	0.40	Too gravelly	0.99	Too gravelly	0.99
		High shrink-swell	0.01				
BEB:							
Berrend	72	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.16	Too clayey	0.16	Too clayey	0.16
		Unstable excavation walls	0.10	Very high shrink-swell	0.05	Very high shrink-swell	0.04
		High shrink-swell	0.07				
Espy	17	Somewhat limited		Not limited		Not limited	
		High shrink-swell	0.50				
		Unstable excavation walls	0.10				
BIC:							
Bissett	65	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	0.98	Too gravelly	0.98
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
BIE:							
Bissett----------	60	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Unstable excavation walls	0.10	Too gravelly	0.98	Too gravelly	0.98
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	70	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	0.98	Too gravelly	0.98
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BLE:							
Blackgap----------	52	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
		Slope	0.94	Slope	0.94	Slope	0.94
		Unstable excavation walls	0.10	Too gravelly	0.93	Too gravelly	0.93
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02
Rock outcrop--------	45	Not rated		Not rated		Not rated	
BLG:							
Blackgap----------	75	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
		Unstable excavation walls	0.10	Too gravelly	0.93	Too gravelly	0.93
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BNE:							
Bofecillos----------	47	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.65	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Slope	0.65	Slope	0.65
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
Horsetrap----------	21	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.65	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Large stones	0.68	Large stones	0.68
		Too clayey	0.02	Slope	0.65	Slope	0.65
				Too clayey	0.02	Too clayey	0.02
Rock outcrop--------	17	Not rated		Not rated		Not rated	
BNG:							
Bofecillos----------	45	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Unstable excavation walls	0.10	Too gravelly	0.46	Too gravelly	0.46
		Too clayey	0.04	Too clayey	0.04	Too clayey	0.04
Rock outcrop--------	40	Not rated		Not rated		Not rated	
BOB:							
Boracho----------	60	Somewhat limited		Very limited		Very Limited	
		High shrink-swell	0.50	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.40	Too clayey	0.06	Too clayey	0.06
		Too clayey	0.06				
Espy----------	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.50	Too gravelly	0.46	Too gravelly	0.46
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.03
BOC:							
Borunda----------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.90	Too clayey	0.90	Too clayey	0.90
		Unstable excavation walls	0.40	Excess salt	0.50	Excess salt	0.50
				Very high shrink-swell	0.03	Depth to paralithic bedrock	0.07
						Very high shrink-swell	0.01
Borunda, gravelly---	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.75	Too clayey	0.75	Too clayey	0.75
		Unstable excavation walls	0.40	Excess salt	0.50	Excess salt	0.50
				Very high shrink-swell	0.04	Depth to paralithic bedrock	0.04
						Very high shrink-swell	0.01
BRD:							
Brewster----------	75	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
BRF:							
Brewster----------	65	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.11	Too gravelly	0.99	Too gravelly	0.99
		Unstable excavation walls	0.10	Too clayey	0.11	Too clayey	0.11
Rock outcrop--------	15	Not rated		Not rated		Not rated	
BRG:							
Brewster----------	60	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.39	Large stones	0.82	Large stones	0.82
		Unstable excavation walls	0.10	Large stones	0.39	Large stones	0.39
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BUD:							
Buckear----------	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to paralithic bedrock	0.62	Depth to paralithic bedrock	0.62	Depth to paralithic bedrock	0.69
		Unstable excavation walls	0.10	Too gravelly	0.60	Too gravelly	0.60
Coyanosa----------	35	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.13	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Slope	0.13	Slope	0.13
CAA:							
Castolon----------	79	Somewhat limited		Somewhat limited		Somewhat limited	
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		High shrink-swell	0.39	Too clayey	0.26	Too clayey	0.26
		Too clayey	0.26	Very high shrink-swell	0.06	Very high shrink-swell	0.06
		Unstable excavation walls	0.10				
CAG:							
Catto----------	50	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too clayey	0.28	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Too clayey	0.28	Too clayey	0.28

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
Buckear	35	Very limited		Very limited		Very Limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to paralithic bedrock	0.33	Too gravelly	0.60	Too gravelly	0.60
		Unstable excavation walls	0.10	Depth to paralithic bedrock	0.33	Depth to paralithic bedrock	0.56
Rock outcrop	10	Not rated		Not rated		Not rated	
CIC:							
Chilicotal	80	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.40	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02
		High shrink-swell	0.01				
CID:							
Chilicotal	80	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.40	Too gravelly	1.00	Too gravelly	1.00
		Slope	0.13	Slope	0.13	Slope	0.13
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02
		High shrink-swell	0.01				
CLC:							
Chilicotal	61	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Too gravelly	0.88	Too gravelly	0.88
		Large stones	0.08	Large stones	0.08	Large stones	0.08
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02
		High shrink-swell	0.01				
Paisano	32	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.50	Too gravelly	1.00	Too gravelly	1.00
CMC:							
Chilimol	45	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.40	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
		High shrink-swell	0.01				
Boracho	32	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.50	Too gravelly	1.00	Too gravelly	1.00
Berrend	13	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.16	Too clayey	0.16	Too clayey	0.16
		High shrink-swell	0.12	Very high shrink-swell	0.05	Very high shrink-swell	0.05
		Unstable excavation walls	0.10				

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
CND:							
Chinati	54	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to hard bedrock	0.68	Depth to hard bedrock	0.68	Depth to hard bedrock	0.98
		Unstable excavation walls	0.10	Too gravelly	0.54	Too gravelly	0.54
		Too clayey	0.06	Too clayey	0.06	Too clayey	0.06
Boracho	19	Somewhat limited		Somewhat limited		Very Limited	
		Large stones	0.74	Large stones	0.74	Too gravelly	1.00
		Unstable excavation walls	0.50	Too gravelly	0.68	Large stones	0.74
		Too clayey	0.22	Too clayey	0.22	Too clayey	0.22
Berrend	12	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.10	Too clayey	0.10	Too clayey	0.10
		Unstable excavation walls	0.10	Very high shrink-swell	0.01	Very high shrink-swell	0.01
CNE:							
Chinati	50	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
		Slope	0.06	Slope	0.06	Depth to hard bedrock	0.32
		Too clayey	0.06	Too clayey	0.06	Slope	0.06
						Too clayey	0.06
Boracho	30	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.50	Too gravelly	1.00	Too gravelly	1.00
		Slope	0.22	Slope	0.22	Slope	0.22
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
COC:							
Corazones	50	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.40	Too gravelly	0.99	Too gravelly	1.00
		High shrink-swell	0.01				
Ojinaga	40	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.50	Too gravelly	1.00	Too gravelly	1.00
COE:							
Corazones	61	Very limited		Very limited		Very Limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Unstable excavation walls	0.40	Too gravelly	0.99	Too gravelly	0.99
		High shrink-swell	0.01				
Ojinaga	26	Very limited		Very limited		Very Limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Unstable excavation walls	0.50	Too gravelly	0.84	Too gravelly	1.00
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines		Fencing, Post Depth Less Than 24 inches		Fencing, Post Depth Less Than 36 inches	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CVC:							
Costavar	53	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too clayey	0.16	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Too clayey	0.16	Too clayey	0.16
Volco	19	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
		Unstable excavation walls	0.10	Too gravelly	0.58	Too gravelly	0.58
		Too clayey	0.06	Too clayey	0.06	Too clayey	0.06
EEB:							
Espy	56	Somewhat limited		Not limited		Not limited	
		Unstable excavation walls	0.50				
Eppenauer	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.40	Too clayey	0.01	Depth to paralithic bedrock	0.19
		Too clayey	0.01	Depth to paralithic bedrock	0.01	Too clayey	0.01
		Depth to paralithic bedrock	0.01				
GAA:							
Galindo	76	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.97	Too clayey	0.97	Too clayey	0.97
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		Unstable excavation walls	0.70	Very high shrink-swell	0.48	Very high shrink-swell	0.26
		High shrink-swell	0.18				
GEF:							
Geefour	45	Somewhat limited		Very limited		Very Limited	
		Slope	0.94	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.75	Slope	0.94	Slope	0.94
		Depth to paralithic bedrock	0.62	Too clayey	0.75	Too clayey	0.75
		High shrink-swell	0.50	Depth to paralithic bedrock	0.62	Depth to paralithic bedrock	0.69
		Unstable excavation walls	0.10	Excess salt	0.50	Excess salt	0.50

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines		Fencing, Post Depth Less Than 24 inches		Fencing, Post Depth Less Than 36 inches	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Geefour, eroded-----	35	Very limited		Very limited		Very Limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.75	Too clayey	0.75	Too clayey	0.75
		Depth to paralithic bedrock	0.62	Depth to paralithic bedrock	0.62	Depth to paralithic bedrock	0.69
		High shrink-swell	0.50	Excess salt	0.50	Excess salt	0.50
		Unstable excavation walls	0.10				
GFF:							
Geefour----------	53	Very limited		Very limited		Very Limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.75	Too clayey	0.75	Too clayey	0.75
		High shrink-swell	0.50	Excess salt	0.50	Depth to paralithic bedrock	0.59
		Depth to paralithic bedrock	0.40	Depth to paralithic bedrock	0.40	Excess salt	0.50
		Unstable excavation walls	0.10	Very high shrink-swell	0.01	Very high shrink-swell	0.01
Corazones----------	21	Very limited		Very limited		Very Limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.80	Large stones	0.80	Large stones	0.80
		Unstable excavation walls	0.40	Too gravelly	0.58	Too gravelly	0.58
		High shrink-swell	0.01				
Ojinaga----------	13	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.50	Too gravelly	1.00	Too gravelly	1.00
		Slope	0.06	Slope	0.06	Slope	0.06
GMF:							
Geefour----------	49	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.94	Slope	0.94	Slope	0.94
		Too clayey	0.89	Too clayey	0.89	Too clayey	0.89
		High shrink-swell	0.50	Excess salt	0.50	Excess salt	0.50
		Unstable excavation walls	0.10	Depth to paralithic bedrock	0.09	Depth to paralithic bedrock	0.38
		Depth to paralithic bedrock	0.09	Very high shrink-swell	0.04	Very high shrink-swell	0.01
Melado----------	31	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.84	Too clayey	0.84	Too clayey	0.84
		High shrink-swell	0.50	Excess salt	0.50	Excess salt	0.50
		Unstable excavation walls	0.10	Very high shrink-swell	0.22	Very high shrink-swell	0.21
GSA:							
Gemelo----------	60	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.40	Too gravelly	1.00	Too gravelly	1.00
		High shrink-swell	0.01				

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
Straddlebug---------	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.73	Too clayey	0.73	Too clayey	0.73
		High shrink-swell	0.13	Very high shrink-swell	0.10	Very high shrink-swell	0.05
		Unstable excavation walls	0.10				
HOB:							
Holguin----------	85	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
HOD:							
Horsetrap----------	57	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too clayey	0.11	Too gravelly	0.80	Too gravelly	0.80
		Unstable excavation walls	0.10	Too clayey	0.11	Too clayey	0.11
Bofecillos----------	28	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too clayey	0.11	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Too clayey	0.11	Too clayey	0.11
Rock outcrop--------	10	Not rated		Not rated		Not rated	
KIB:							
Kinco----------	80	Somewhat limited		Not limited		Not limited	
		Unstable excavation walls	0.40				
		High shrink-swell	0.01				
LGC:							
Lingua----------	70	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.04	Too clayey	0.04	Too clayey	0.04
LIF:							
Lingua----------	55	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.04	Too clayey	0.04	Too clayey	0.04

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
Ohtwo----------	30	Very limited		Very limited		Very Limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Unstable excavation walls	0.50	Too gravelly	0.87	Too gravelly	0.87
		High shrink-swell	0.19	Large stones	0.16	Large stones	0.16
		Large stones	0.16	Too clayey	0.11	Too clayey	0.11
		Too clayey	0.11	Very high shrink-swell	0.06	Very high shrink-swell	0.05
MAE:							
Manzanillo----------	65	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.65	Too gravelly	0.81	Too gravelly	0.81
		Unstable excavation walls	0.10	Slope	0.65	Slope	0.65
Paisano----------	30	Somewhat limited		Very limited		Very Limited	
		Slope	0.65	Too gravelly	1.00	Too gravelly	1.00
		High shrink-swell	0.50	Slope	0.65	Slope	0.65
		Unstable excavation walls	0.40				
MBE:							
Manzanillo----------	40	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.78	Too gravelly	0.81	Too gravelly	0.81
		Unstable excavation walls	0.10	Slope	0.78	Slope	0.78
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
Chilicotal----------	25	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.78	Too gravelly	0.99	Too gravelly	0.85
		Unstable excavation walls	0.40	Slope	0.78	Slope	0.78
		Large stones	0.05	Large stones	0.05	Large stones	0.05
		Too clayey	0.03	Too clayey	0.03	Too clayey	0.03
		High shrink-swell	0.01				
Holguin----------	20	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.78	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Slope	0.78	Slope	0.78
MCA:							
Marfa----------	92	Somewhat limited		Somewhat limited		Somewhat limited	
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Unstable excavation walls	0.40	Very high shrink-swell	0.06	Very high shrink-swell	0.05
		High shrink-swell	0.17				

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
MDE:							
Mariscal----------	80	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.39	Large stones	0.39	Large stones	0.39
		Unstable excavation walls	0.10				
Rock outcrop--------	15	Not rated		Not rated		Not rated	
MOA:							
Martillo----------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.93	Too clayey	0.93	Too clayey	0.93
		High shrink-swell	0.41	Very high shrink-swell	0.13	Very high shrink-swell	0.11
		Unstable excavation walls	0.10				
Butcherknife--------	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.89	Too clayey	0.89	Too clayey	0.89
		Unstable excavation walls	0.40	Excess salt	0.50	Excess salt	0.50
		High shrink-swell	0.14	Very high shrink-swell	0.22	Very high shrink-swell	0.17
MPB:							
Melado----------	54	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.82	Too clayey	0.82	Too clayey	0.82
		High shrink-swell	0.50	Excess salt	0.50	Excess salt	0.50
		Unstable excavation walls	0.10	Very high shrink-swell	0.22	Very high shrink-swell	0.21
Pantera----------	38	Somewhat limited		Very limited		Very Limited	
		Too clayey	0.82	Too gravelly	1.00	Too gravelly	1.00
		Occasional flooding	0.70	Too clayey	0.82	Too clayey	0.82
		Unstable excavation walls	0.40	Occasional flooding	0.70	Occasional flooding	0.70
				Very high shrink-swell	0.01	Very high shrink-swell	0.01
MUB:							
Murray----------	58	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Too clayey	0.06	Too clayey	0.06
		Too clayey	0.06				
		High shrink-swell	0.01				
Marfa----------	21	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.63	Too clayey	0.63	Too clayey	0.63
		Unstable excavation walls	0.40	Very high shrink-swell	0.06	Very high shrink-swell	0.05
		High shrink-swell	0.17				

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines		Fencing, Post Depth Less Than 24 inches		Fencing, Post Depth Less Than 36 inches	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Boracho----------	15	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.50	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.06	Too clayey	0.06	Too clayey	0.06
MZA:							
Musquiz----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.75	Too clayey	0.75	Too clayey	0.75
		High shrink-swell	0.47	Very high shrink-swell	0.15	Very high shrink-swell	0.12
		Unstable excavation walls	0.10				
NLA:							
Nillo----------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.89	Too clayey	0.89	Too clayey	0.89
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		High shrink-swell	0.39	Very high shrink-swell	0.06	Very high shrink-swell	0.06
		Unstable excavation walls	0.10				
NPB:							
Nolam----------	55	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.40	Too gravelly	1.00	Too gravelly	1.00
		High shrink-swell	0.09	Too clayey	0.06	Too clayey	0.06
		Too clayey	0.06	Very high shrink-swell	0.04	Very high shrink-swell	0.04
Paisano----------	25	Somewhat limited		Very limited		Very Limited	
		Unstable excavation walls	0.50	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02
PAC:							
Paisano----------	80	Somewhat limited		Somewhat limited		Somewhat Limited	
		High shrink-swell	0.50	Too gravelly	0.98	Too gravelly	0.98
		Unstable excavation walls	0.40				
PAD:							
Paisano----------	80	Somewhat limited		Somewhat limited		Somewhat Limited	
		High shrink-swell	0.50	Too gravelly	0.98	Too gravelly	0.98
		Unstable excavation walls	0.40				
PIB:							
Paisano----------	55	Somewhat limited		Somewhat limited		Somewhat Limited	
		High shrink-swell	0.50	Too gravelly	0.98	Too gravelly	0.98
		Unstable excavation walls	0.40				

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines		Fencing, Post Depth Less Than 24 inches		Fencing, Post Depth Less Than 36 inches	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Musgrave----------	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		High shrink-swell	0.50	Depth to paralithic bedrock	0.08	Depth to paralithic bedrock	0.36
		Unstable excavation walls	0.10	Very high shrink-swell	0.01	Very high shrink-swell	0.01
		Depth to paralithic bedrock	0.08				
PKD:							
Pantak----------	46	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too clayey	0.23	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Too clayey	0.23	Too clayey	0.23
				Too acid	0.04	Too acid	0.04
Lingua----------	35	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too clayey	0.22	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Too clayey	0.22	Too clayey	0.22
PKE:							
Pantak----------	36	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.94	Slope	0.94	Slope	0.94
		Too clayey	0.23	Too gravelly	0.84	Too gravelly	0.84
		Unstable excavation walls	0.10	Too clayey	0.23	Too clayey	0.23
Lingua----------	24	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.94	Slope	0.94	Slope	0.94
		Unstable excavation walls	0.10	Large stones	0.82	Large stones	0.82
		Large stones	0.08	Large stones	0.08	Large stones	0.08
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02
Rock outcrop--------	19	Not rated		Not rated		Not rated	
PTA:							
Phantom----------	86	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.84	Too clayey	0.84	Too clayey	0.84
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		Unstable excavation walls	0.70	Very high shrink-swell	0.21	Very high shrink-swell	0.21
		High shrink-swell	0.50				

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines		Fencing, Post Depth Less Than 24 inches		Fencing, Post Depth Less Than 36 inches	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PZB:							
Phantom----------	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.97	Too clayey	0.97	Too clayey	0.97
		Unstable excavation walls	0.70	Very high shrink-swell	0.22	Very high shrink-swell	0.21
		High shrink-swell	0.50				
Musquiz----------	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.45	Too clayey	0.45	Too clayey	0.45
		Unstable excavation walls	0.10	Very high shrink-swell	0.06	Very high shrink-swell	0.03
		High shrink-swell	0.01				
QBE:							
Quadria----------	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.93	Too clayey	0.93	Too clayey	0.93
		High shrink-swell	0.50	Excess salt	0.50	Excess salt	0.50
		Unstable excavation walls	0.40	Very high shrink-swell	0.18	Very high shrink-swell	0.19
Nolam----------	30	Somewhat limited		Very limited		Very Limited	
		Too clayey	0.82	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.40	Too clayey	0.82	Too clayey	0.82
		High shrink-swell	0.39	Large stones	0.26	Large stones	0.26
		Large stones	0.26	Very high shrink-swell	0.06	Very high shrink-swell	0.06
Musgrave----------	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.94	Slope	0.94	Slope	0.94
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		High shrink-swell	0.50	Depth to paralithic bedrock	0.08	Depth to paralithic bedrock	0.36
		Unstable excavation walls	0.10	Very high shrink-swell	0.01	Very high shrink-swell	0.01
		Depth to paralithic bedrock	0.08				
RCE:							
Redford----------	52	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Slope	1.00	Slope	1.00
Corazones----------	32	Very limited		Very limited		Very Limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Unstable excavation walls	0.40	Too gravelly	0.99	Too gravelly	0.99
		High shrink-swell	0.01				

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
RCG:							
Redford	54	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
Corazones	36	Very limited		Very limited		Very Limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Unstable excavation walls	0.40	Too gravelly	0.99	Too gravelly	0.99
		High shrink-swell	0.01				
RED:							
Redlight	45	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Unstable excavation walls	0.10	Too gravelly	0.84	Too gravelly	0.84
Terlingua	15	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.65	Too gravelly	0.83	Too gravelly	0.83
		Unstable excavation walls	0.10	Slope	0.65	Slope	0.65
Rock outcrop	24	Not rated		Not rated		Not rated	
REE:							
Reduff	30	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.94	Large stones	1.00	Large stones	1.00
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.06	Slope	0.94	Slope	0.94
				Too clayey	0.06	Too clayey	0.06
Scotal	30	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.94	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.11	Slope	0.94	Slope	0.94
		Unstable excavation walls	0.10	Too clayey	0.11	Too clayey	0.11
Holguin	25	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.84	Too gravelly	0.97	Too gravelly	0.97
		Unstable excavation walls	0.10	Large stones	0.84	Large stones	0.84

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
RIA:							
Riverwash----------	50	Not rated		Not rated		Not rated	
Pantera----------	36	Very limited		Very limited		Very Limited	
		Frequent flooding	1.00	Frequent flooding	1.00	Frequent flooding	1.00
		Unstable excavation walls	0.40	Too gravelly	1.00	Too gravelly	1.00
		High shrink-swell	0.01	Too Sandy	0.50	Too Sandy	0.50
RMB:							
Rockhouse----------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Occasional flooding	0.70	Too gravelly	0.83	Too gravelly	0.83
		Unstable excavation walls	0.40	Occasional flooding	0.70	Occasional flooding	0.70
		Too clayey	0.03	Too clayey	0.03	Too clayey	0.03
		High shrink-swell	0.01				
Medley----------	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.40	Too clayey	0.07	Too clayey	0.07
		Too clayey	0.07				
		High shrink-swell	0.01				
SCB:							
Sanmoss----------	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.40	Too gravelly	0.97	Too gravelly	0.97
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
Medley----------	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.40	Very high shrink-swell	0.01	Too clayey	0.11
		High shrink-swell	0.34			Very high shrink-swell	0.01
SDC:							
Sauceda----------	60	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.54	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Large stones	0.54	Large stones	0.54
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
Boludo----------	20	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too clayey	0.11	Too clayey	0.11	Too clayey	0.11
		Unstable excavation walls	0.10	Too gravelly	0.03	Too gravelly	0.03
		Large stones	0.01	Large stones	0.01	Large stones	0.01

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines		Fencing, Post Depth Less Than 24 inches		Fencing, Post Depth Less Than 36 inches	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SEE:							
Sauceda----------	55	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.54	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Large stones	0.54	Large stones	0.54
		Slope	0.06	Slope	0.06	Slope	0.06
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
Decoty----------	40	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	0.45	Too gravelly	0.45
		Large stones	0.08	Large stones	0.08	Large stones	0.08
		Slope	0.06	Slope	0.06	Slope	0.06
SHC:							
Scotal----------	50	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too clayey	0.11	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Too clayey	0.11	Too clayey	0.11
Holguin----------	35	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.84	Too gravelly	0.97	Too gravelly	0.97
		Unstable excavation walls	0.10	Large stones	0.84	Large stones	0.84
SHE:							
Scotal----------	65	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.99	Too gravelly	1.00	Too gravelly	1.00
		Slope	0.13	Large stones	0.99	Large stones	0.99
		Unstable excavation walls	0.10	Slope	0.13	Slope	0.13
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02
Rock outcrop--------	15	Not rated		Not rated		Not rated	
SIG:							
Scotal----------	40	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too clayey	0.11	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Too clayey	0.11	Too clayey	0.11

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
Ohtwo	30	Very limited		Very limited		Very Limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Unstable excavation walls	0.50	Too gravelly	0.87	Too gravelly	0.87
		Large stones	0.16	Large stones	0.16	Large stones	0.16
		Too clayey	0.11	Too clayey	0.11	Too clayey	0.11
		High shrink-swell	0.04	Very high shrink-swell	0.06	Very high shrink-swell	0.03
Rock outcrop	20	Not rated		Not rated		Not rated	
SRA:							
Straddlebug	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.73	Too clayey	0.73	Too clayey	0.73
		Rare flooding	0.50	Rare flooding	0.50	Rare flooding	0.50
		High shrink-swell	0.13	Very high shrink-swell	0.10	Very high shrink-swell	0.05
		Unstable excavation walls	0.10				
STE:							
Strawhouse	50	Somewhat limited		Somewhat limited		Very Limited	
		Unstable excavation walls	0.50	Too gravelly	0.93	Too gravelly	1.00
						Too clayey	0.03
Stillwell	35	Somewhat limited		Somewhat limited		Very Limited	
		Unstable excavation walls	0.40	Too gravelly	0.86	Too gravelly	1.00
		Slope	0.06	Slope	0.06	Slope	0.06
		High shrink-swell	0.01				
SUD:							
Studybutte	85	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.94	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Slope	0.94	Slope	0.94
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
SUE:							
Studybutte	60	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.94	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Slope	0.94	Slope	0.94
Rock outcrop	25	Not rated		Not rated		Not rated	

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines: Rating class and limiting features	Value	Fencing, Post Depth Less Than 24 inches: Rating class and limiting features	Value	Fencing, Post Depth Less Than 36 inches: Rating class and limiting features	Value
SUG:							
Studybutte----------	60	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
TEA:							
Tenneco----------	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Rare flooding	0.50	Rare flooding	0.50	Rare flooding	0.50
		Unstable excavation walls	0.40	Too clayey	0.06	Too clayey	0.14
		High shrink-swell	0.35	Very high shrink-swell	0.02	Very high shrink-swell	0.03
		Too clayey	0.06				
Bodecker----------	15	Somewhat limited		Very limited		Very Limited	
		Occasional flooding	0.70	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.40	Occasional flooding	0.70	Occasional flooding	0.70
		High shrink-swell	0.11	Too clayey	0.01	Too clayey	0.01
		Too clayey	0.01	Very high shrink-swell	0.01	Very high shrink-swell	0.01
TRE:							
Terlingua----------	70	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.78	Slope	0.78	Slope	0.78
		Unstable excavation walls	0.10	Too gravelly	0.69	Too gravelly	0.69
Rock outcrop--------	25	Not rated		Not rated		Not rated	
TRG:							
Terlingua----------	65	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	0.99	Too gravelly	0.99
Rock outcrop--------	30	Not rated		Not rated		Not rated	
VAA:							
Verhalen----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.90	Too clayey	0.82	Too clayey	0.82
		Too clayey	0.82	Rare flooding	0.50	Rare flooding	0.50
		Rare flooding	0.50	Very high shrink-swell	0.22	Very high shrink-swell	0.21
		High shrink-swell	0.50				

Table 15.--Excavations for Plastic Pipelines and Fencing Depths--Continued

Map symbol and soil name	Pct. of map unit	Excavations to 24 inches for Plastic Pipelines		Fencing, Post Depth Less Than 24 inches		Fencing, Post Depth Less Than 36 inches	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VCA:							
Vicente	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		Unstable excavation walls	0.10	Too clayey	0.04	Too clayey	0.04
		Too clayey	0.04	Very high shrink-swell	0.01	Very high shrink-swell	0.01
		High shrink-swell	0.01				
Lomapelona	29	Somewhat limited		Somewhat limited		Somewhat limited	
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		Unstable excavation walls	0.10	Too clayey	0.02	Too clayey	0.02
		Too clayey	0.02				
		High shrink-swell	0.01				
Castolon	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		High shrink-swell	0.39	Too clayey	0.26	Too clayey	0.26
		Too clayey	0.26	Very high shrink-swell	0.06	Very high shrink-swell	0.06
		Unstable excavation walls	0.10				
VOC:							
Volco	45	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.06	Too clayey	0.06	Too clayey	0.06
Pardo	45	Very limited		Very limited		Very Limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too clayey	0.11	Too gravelly	0.63	Too gravelly	0.63
		Unstable excavation walls	0.10	Too clayey	0.11	Too clayey	0.11
				Very high shrink-swell	0.01		
W:							
Water	100	Not rated		Not rated		Not rated	

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		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ALB:							
Altar	45	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Dusty	0.06	Gravel content	1.00
		Dusty	0.06	Gravel content	0.05	Slope	0.13
		Gravel content	0.05			Dusty	0.06
Bodecker	30	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Gravel content	0.99	Gravel content	1.00
		Gravel content	0.99	Too sandy	0.80	Too sandy	0.80
		Too sandy	0.80			Flooding	0.60
Riverwash	15	Not rated		Not rated		Not rated	
ANS:							
Area not surveyed	100	Not rated		Not rated		Not rated	
BAC:							
Baviza	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.37	Too sandy	0.37	Gravel content	0.62
						Slope	0.50
						Too sandy	0.37
Pantera	21	Very limited		Very limited		Very limited	
		Flooding	1.00	Too sandy	1.00	Too sandy	1.00
		Too sandy	1.00	Gravel content	0.78	Flooding	1.00
		Gravel content	0.78	Flooding	0.40	Gravel content	1.00
BEB:							
Berrend	72	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.16	Dusty	0.16	Dusty	0.16
						Slope	0.13
Espy	17	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Too sandy	0.32	Too sandy	0.32	Gravel content	0.47
						Too sandy	0.32
BIC:							
Bissett	65	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.32	Dusty	0.32	Slope	0.50
						Dusty	0.32
Rock outcrop	20	Not rated		Not rated		Not rated	
BIE:							
Bissett	60	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Dusty	0.32	Dusty	0.32	Dusty	0.32
Rock outcrop	25	Not rated		Not rated		Not rated	

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
BIG:							
Bissett----------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.32	Dusty	0.32	Dusty	0.32
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BLE:							
Blackgap----------	52	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.41	Dusty	0.41	Dusty	0.41
Rock outcrop--------	45	Not rated		Not rated		Not rated	
BLG:							
Blackgap----------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.41	Dusty	0.41	Dusty	0.41
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BNE:							
Bofecillos----------	47	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.10	Dusty	0.10	Dusty	0.10
Horsetrap----------	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Dusty	0.10	Dusty	0.10	Dusty	0.10
Rock outcrop--------	17	Not rated		Not rated		Not rated	
BNG:							
Bofecillos----------	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.97	Gravel content	0.97	Depth to bedrock	1.00
		Dusty	0.31	Dusty	0.31	Dusty	0.31
Rock outcrop--------	40	Not rated		Not rated		Not rated	
BOB:							
Boracho----------	60	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Dusty	0.12	Dusty	0.12	Dusty	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	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Espy	20	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	0.92	Gravel content	0.92	Depth to cemented pan	1.00
		Dusty	0.32	Dusty	0.32	Dusty	0.32
						Slope	0.13
BOC:							
Borunda	60	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Depth to bedrock	0.65
		Slow water movement	0.41	Slow water movement	0.41	Slope	0.50
						Dusty	0.50
						Slow water movement	0.41
Borunda, gravelly	20	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.43	Dusty	0.43	Gravel content	1.00
		Slow water movement	0.41	Slow water movement	0.41	Slope	0.50
		Gravel content	0.08	Gravel content	0.08	Depth to bedrock	0.46
						Dusty	0.43
BRD:							
Brewster	75	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Dusty	0.38	Dusty	0.38	Depth to bedrock	1.00
						Dusty	0.38
BRF:							
Brewster	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Dusty	0.32	Dusty	0.32	Dusty	0.32
Rock outcrop	15	Not rated		Not rated		Not rated	
BRG:							
Brewster	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.42	Large stones content	0.42	Gravel content	0.99
		Dusty	0.38	Dusty	0.38	Large stones content	0.42
						Dusty	0.38
Rock outcrop	25	Not rated		Not rated		Not rated	
BUD:							
Buckear	55	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Gravel content	0.99	Gravel content	0.99	Depth to bedrock	1.00
		Dusty	0.27	Dusty	0.27	Slope	1.00
						Dusty	0.27

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
Coyanosa----------	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
		Dusty	0.01	Dusty	0.01	Dusty	0.01
CAA:							
Castolon----------	79	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50			Dusty	0.50
CAG:							
Catto----------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.27	Dusty	0.27	Dusty	0.27
Buckear----------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Gravel content	0.99	Gravel content	0.99	Depth to bedrock	1.00
		Dusty	0.27	Dusty	0.27	Dusty	0.27
Rock outcrop--------	10	Not rated		Not rated		Not rated	
CIC:							
Chilicotal----------	80	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Dusty	0.27	Dusty	0.27	Dusty	0.27
						Slope	0.13
CID:							
Chilicotal----------	80	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
		Dusty	0.27	Dusty	0.27	Dusty	0.27
CLC:							
Chilicotal	61	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.18	Dusty	0.18	Gravel content	1.00
		Gravel content	0.07	Gravel content	0.07	Dusty	0.18
						Slope	0.13
Paisano----------	32	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Dusty	0.19	Dusty	0.19	Dusty	0.19
						Slope	0.13
CMC:							
Chilimol----------	45	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Dusty	0.34	Dusty	0.34	Slope	0.88
						Dusty	0.34

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	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Boracho----------	32	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Dusty	0.04	Dusty	0.04	Slope	0.88
						Dusty	0.04
Berrend----------	13	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.27	Dusty	0.27	Slope	0.88
						Dusty	0.27
CND:							
Chinati----------	54	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	0.99	Gravel content	0.99	Depth to cemented pan	1.00
		Dusty	0.30	Dusty	0.30	Slope	1.00
						Depth to bedrock	0.99
						Dusty	0.30
Boracho----------	19	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Dusty	0.36	Dusty	0.36	Slope	1.00
						Dusty	0.36
Berrend----------	12	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.16	Dusty	0.16	Slope	0.88
						Dusty	0.16
CNE:							
Chinati----------	50	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
		Dusty	0.07	Dusty	0.07	Depth to bedrock	0.54
						Dusty	0.07
Boracho----------	30	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
		Dusty	0.28	Dusty	0.28	Dusty	0.28
COC:							
Corazones----------	50	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.93	Gravel content	0.93	Gravel content	1.00
		Dusty	0.02	Dusty	0.02	Slope	0.88
						Dusty	0.02

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
Ojinaga----------	40	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Sodium content	1.00	Gravel content	1.00	Gravel content	1.00
		Gravel content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.04	Dusty	0.04	Slope	0.88
						Dusty	0.04
COE:							
Corazones----------	61	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Dusty	0.02	Dusty	0.02	Dusty	0.02
Ojinaga----------	26	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to cemented pan	1.00
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Dusty	0.28	Dusty	0.28	Dusty	0.28
CVC:							
Costavar----------	53	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	0.22	Gravel content	0.22	Gravel content	1.00
		Dusty	0.13	Dusty	0.13	Slope	0.50
						Dusty	0.13
Volco----------	19	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Gravel content	0.99	Gravel content	0.99	Depth to bedrock	1.00
		Dusty	0.31	Dusty	0.31	Slope	0.50
						Dusty	0.31
EEB:							
Espy----------	56	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Too sandy	0.32	Too sandy	0.32	Gravel content	0.50
						Too sandy	0.32
Eppenauer----------	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.09	Dusty	0.09	Dusty	0.09
		Too sandy	0.01	Too sandy	0.01	Too sandy	0.01
GAA:							
Galindo----------	76	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50	Too clayey	0.50	Dusty	0.50
		Too clayey	0.50	Slow water movement	0.41	Too clayey	0.50
		Slow water movement	0.41			Slow water movement	0.41

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
GEF:							
Geefour----------	45	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Salinity	1.00	Salinity	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Salinity	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
Geefour, eroded-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Salinity	1.00	Salinity	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Salinity	1.00
		Dusty	0.50	Dusty	0.50	Gravel content	0.56
		Too clayey	0.50	Too clayey	0.50	Dusty	0.50
GFF:							
Geefour----------	53	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Salinity	1.00	Salinity	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Salinity	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Dusty	0.44	Dusty	0.44	Dusty	0.44
Corazones----------	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	0.99	Gravel content	0.99	Gravel content	1.00
		Dusty	0.02	Dusty	0.02	Dusty	0.02
Ojinaga----------	13	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Sodium content	1.00	Gravel content	1.00	Slope	1.00
		Gravel content	1.00	Sodium content	1.00	Gravel content	1.00
		Slope	0.16	Slope	0.16	Sodium content	1.00
		Dusty	0.03	Dusty	0.03	Dusty	0.03
GMF:							
Geefour----------	49	Very limited		Very limited		Very limited	
		Sodium content	1.00	Slow water movement	1.00	Slow water movement	1.00
		Salinity	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	1.00	Salinity	1.00	Salinity	1.00
		Slope	1.00	Too clayey	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00	Slope	1.00
Melado----------	31	Very limited		Very limited		Very limited	
		Sodium content	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slow water movement	1.00	Sodium content	1.00	Sodium content	1.00
		Salinity	1.00	Too clayey	1.00	Slope	1.00
		Too clayey	1.00	Salinity	1.00	Too clayey	1.00
		Dusty	0.50	Dusty	0.50	Salinity	1.00

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
GSA:							
Gemelo	60	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.08	Dusty	0.08	Gravel content	0.86
						Dusty	0.08
Straddlebug	25	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.85	Slow water movement	0.85	Slow water movement	0.85
		Dusty	0.41	Dusty	0.41	Dusty	0.41
HOB:							
Holguin	85	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	0.01	Too sandy	0.01	Slope	0.88
						Too sandy	0.01
HOD:							
Horsetrap	57	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Gravel content	0.61	Gravel content	0.61	Slope	1.00
		Dusty	0.14	Dusty	0.14	Depth to bedrock	1.00
						Dusty	0.14
Bofecillos	28	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Dusty	0.06	Dusty	0.06	Slope	1.00
						Dusty	0.06
Rock outcrop	10	Not rated		Not rated		Not rated	
KIB:							
Kinco	80	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.12	Gravel content	0.12	Gravel content	1.00
		Dusty	0.04	Dusty	0.04	Dusty	0.04
LGC:							
Lingua	70	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.22	Dusty	0.22	Slope	0.50
						Dusty	0.22
LIF:							
Lingua	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.22	Dusty	0.22	Dusty	0.22
Ohtwo	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Dusty	0.36	Dusty	0.36	Dusty	0.36

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
MAE:							
Manzanillo----------	65	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Gravel content	0.78	Gravel content	0.78	Depth to bedrock	1.00
		Dusty	0.02	Dusty	0.02	Dusty	0.02
Paisano----------	30	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	0.97	Gravel content	0.97	Slope	1.00
		Dusty	0.26	Dusty	0.26	Dusty	0.26
MBE:							
Manzanillo----------	40	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Gravel content	0.42	Gravel content	0.42	Depth to bedrock	1.00
		Dusty	0.09	Dusty	0.09	Dusty	0.09
Chilicotal----------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	0.98	Gravel content	0.98	Slope	1.00
		Dusty	0.11	Dusty	0.11	Dusty	0.11
		Large stones content	0.01	Large stones content	0.01	Large stones content	0.01
Holguin----------	20	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.01	Dusty	0.01	Dusty	0.01
MCA:							
Marfa----------	92	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.40	Flooding	0.60
		Dusty	0.40			Dusty	0.40
MDE:							
Mariscal----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.27	Dusty	0.27	Gravel content	1.00
		Gravel content	0.27	Gravel content	0.27	Dusty	0.27
		Large stones content	0.18	Large stones content	0.18	Large stones content	0.18
Rock outcrop--------	15	Not rated		Not rated		Not rated	

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
MOA:							
Martillo	60	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
		Dusty	0.46	Dusty	0.46	Dusty	0.46
Butcherknife	25	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.49	Dusty	0.49	Dusty	0.49
		Slow water movement	0.41	Slow water movement	0.41	Slow water movement	0.41
MPB:							
Melado	54	Very limited		Very limited		Very limited	
		Sodium content	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slow water movement	1.00	Sodium content	1.00	Sodium content	1.00
		Salinity	1.00	Too clayey	1.00	Too clayey	1.00
		Too clayey	1.00	Salinity	1.00	Salinity	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Pantera	38	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Gravel content	0.46	Gravel content	1.00
		Gravel content	0.46	Slow water movement	0.45	Flooding	0.60
		Slow water movement	0.45	Dusty	0.18	Slow water movement	0.45
		Dusty	0.18			Dusty	0.18
						Slope	0.13
MUB:							
Murray	58	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.19	Dusty	0.19	Dusty	0.19
Marfa	21	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.41	Dusty	0.41	Dusty	0.41
Boracho	15	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Dusty	0.31	Dusty	0.31	Dusty	0.31
MZA:							
Musquiz	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.41	Slow water movement	0.41	Gravel content	0.84
		Dusty	0.41	Dusty	0.41	Slow water movement	0.41
						Dusty	0.41

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
NLA:							
Nillo----------	90	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Flooding	1.00	Too clayey	0.50	Flooding	0.60
		Too clayey	0.50	Slow water movement	0.41	Too clayey	0.50
		Slow water movement	0.41	Dusty	0.40	Slow water movement	0.41
		Dusty	0.40			Dusty	0.40
NPB:							
Nolam----------	55	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.32	Gravel content	0.32	Gravel content	1.00
		Dusty	0.12	Dusty	0.12	Dusty	0.12
Paisano----------	25	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Dusty	0.07	Dusty	0.07	Dusty	0.07
PAC:							
Paisano----------	80	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	0.76	Gravel content	0.76	Depth to cemented pan	1.00
		Dusty	0.18	Dusty	0.18	Dusty	0.18
						Slope	0.13
PAD:							
Paisano----------	80	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	0.76	Gravel content	0.76	Depth to cemented pan	1.00
		Dusty	0.18	Dusty	0.18	Slope	1.00
						Dusty	0.18
PIB:							
Paisano----------	55	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	0.76	Gravel content	0.76	Depth to cemented pan	1.00
		Dusty	0.18	Dusty	0.18	Dusty	0.18
						Slope	0.13
Musgrave----------	35	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Sodium content	1.00
		Slow water movement	0.41	Slow water movement	0.41	Slope	0.50
		Dusty	0.39	Dusty	0.39	Gravel content	0.44
						Slow water movement	0.41

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	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
PKD:							
Pantak	46	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slow water movement	0.26	Slow water movement	0.26	Depth to bedrock	1.00
		Dusty	0.17	Dusty	0.17	Slow water movement	0.26
						Dusty	0.17
Lingua	35	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.22	Dusty	0.22	Slope	0.50
						Dusty	0.22
PKE:							
Pantak	36	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
		Dusty	0.17	Dusty	0.17	Dusty	0.17
Lingua	24	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.29	Dusty	0.29	Gravel content	1.00
		Large stones content	0.23	Large stones content	0.23	Dusty	0.29
		Gravel content	0.11	Gravel content	0.11	Large stones content	0.23
Rock outcrop	19	Not rated		Not rated		Not rated	
PTA:							
Phantom	86	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.46	Flooding	0.60
		Dusty	0.46	Slow water movement	0.41	Dusty	0.46
		Slow water movement	0.41			Slow water movement	0.41
PZB:							
Phantom	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.41	Slow water movement	0.41	Slow water movement	0.41
Musquiz	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.41	Slow water movement	0.41	Gravel content	0.84
		Dusty	0.37	Dusty	0.37	Slow water movement	0.41
						Dusty	0.37

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
QBE:							
Quadria	40	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.41	Slow water movement	0.41	Slow water movement	0.41
		Dusty	0.38	Dusty	0.38	Dusty	0.38
Nolam	30	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.38	Dusty	0.38	Gravel content	1.00
		Gravel content	0.26	Gravel content	0.26	Dusty	0.38
Musgrave	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Sodium content	1.00	Sodium content	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Sodium content	1.00
		Slow water movement	0.41	Slow water movement	0.41	Gravel content	0.44
		Dusty	0.39	Dusty	0.39	Slow water movement	0.41
RCE:							
Redford	52	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.04	Dusty	0.04	Dusty	0.04
Corazones	32	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Dusty	0.02	Dusty	0.02	Dusty	0.02
RCG:							
Redford	54	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.04	Dusty	0.04	Dusty	0.04
Corazones	36	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Dusty	0.02	Dusty	0.02	Dusty	0.02
RED:							
Redlight	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Gravel content	0.99	Gravel content	0.99	Depth to bedrock	1.00
		Dusty	0.03	Dusty	0.03	Dusty	0.03
Terlingua	15	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Dusty	0.04	Dusty	0.04	Dusty	0.04
Rock outcrop	24	Not rated		Not rated		Not rated	

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
REE:							
Reduff	30	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.32	Dusty	0.32	Dusty	0.32
Scotal	30	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.27	Dusty	0.27	Dusty	0.27
Holguin	25	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.05	Dusty	0.05	Slope	0.50
						Dusty	0.05
RIA:							
Riverwash	50	Not rated		Not rated		Not rated	
Pantera	36	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Gravel content	0.89	Flooding	1.00
		Gravel content	0.89	Flooding	0.40	Gravel content	1.00
RMB:							
Rockhouse	60	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.23	Flooding	0.60
		Dusty	0.23			Dusty	0.23
						Gravel content	0.06
Medley	27	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.28	Gravel content	0.28	Gravel content	1.00
		Dusty	0.13	Dusty	0.13	Dusty	0.13
						Slope	0.13
SCB:							
Sanmoss	65	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Dusty	0.28	Dusty	0.28	Dusty	0.28
						Slope	0.13
Medley	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.17	Dusty	0.17	Gravel content	1.00
		Gravel content	0.01	Gravel content	0.01	Dusty	0.17
						Slope	0.13
SDC:							
Sauceda	60	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.76	Large stones content	0.76	Large stones content	0.76
		Dusty	0.27	Dusty	0.27	Slope	0.50
						Dusty	0.27

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
Boludo----------	20	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Dusty	0.36	Dusty	0.36	Depth to bedrock	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slope	0.50
		Gravel content	0.02	Gravel content	0.02	Dusty	0.36
SEE:							
Sauceda----------	55	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Large stones content	0.76	Large stones content	0.76	Depth to bedrock	1.00
		Dusty	0.27	Dusty	0.27	Large stones content	0.76
		Slope	0.16	Slope	0.16	Dusty	0.27
Decoty----------	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Gravel content	0.97	Gravel content	0.97	Slope	1.00
		Slope	0.16	Slope	0.16	Depth to bedrock	1.00
		Dusty	0.15	Dusty	0.15	Dusty	0.15
SHC:							
Scotal----------	50	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.27	Dusty	0.27	Slope	0.88
						Dusty	0.27
Holguin----------	35	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.05	Dusty	0.05	Slope	0.50
						Dusty	0.05
SHE:							
Scotal----------	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.46	Large stones content	0.46	Slope	1.00
		Slope	0.37	Slope	0.37	Large stones content	0.46
		Dusty	0.28	Dusty	0.28	Gravel content	0.36
						Dusty	0.28
Rock outcrop--------	15	Not rated		Not rated		Not rated	
SIG:							
Scotal----------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.27	Dusty	0.27	Dusty	0.27

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
Ohtwo	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Dusty	0.36	Dusty	0.36	Dusty	0.36
Rock outcrop	20	Not rated		Not rated		Not rated	
SRA:							
Straddlebug	80	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Flooding	1.00	Slow water movement	0.85	Slow water movement	0.85
		Slow water movement	0.85	Dusty	0.41	Dusty	0.41
		Dusty	0.41				
STE:							
Strawhouse	50	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Dusty	0.14	Dusty	0.14	Slope	0.88
						Dusty	0.14
Stillwell	35	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Sodium content	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
		Too sandy	0.08	Too sandy	0.08	Too sandy	0.08
		Dusty	0.03	Dusty	0.03	Dusty	0.03
SUD:							
Studybutte	85	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Dusty	0.14	Dusty	0.14	Dusty	0.14
SUE:							
Studybutte	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.26	Dusty	0.26	Dusty	0.26
Rock outcrop	25	Not rated		Not rated		Not rated	
SUG:							
Studybutte	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.26	Dusty	0.26	Dusty	0.26
Rock outcrop	30	Not rated		Not rated		Not rated	

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	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
TEA:							
Tenneco----------	70	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.49	Dusty	0.49
		Dusty	0.49				
Bodecker----------	15	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.13	Flooding	0.60
		Dusty	0.13			Dusty	0.13
TRE:							
Terlingua----------	70	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Dusty	0.05	Dusty	0.05	Dusty	0.05
Rock outcrop--------	25	Not rated		Not rated		Not rated	
TRG:							
Terlingua----------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Gravel content	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Dusty	0.05	Dusty	0.05	Dusty	0.05
Rock outcrop--------	30	Not rated		Not rated		Not rated	
VAA:							
Verhalen----------	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Dusty	0.50
		Dusty	0.50	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				
VCA:							
Vicente----------	30	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.35	Flooding	0.60
		Dusty	0.35			Dusty	0.35
Lomapelona----------	29	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.18	Flooding	0.60
		Dusty	0.18			Dusty	0.18
Castolon----------	25	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50			Dusty	0.50
VOC:							
Volco----------	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Gravel content	0.99	Gravel content	0.99	Depth to bedrock	1.00
		Dusty	0.31	Dusty	0.31	Slope	0.50
						Dusty	0.31

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
Pardo	45	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Dusty	0.36	Dusty	0.36	Depth to bedrock	1.00
		Gravel content	0.12	Gravel content	0.12	Slope	0.50
						Dusty	0.36
W:							
Water	100	Not rated		Not rated		Not rated	

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
ALB:							
Altar	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.06	Dusty	0.06	Droughty	0.99
						Dusty	0.06
						Gravel content	0.05
Bodecker	30	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.80	Too sandy	0.80	Droughty	1.00
						Gravel content	0.99
						Flooding	0.60
						Large stones content	0.20
Riverwash	15	Not rated		Not rated		Not rated	
ANS:							
Area not surveyed	100	Not rated		Not rated		Not rated	
BAC:							
Baviza	75	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.37	Too sandy	0.37	Droughty	1.00
Pantera	21	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	1.00
						Droughty	1.00
						Gravel content	0.78
						Large stones content	0.20
BEB:							
Berrend	72	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.16	Dusty	0.16	Dusty	0.16
Espy	17	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.32	Too sandy	0.32	Depth to cemented pan	1.00
						Droughty	1.00
						Carbonate content	1.00
BIC:							
Bissett	65	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.32	Dusty	0.32	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.32
Rock outcrop	20	Not rated		Not rated		Not rated	

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
BIE:							
Bissett----------	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.32	Droughty	1.00
		Dusty	0.32			Depth to bedrock	1.00
						Gravel content	1.00
						Slope	1.00
						Carbonate content	1.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.32	Dusty	0.32	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
						Carbonate content	1.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BLE:							
Blackgap----------	52	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.41	Dusty	0.41	Droughty	1.00
		Slope	0.18			Too dense	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
						Slope	1.00
Rock outcrop--------	45	Not rated		Not rated		Not rated	
BLG:							
Blackgap----------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.41	Dusty	0.41	Droughty	1.00
						Too dense	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BNE:							
Bofecillos----------	47	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Dusty	0.10	Dusty	0.10	Droughty	1.00
						Gravel content	1.00
						Slope	1.00
						Dusty	0.10
Horsetrap----------	21	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.10	Dusty	0.10	Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
						Gravel content	1.00
						Large stones content	0.79
Rock outcrop--------	17	Not rated		Not rated		Not rated	

Table 17.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf course fairways: Rating class and limiting features	Value
BNG:							
Bofecillos----------	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Dusty	0.31	Depth to bedrock	1.00
		Dusty	0.31	Slope	0.22	Droughty	1.00
						Slope	1.00
						Gravel content	0.97
						Dusty	0.31
Rock outcrop--------	40	Not rated		Not rated		Not rated	
BOB:							
Boracho----------	60	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.12	Dusty	0.12	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel content	1.00
						Dusty	0.12
						Large stones content	0.01
Espy----------	20	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.32	Dusty	0.32	Depth to cemented pan	1.00
						Carbonate content	1.00
						Droughty	0.98
						Gravel content	0.92
						Dusty	0.32
BOC:							
Borunda----------	60	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
						Depth to bedrock	0.65
						Dusty	0.50
						Droughty	0.01
Borunda, gravelly---	20	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.43	Dusty	0.43	Sodium content	1.00
						Depth to bedrock	0.46
						Dusty	0.43
						Gravel content	0.08
BRD:							
Brewster----------	75	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.38	Dusty	0.38	Depth to bedrock	1.00
						Droughty	1.00
						Gravel content	1.00
						Dusty	0.38
BRF:							
Brewster----------	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.32	Depth to bedrock	1.00
		Dusty	0.32			Droughty	1.00
						Slope	1.00
						Gravel content	1.00
						Dusty	0.32
Rock outcrop--------	15	Not rated		Not rated		Not rated	

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
BRG:							
Brewster----------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Large stones content	0.42	Large stones content	0.42	Slope	1.00
		Dusty	0.38	Dusty	0.38	Droughty	1.00
						Large stones content	1.00
						Dusty	0.38
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BUD:							
Buckear----------	55	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.27	Dusty	0.27	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	0.99
						Dusty	0.27
						Large stones content	0.01
Coyanosa----------	35	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Dusty	0.01	Dusty	0.01	Droughty	1.00
						Gravel content	1.00
						Slope	0.37
						Dusty	0.01
CAA:							
Castolon----------	79	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
						Dusty	0.50
CAG:							
Catto----------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Gravel content	1.00	Slope	1.00
		Gravel content	1.00	Slope	0.96	Gravel content	1.00
		Dusty	0.27	Dusty	0.27	Droughty	1.00
						Depth to bedrock	1.00
						Dusty	0.27
Buckear----------	35	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Dusty	0.27	Slope	1.00
		Dusty	0.27			Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	0.99
						Dusty	0.27
Rock outcrop--------	10	Not rated		Not rated		Not rated	
CIC:							
Chilicotal----------	80	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.27	Dusty	0.27	Gravel content	1.00
						Dusty	0.27
						Droughty	0.01

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
CID:							
Chilicotal----------	80	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.27	Dusty	0.27	Gravel content	1.00
						Slope	0.37
						Dusty	0.27
						Droughty	0.01
CLC:							
Chilicotal----------	61	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.18	Dusty	0.18	Dusty	0.18
						Gravel content	0.07
						Droughty	0.06
						Large stones content	0.01
Paisano----------	32	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.19	Dusty	0.19	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.19
CMC:							
Chilimol----------	45	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.34	Dusty	0.34	Gravel content	1.00
						Dusty	0.34
Boracho----------	32	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.04	Dusty	0.04	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel content	1.00
						Large stones content	0.46
						Dusty	0.04
Berrend----------	13	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.27	Dusty	0.27	Dusty	0.27
CND:							
Chinati----------	54	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.30	Dusty	0.30	Depth to cemented pan	1.00
						Droughty	1.00
						Depth to bedrock	0.99
						Gravel content	0.99
						Dusty	0.30
Boracho----------	19	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.36	Dusty	0.36	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel content	1.00
						Dusty	0.36
Berrend----------	12	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.16	Dusty	0.16	Dusty	0.16

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
CNE:							
Chinati----------	50	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.07	Dusty	0.07	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel content	1.00
						Depth to bedrock	0.54
						Slope	0.16
Boracho----------	30	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.28	Dusty	0.28	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel content	1.00
						Slope	0.63
						Dusty	0.28
COC:							
Corazones----------	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.02	Dusty	0.02	Droughty	0.97
						Gravel content	0.93
						Dusty	0.02
Ojinaga----------	40	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.04	Dusty	0.04	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel content	1.00
						Sodium content	1.00
						Large stones content	0.05
COE:							
Corazones----------	61	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Dusty	0.02	Slope	1.00
		Dusty	0.02			Gravel content	1.00
						Droughty	0.67
						Dusty	0.02
Ojinaga----------	26	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Dusty	0.28	Depth to cemented pan	1.00
		Dusty	0.28			Droughty	1.00
						Slope	1.00
						Gravel content	1.00
						Dusty	0.28
CVC:							
Costavar----------	53	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.13	Dusty	0.13	Depth to bedrock	1.00
						Droughty	1.00
						Gravel content	0.22
						Dusty	0.13

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
Volco----------	19	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.31	Dusty	0.31	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	0.99
						Dusty	0.31
						Large stones content	0.08
EEB:							
Espy----------	56	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.32	Too sandy	0.32	Depth to cemented pan	1.00
						Droughty	1.00
Eppenauer----------	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.09	Dusty	0.09	Depth to bedrock	0.95
		Too sandy	0.01	Too sandy	0.01	Droughty	0.12
						Dusty	0.09
GAA:							
Galindo----------	76	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Too clayey	1.00
		Too clayey	0.50	Too clayey	0.50	Flooding	0.60
						Dusty	0.50
GEF:							
Geefour----------	45	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Droughty	1.00
		Dusty	0.49	Dusty	0.49	Depth to bedrock	1.00
		Slope	0.18			Gravel content	1.00
						Slope	1.00
						Too clayey	1.00
Geefour, eroded-----	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.50	Droughty	1.00
		Dusty	0.50	Too clayey	0.50	Depth to bedrock	1.00
		Too clayey	0.50			Slope	1.00
						Too clayey	1.00
						Salinity	1.00
GFF:							
Geefour----------	53	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Too clayey	0.50	Droughty	1.00
		Too clayey	0.50	Dusty	0.44	Depth to bedrock	1.00
		Dusty	0.44			Slope	1.00
						Too clayey	1.00
						Salinity	1.00
Corazones----------	21	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.02	Slope	1.00
		Dusty	0.02			Gravel content	0.99
						Droughty	0.53
						Dusty	0.02

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
Ojinaga----------	13	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.03	Dusty	0.03	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel content	1.00
						Sodium content	1.00
						Slope	0.16
GMF:							
Geefour----------	49	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Salinity	1.00
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
		Slope	0.18			Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
Melado----------	31	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Too clayey	1.00
						Salinity	1.00
						Dusty	0.50
						Droughty	0.36
GSA:							
Gemelo----------	60	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.08	Dusty	0.08	Sodium content	1.00
						Dusty	0.08
						Droughty	0.01
Straddlebug---------	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.41	Dusty	0.41	Sodium content	1.00
						Dusty	0.41
HOB:							
Holguin----------	85	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.01	Too sandy	0.01	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
HOD:							
Horsetrap----------	57	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.14	Dusty	0.14	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	0.61
						Dusty	0.14
Bofecillos----------	28	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Dusty	0.06	Dusty	0.06	Droughty	1.00
						Gravel content	1.00
						Dusty	0.06
Rock outcrop--------	10	Not rated		Not rated		Not rated	
KIB:							
Kinco----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.04	Dusty	0.04	Gravel content	0.12
						Dusty	0.04

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
LGC:							
Lingua----------	70	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.22	Dusty	0.22	Gravel content	1.00
						Droughty	1.00
						Depth to bedrock	1.00
						Dusty	0.22
LIF:							
Lingua----------	55	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.22	Slope	1.00
		Dusty	0.22	Dusty	0.22	Gravel content	1.00
						Droughty	1.00
						Depth to bedrock	1.00
						Dusty	0.22
Ohtwo----------	30	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Dusty	0.36	Slope	1.00
		Dusty	0.36	Slope	0.22	Gravel content	1.00
						Dusty	0.36
						Droughty	0.01
						Large stones content	0.01
MAE:							
Manzanillo----------	65	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.02	Dusty	0.02	Depth to cemented pan	1.00
						Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
						Gravel content	0.78
Paisano----------	30	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.26	Dusty	0.26	Depth to cemented pan	1.00
						Droughty	1.00
						Slope	1.00
						Carbonate content	1.00
						Gravel content	0.97
MBE:							
Manzanillo----------	40	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.09	Dusty	0.09	Depth to cemented pan	1.00
		Slope	0.02			Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
						Gravel content	0.42
Chilicotal----------	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.11	Dusty	0.11	Slope	1.00
		Slope	0.02	Large stones content	0.01	Large stones content	0.99
		Large stones content	0.01			Gravel content	0.98
						Droughty	0.92
						Dusty	0.11

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
Holguin----------	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.02	Dusty	0.01	Droughty	1.00
		Dusty	0.01			Depth to bedrock	1.00
						Gravel content	1.00
						Slope	1.00
						Dusty	0.01
MCA:							
Marfa----------	92	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.40	Dusty	0.40	Flooding	0.60
						Dusty	0.40
MDE:							
Mariscal----------	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.27	Droughty	1.00
		Dusty	0.27	Large stones content	0.18	Depth to bedrock	1.00
		Large stones content	0.18			Large stones content	1.00
						Slope	1.00
						Carbonate content	1.00
Rock outcrop--------	15	Not rated		Not rated		Not rated	
MOA:							
Martillo----------	60	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.46	Dusty	0.46	Sodium content	1.00
						Dusty	0.46
Butcherknife--------	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.49	Dusty	0.49	Sodium content	1.00
						Dusty	0.49
MPB:							
Melado----------	54	Very limited		Very limited		Very limited	
		Too clayey	1.00	Too clayey	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Too clayey	1.00
						Salinity	1.00
						Droughty	0.83
						Dusty	0.50
Pantera----------	38	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.18	Dusty	0.18	Droughty	1.00
						Flooding	0.60
						Gravel content	0.46
						Dusty	0.18
MUB:							
Murray----------	58	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.19	Dusty	0.19	Dusty	0.19
Marfa----------	21	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.41	Dusty	0.41	Dusty	0.41

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
Boracho----------	15	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.31	Dusty	0.31	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel content	1.00
						Dusty	0.31
MZA:							
Musquiz----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.41	Dusty	0.41	Dusty	0.41
NLA:							
Nillo----------	90	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Sodium content	1.00
		Dusty	0.40	Dusty	0.40	Too clayey	1.00
						Flooding	0.60
						Dusty	0.40
NPB:							
Nolam----------	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.12	Dusty	0.12	Droughty	0.35
						Gravel content	0.32
						Dusty	0.12
Paisano----------	25	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Dusty	0.07	Dusty	0.07	Droughty	1.00
						Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.07
PAC:							
Paisano----------	80	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.18	Dusty	0.18	Depth to cemented pan	1.00
						Droughty	1.00
						Carbonate content	1.00
						Gravel content	0.76
						Dusty	0.18
PAD:							
Paisano----------	80	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.18	Dusty	0.18	Depth to cemented pan	1.00
						Droughty	1.00
						Carbonate content	1.00
						Gravel content	0.76
						Dusty	0.18
PIB:							
Paisano----------	55	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.18	Dusty	0.18	Depth to cemented pan	1.00
						Droughty	1.00
						Carbonate content	1.00
						Gravel content	0.76
						Dusty	0.18

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
Musgrave----------	35	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.39	Dusty	0.39	Depth to bedrock	1.00
						Sodium content	1.00
						Dusty	0.39
						Droughty	0.07
PKD:							
Pantak----------	46	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.17	Dusty	0.17	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
						Dusty	0.17
Lingua----------	35	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Dusty	0.22	Dusty	0.22	Droughty	1.00
						Gravel content	1.00
						Large stones content	0.39
						Dusty	0.22
PKE:							
Pantak----------	36	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.18	Dusty	0.17	Droughty	1.00
		Dusty	0.17			Depth to bedrock	1.00
						Gravel content	1.00
						Slope	1.00
						Dusty	0.17
Lingua----------	24	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.29	Dusty	0.29	Depth to bedrock	1.00
		Large stones content	0.23	Large stones content	0.23	Droughty	1.00
		Slope	0.18			Large stones content	1.00
						Slope	1.00
						Dusty	0.29
Rock outcrop--------	19	Not rated		Not rated		Not rated	
PTA:							
Phantom----------	86	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.46	Dusty	0.46	Flooding	0.60
						Dusty	0.46
PZB:							
Phantom----------	45	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Too clayey	1.00
		Too clayey	0.50	Too clayey	0.50	Dusty	0.50
Musquiz----------	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.37	Dusty	0.37	Dusty	0.37
QBE:							
Quadria----------	40	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.38	Dusty	0.38	Sodium content	1.00
						Dusty	0.38

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
Nolam----------	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.38	Dusty	0.38	Droughty	0.66
						Dusty	0.38
						Gravel content	0.26
Musgrave----------	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.39	Dusty	0.39	Depth to bedrock	1.00
		Slope	0.18			Slope	1.00
						Sodium content	1.00
						Dusty	0.39
						Droughty	0.07
RCE:							
Redford----------	52	Very limited		Very limited		Very limited	
		Gravel content	1.00	Gravel content	1.00	Droughty	1.00
		Slope	0.50	Dusty	0.04	Depth to bedrock	1.00
		Dusty	0.04			Gravel content	1.00
						Slope	1.00
						Dusty	0.04
Corazones----------	32	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.02	Slope	1.00
		Dusty	0.02			Gravel content	1.00
						Droughty	0.67
						Dusty	0.02
RCG:							
Redford----------	54	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel content	1.00	Gravel content	1.00	Droughty	1.00
		Dusty	0.04	Dusty	0.04	Depth to bedrock	1.00
						Gravel content	1.00
						Dusty	0.04
Corazones----------	36	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.02	Dusty	0.02	Gravel content	1.00
						Droughty	0.64
						Dusty	0.02
RED:							
Redlight----------	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Dusty	0.03	Slope	1.00
		Dusty	0.03			Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	0.99
						Dusty	0.03
Terlingua----------	15	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.04	Dusty	0.04	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
						Slope	1.00
						Dusty	0.04
Rock outcrop--------	24	Not rated		Not rated		Not rated	

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
REE:							
Reduff----------	30	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.32	Dusty	0.32	Gravel content	1.00
		Slope	0.18			Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
						Dusty	0.32
Scotal----------	30	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.27	Dusty	0.27	Droughty	1.00
		Slope	0.18			Depth to bedrock	1.00
						Gravel content	1.00
						Slope	1.00
						Dusty	0.27
Holguin----------	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.05	Dusty	0.05	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
						Dusty	0.05
RIA:							
Riverwash----------	50	Not rated		Not rated		Not rated	
Pantera----------	36	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
						Droughty	1.00
						Gravel content	0.89
RMB:							
Rockhouse----------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.23	Dusty	0.23	Flooding	0.60
						Dusty	0.23
Medley----------	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.13	Dusty	0.13	Gravel content	0.28
						Dusty	0.13
SCB:							
Sanmoss----------	65	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.28	Dusty	0.28	Gravel content	1.00
						Dusty	0.28
Medley----------	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.17	Dusty	0.17	Dusty	0.17
						Gravel content	0.01
SDC:							
Sauceda----------	60	Somewhat limited		Somewhat limited		Very limited	
		Large stones content	0.76	Large stones content	0.76	Gravel content	1.00
		Dusty	0.27	Dusty	0.27	Droughty	1.00
						Depth to bedrock	1.00
						Dusty	0.27

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
Boludo----------	20	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.36	Dusty	0.36	Depth to cemented pan	1.00
		Large stones content	0.01	Large stones content	0.01	Droughty	1.00
						Depth to bedrock	1.00
						Large stones content	0.97
						Dusty	0.36
SEE:							
Sauceda----------	55	Somewhat limited		Somewhat limited		Very limited	
		Large stones content	0.76	Large stones content	0.76	Gravel content	1.00
		Dusty	0.27	Dusty	0.27	Droughty	1.00
						Depth to bedrock	1.00
						Dusty	0.27
						Slope	0.16
Decoty----------	40	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.15	Dusty	0.15	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	0.97
						Slope	0.16
						Dusty	0.15
SHC:							
Scotal----------	50	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.27	Dusty	0.27	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
						Dusty	0.27
Holguin----------	35	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.05	Dusty	0.05	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
						Dusty	0.05
SHE:							
Scotal----------	65	Somewhat limited		Somewhat limited		Very limited	
		Large stones content	0.46	Large stones content	0.46	Large stones content	1.00
		Dusty	0.28	Dusty	0.28	Droughty	1.00
						Depth to bedrock	1.00
						Slope	0.37
						Dusty	0.28
Rock outcrop--------	15	Not rated		Not rated		Not rated	
SIG:							
Scotal----------	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.78	Slope	1.00
		Dusty	0.27	Dusty	0.27	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
						Dusty	0.27

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
Ohtwo----------	30	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.56	Slope	1.00
		Dusty	0.36	Dusty	0.36	Gravel content	1.00
						Dusty	0.36
						Large stones content	0.01
Rock outcrop--------	20	Not rated		Not rated		Not rated	
SRA:							
Straddlebug---------	80	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.41	Dusty	0.41	Sodium content	1.00
						Dusty	0.41
STE:							
Strawhouse----------	50	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.14	Dusty	0.14	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.14
Stillwell----------	35	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.08	Too sandy	0.08	Sodium content	1.00
		Dusty	0.03	Dusty	0.03	Gravel content	1.00
						Carbonate content	1.00
						Droughty	0.97
						Slope	0.16
SUD:							
Studybutte----------	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.18	Dusty	0.14	Droughty	1.00
		Dusty	0.14			Depth to bedrock	1.00
						Gravel content	1.00
						Slope	1.00
						Dusty	0.14
SUE:							
Studybutte----------	60	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.26	Dusty	0.26	Droughty	1.00
		Slope	0.18			Depth to bedrock	1.00
						Slope	1.00
						Gravel content	1.00
						Dusty	0.26
Rock outcrop--------	25	Not rated		Not rated		Not rated	
SUG:							
Studybutte----------	60	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Dusty	0.26	Slope	1.00
		Dusty	0.26	Slope	0.22	Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	1.00
						Dusty	0.26
Rock outcrop--------	30	Not rated		Not rated		Not rated	

Table 17.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf course fairways: Rating class and limiting features	Value
TEA:							
Tenneco	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.49	Dusty	0.49	Dusty	0.49
Bodecker	15	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.13	Dusty	0.13	Flooding	0.60
						Droughty	0.15
						Dusty	0.13
TRE:							
Terlingua	70	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.05	Dusty	0.05	Depth to bedrock	1.00
		Slope	0.02			Droughty	1.00
						Slope	1.00
						Gravel content	1.00
						Large stones content	0.16
Rock outcrop	25	Not rated		Not rated		Not rated	
TRG:							
Terlingua	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.05	Dusty	0.05	Slope	1.00
						Droughty	1.00
						Gravel content	1.00
						Dusty	0.05
Rock outcrop	30	Not rated		Not rated		Not rated	
VAA:							
Verhalen	80	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Too clayey	1.00
		Too clayey	0.50	Too clayey	0.50	Dusty	0.50
VCA:							
Vicente	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.35	Dusty	0.35	Flooding	0.60
						Dusty	0.35
Lomapelona	29	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.18	Dusty	0.18	Flooding	0.60
						Dusty	0.18
Castolon	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
						Dusty	0.50
VOC:							
Volco	45	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.31	Dusty	0.31	Depth to bedrock	1.00
						Droughty	1.00
						Gravel content	0.99
						Dusty	0.31
						Large stones content	0.01

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
Pardo	45	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.36	Dusty	0.36	Depth to cemented pan	1.00
						Depth to bedrock	1.00
						Droughty	1.00
						Dusty	0.36
						Gravel content	0.12
W:							
Water	100	Not rated		Not rated		Not rated	

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles

(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	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
ALB:					
Altar	45	Not limited		Somewhat limited	
				Too gravelly	0.94
				Flooding	0.50
Bodecker	30	Somewhat limited		Very limited	
		Droughty	0.50	Flooding	1.00
		Too alkaline	0.32	Content of large stones	1.00
		Too gravelly, cobbly, or stony	0.11	Too gravelly	0.28
Riverwash	15	Not rated		Not rated	
ANS:					
Area not surveyed	100	Not rated		Not rated	
BAC:					
Baviza	75	Somewhat limited		Somewhat limited	
		Extreme soil temperatures	0.50	Too Sandy	0.50
		Droughty	0.50		
Pantera	21	Somewhat limited		Very limited	
		Sandy surface	0.50	Flooding	1.00
		Droughty	0.50	Too gravelly	0.21
		Extreme soil temperatures	0.50	Content of large stones	0.04
		Too alkaline	0.32		
		Too gravelly, cobbly, or stony	0.02		
BEB:					
Berrend	72	Not limited		Somewhat limited	
				Too clayey	0.11
Espy	17	Somewhat limited		Somewhat limited	
		Droughty	0.50	Cemented pan	0.92
BIC:					
Bissett	65	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.03	Too gravelly	0.17
Rock outcrop	20	Not rated		Not rated	
BIE:					
Bissett	60	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.03	Too gravelly	0.17

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
Rock outcrop--------	25	Not rated		Not rated	
BIG:					
Bissett----------	70	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.03	Too gravelly	0.17
Rock outcrop--------	25	Not rated		Not rated	
BLE:					
Blackgap----------	52	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
		Extreme soil temperatures	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.24	Too gravelly	0.10
Rock outcrop--------	45	Not rated		Not rated	
BLG:					
Blackgap----------	75	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
		Extreme soil temperatures	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.24	Too gravelly	0.10
Rock outcrop--------	20	Not rated		Not rated	
BNE:					
Bofecillos----------	47	Somewhat limited		Very limited	
		Too gravelly, cobbly, or stony	0.54	< 10" to Bedrock (Hard or Soft)	1.00
		Droughty	0.50	Too gravelly	1.00
Horsetrap----------	21	Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.82	Content of large stones	0.55
		Droughty	0.50	Too gravelly	1.00
				10-20" to Bedrock (Hard or Soft)	0.32
Rock outcrop--------	17	Not rated		Not rated	
BNG:					
Bofecillos----------	45	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.08	Content of large stones	0.08
Rock outcrop--------	40	Not rated		Not rated	

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants		Habitat for Burrowing Mammals and Reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BOB:					
Boracho----------	60	Somewhat limited		Somewhat limited	
		Droughty	0.50	Too gravelly	0.87
		Too gravelly, cobbly, or stony	0.16	Cemented pan	0.54
Espy----------	20	Not limited		Somewhat limited	
				Cemented pan	0.21
BOC:					
Borunda----------	60	Very limited		Very limited	
		Excess Sodium	1.00	Too clayey	1.00
		Excess salt	0.47		
Borunda, gravelly---	20	Somewhat limited		Very limited	
		Excess Sodium	0.83	Too clayey	1.00
		Excess salt	0.78		
BRD:					
Brewster----------	75	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.28	Too gravelly	0.59
BRF:					
Brewster----------	65	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.19	Too gravelly	0.27
				Too clayey	0.01
Rock outcrop--------	15	Not rated		Not rated	
BRG:					
Brewster----------	60	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
		Too gravelly, cobbly, or stony	0.40	10-20" to Bedrock (Hard or Soft)	0.99
Rock outcrop--------	25	Not rated		Not rated	
BUD:					
Buckear----------	55	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.02		
Coyanosa----------	35	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.42	Too gravelly	0.92

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
CAA:					
Castolon	79	Somewhat limited		Very limited	
		Extreme soil temperatures	0.50	Flooding	1.00
CAG:					
Catto	50	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.29	Too gravelly	0.89
				Too clayey	0.53
Buckear	35	Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.84
		Too gravelly, cobbly, or stony	0.02		
Rock outcrop	10	Not rated		Not rated	
CIC:					
Chilicotal	80	Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.03	Too gravelly	0.54
CID:					
Chilicotal	80	Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.03	Too gravelly	0.54
CLC:					
Chilicotal	61	Not limited		Very limited	
				Content of large stones	1.00
				Too gravelly	0.05
Paisano	32	Somewhat limited		Somewhat limited	
		Droughty	0.50	Too gravelly	0.68
		Too gravelly, cobbly, or stony	0.14	Cemented pan	0.05
				Content of large stones	0.01
CMC:					
Chilimol	45	Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.08	Too gravelly	0.32

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
Boracho	32	Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.57	Cemented pan	0.92
		Droughty	0.50	Too gravelly	0.66
				Content of large stones	0.44
Berrend	13	Not limited		Somewhat limited	
				Too clayey	0.11
CND:					
Chinati	54	Somewhat limited		Somewhat limited	
		Droughty	0.50	Cemented pan	0.92
		Too gravelly, cobbly, or stony	0.01		
Boracho	19	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
				Cemented pan	0.89
				Too gravelly	0.87
				Too clayey	0.11
Berrend	12	Not limited		Not limited	
CNE:					
Chinati	50	Somewhat limited		Very limited	
		Droughty	0.50	Cemented pan	1.00
		Too gravelly, cobbly, or stony	0.01	Too gravelly	0.61
Boracho	30	Somewhat limited		Very limited	
		Droughty	0.50	Cemented pan	1.00
		Too gravelly, cobbly, or stony	0.01	Too gravelly	0.90
COC:					
Corazones	50	Somewhat limited		Somewhat limited	
		Extreme soil temperatures	0.50	Too gravelly	0.96
Ojinaga	40	Somewhat limited		Somewhat limited	
		Droughty	0.50	Cemented pan	0.92
		Extreme soil temperatures	0.50	Too gravelly	0.87
		Too gravelly, cobbly, or stony	0.19		
COE:					
Corazones	61	Somewhat limited		Somewhat limited	
		Extreme soil temperatures	0.50	Too gravelly	0.29
		Too gravelly, cobbly, or stony	0.03		

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
Ojinaga	26	Somewhat limited		Somewhat limited	
		Extreme soil temperatures	0.50	Too gravelly	0.52
		Droughty	0.50	Cemented pan	0.32
		Too gravelly, cobbly, or stony	0.04		
CVC:					
Costavar	53	Somewhat limited		Somewhat limited	
		Droughty	0.50	Too gravelly	0.89
				10-20" to Bedrock (Hard or Soft)	0.80
				Too clayey	0.11
Volco	19	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.06	Content of large stones	1.00
EEB:					
Espy	56	Somewhat limited		Somewhat limited	
		Droughty	0.50	Cemented pan	0.32
Eppenauer	39	Not limited		Not limited	
GAA:					
Galindo	76	Somewhat limited		Very limited	
		Too clayey	0.50	Flooding	1.00
		Extreme soil temperatures	0.50	Too clayey	1.00
GEF:					
Geefour	45	Very limited		Very limited	
		Excess salt	1.00	Dense layer	1.00
		Too clayey	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Droughty	0.50	Too clayey	1.00
		Extreme soil temperatures	0.50	Too gravelly	0.32
		Too gravelly, cobbly, or stony	0.08		
Geefour, eroded	35	Very limited		Very limited	
		Excess salt	1.00	Dense layer	1.00
		Too clayey	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Droughty	0.50	Too clayey	1.00
		Extreme soil temperatures	0.50		

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants		Habitat for Burrowing Mammals and Reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GFF:					
Geefour	53	Very limited		Very limited	
		Excess salt	1.00	Too clayey	1.00
		Too clayey	0.50	Dense layer	0.95
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.95
		Extreme soil temperatures	0.50		
Corazones	21	Somewhat limited		Very limited	
		Extreme soil temperatures	0.50	Content of large stones	1.00
Ojinaga	13	Somewhat limited		Somewhat limited	
		Droughty	0.50	Too gravelly	0.87
		Extreme soil temperatures	0.50	Cemented pan	0.54
		Too gravelly, cobbly, or stony	0.19		
GMF:					
Geefour	49	Very limited		Very limited	
		Excess Sodium	1.00	Too clayey	1.00
		Excess salt	0.78	Dense layer	0.08
		Too clayey	0.50	10-20" to Bedrock (Hard or Soft)	0.08
		Extreme soil temperatures	0.50		
		Droughty	0.50		
Melado	31	Somewhat limited		Very limited	
		Excess salt	0.99	Too clayey	1.00
		Excess Sodium	0.94		
		Too clayey	0.50		
		Extreme soil temperatures	0.50		
GSA:					
Gemelo	60	Not limited		Somewhat limited	
				Too gravelly	0.32
Straddlebug	25	Somewhat limited		Very limited	
		Excess Sodium	0.94	Too clayey	1.00
		Too alkaline	0.68		
HOB:					
Holguin	85	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.31	Too gravelly	0.65

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
HOD:					
Horsetrap	57	Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.80
				Too gravelly	0.01
				Too clayey	0.01
Bofecillos	28	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.35	Too gravelly	0.95
				Too clayey	0.01
Rock outcrop	10	Not rated		Not rated	
KIB:					
Kinco	80	Not limited		Not limited	
LGC:					
Lingua	70	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.18	Too gravelly	0.68
LIF:					
Lingua	55	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.18	Too gravelly	0.68
Ohtwo	30	Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.07	Too gravelly	0.04
				Too clayey	0.01
MAE:					
Manzanillo	65	Somewhat limited		Very limited	
		Droughty	0.50	Cemented pan	1.00
		Too gravelly, cobbly, or stony	0.02	Content of large stones	0.96
				Too gravelly	0.02
				10-20" to Bedrock (Hard or Soft)	0.01
Paisano	30	Somewhat limited		Somewhat limited	
		Droughty	0.50	Cemented pan	0.92
				Too gravelly	0.32

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
MBE:					
Manzanillo----------	40	Somewhat limited		Somewhat limited	
		Droughty	0.50	Content of large stones	0.96
				Cemented pan	0.80
				10-20" to Bedrock (Hard or Soft)	0.26
				Too gravelly	0.02
Chilicotal----------	25	Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.56	Content of large stones	0.92
				Too gravelly	0.03
Holguin----------	20	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.03	Too gravelly	1.00
MCA:					
Marfa----------	92	Not limited		Very limited	
				Flooding	1.00
				Too clayey	0.99
MDE:					
Mariscal----------	80	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
		Extreme soil temperatures	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.47		
Rock outcrop--------	15	Not rated		Not rated	
MOA:					
Martillo----------	60	Very limited		Very limited	
		Excess Sodium	1.00	Too clayey	1.00
		Excess salt	0.01		
Butcherknife--------	25	Very limited		Very limited	
		Excess Sodium	1.00	Too clayey	1.00
		Excess salt	0.08		
MPB:					
Melado----------	54	Somewhat limited		Very limited	
		Excess salt	0.99	Too clayey	1.00
		Excess Sodium	0.94		
		Too clayey	0.50		
		Extreme soil temperatures	0.50		
Pantera----------	38	Somewhat limited		Very limited	
		Extreme soil temperatures	0.50	Flooding	1.00
		Droughty	0.50	Too gravelly	1.00

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
MUB:					
Murray	58	Not limited		Not limited	
Marfa	21	Not limited		Very limited	
				Too clayey	1.00
Boracho	15	Somewhat limited		Very limited	
		Droughty	0.50	Cemented pan	1.00
		Too gravelly, cobbly, or stony	0.01	Too gravelly	0.98
MZA:					
Musquiz	80	Not limited		Very limited	
				Too clayey	1.00
NLA:					
Nillo	90	Somewhat limited		Very limited	
		Too clayey	0.50	Flooding	1.00
NPB:					
Nolam	55	Not limited		Somewhat limited	
				Too gravelly	0.99
				Content of large stones	0.04
Paisano	25	Somewhat limited		Very limited	
		Too gravelly, cobbly, or stony	0.62	Too gravelly	1.00
		Droughty	0.50	Cemented pan	0.80
PAC:					
Paisano	80	Somewhat limited		Very limited	
		Droughty	0.50	Cemented pan	1.00
				Too gravelly	0.17
PAD:					
Paisano	80	Somewhat limited		Very limited	
		Droughty	0.50	Cemented pan	1.00
				Too gravelly	0.17
PIB:					
Paisano	55	Somewhat limited		Very limited	
		Droughty	0.50	Cemented pan	1.00
				Too gravelly	0.17
Musgrave	35	Somewhat limited		Somewhat limited	
		Excess Sodium	0.25	Too clayey	0.89
				Dense layer	0.05
				10-20" to Bedrock (Hard or Soft)	0.05
PKD:					
Pantak	46	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.02	Too gravelly	0.77
				Too clayey	0.31

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
Lingua	35	Somewhat limited		Very limited	
		Too gravelly, cobbly, or stony	0.80	< 10" to Bedrock (Hard or Soft)	1.00
		Droughty	0.50	Too gravelly	0.85
				Content of large stones	0.32
				Too clayey	0.30
PKE:					
Pantak	36	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.01	Too clayey	0.31
				Too gravelly	0.03
Lingua	24	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.41	Content of large stones	1.00
Rock outcrop	19	Not rated		Not rated	
PTA:					
Phantom	86	Not limited		Very limited	
				Flooding	1.00
				Too clayey	1.00
PZB:					
Phantom	45	Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	1.00
Musquiz	39	Not limited		Not limited	
QBE:					
Quadria	40	Very limited		Somewhat limited	
		Excess Sodium	1.00	Too clayey	0.30
		Excess salt	0.50	Content of large stones	0.14
Nolam	30	Not limited		Very limited	
				Content of large stones	1.00
				Too gravelly	0.93
Musgrave	25	Somewhat limited		Somewhat limited	
		Excess Sodium	0.25	Too clayey	0.89
				Dense layer	0.05
				10-20" to Bedrock (Hard or Soft)	0.05

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
RCE:					
Redford	52	Somewhat limited		Somewhat limited	
		Droughty	0.50	Too gravelly	0.84
		Extreme soil temperatures	0.50	10-20" to Bedrock (Hard or Soft)	0.68
		Too gravelly, cobbly, or stony	0.50		
Corazones	32	Somewhat limited		Somewhat limited	
		Extreme soil temperatures	0.50	Too gravelly	0.29
		Too gravelly, cobbly, or stony	0.03		
RCG:					
Redford	54	Somewhat limited		Somewhat limited	
		Droughty	0.50	Too gravelly	0.87
		Extreme soil temperatures	0.50	10-20" to Bedrock (Hard or Soft)	0.32
		Too gravelly, cobbly, or stony	0.49		
Corazones	36	Somewhat limited		Somewhat limited	
		Extreme soil temperatures	0.50	Too gravelly	0.29
		Too gravelly, cobbly, or stony	0.03		
RED:					
Redlight	45	Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.39
		Extreme soil temperatures	0.50	Too gravelly	0.03
Terlingua	15	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Extreme soil temperatures	0.50	Too gravelly	0.03
		Too gravelly, cobbly, or stony	0.04		
Rock outcrop	24	Not rated		Not rated	
REE:					
Reduff	30	Somewhat limited		Somewhat limited	
		Droughty	0.50	Content of large stones	0.86
		Too gravelly, cobbly, or stony	0.18	Too gravelly	0.68
				10-20" to Bedrock (Hard or Soft)	0.46

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
Scotal	30	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.20	Too gravelly	0.37
				Too clayey	0.01
Holguin	25	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
		Too gravelly, cobbly, or stony	0.04	Too gravelly	0.16
				10-20" to Bedrock (Hard or Soft)	0.01
RIA:					
Riverwash	50	Not rated		Not rated	
Pantera	36	Somewhat limited		Very limited	
		Droughty	0.50	Flooding	1.00
		Extreme soil temperatures	0.50	Too Sandy	0.50
		Too alkaline	0.32	Too gravelly	0.37
RMB:					
Rockhouse	60	Not limited		Very limited	
				Flooding	1.00
				Too gravelly	0.03
Medley	27	Not limited		Not limited	
SCB:					
Sanmoss	65	Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.02	Too gravelly	0.16
Medley	25	Not limited		Somewhat limited	
				Too clayey	0.01
SDC:					
Sauceda	60	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
		Too gravelly, cobbly, or stony	0.18	< 10" to Bedrock (Hard or Soft)	1.00
				Too gravelly	0.68
Boludo	20	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
		Too gravelly, cobbly, or stony	0.02	Cemented pan	0.97
				10-20" to Bedrock (Hard or Soft)	0.16
				Too clayey	0.01

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants		Habitat for Burrowing Mammals and Reptiles	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SEE:					
Sauceda	55	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
		Too gravelly, cobbly, or stony	0.18	< 10" to Bedrock (Hard or Soft)	1.00
				Too gravelly	0.68
Decoty	40	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
		Too gravelly, cobbly, or stony	0.04	10-20" to Bedrock (Hard or Soft)	0.61
SHC:					
Scotal	50	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.20	Too gravelly	0.37
				Too clayey	0.01
Holguin	35	Somewhat limited		Very limited	
		Droughty	0.50	Content of large stones	1.00
		Too gravelly, cobbly, or stony	0.04	Too gravelly	0.16
				10-20" to Bedrock (Hard or Soft)	0.01
SHE:					
Scotal	65	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.19	Too gravelly	1.00
Rock outcrop	15	Not rated		Not rated	
SIG:					
Scotal	40	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Too gravelly, cobbly, or stony	0.22	Too gravelly	0.44
				Too clayey	0.01
Ohtwo	30	Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.07	Too gravelly	0.04
				Too clayey	0.01
Rock outcrop	20	Not rated		Not rated	
SRA:					
Straddlebug	80	Somewhat limited		Very limited	
		Excess Sodium	0.94	Too clayey	1.00
		Too alkaline	0.68	Flooding	0.50

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
STE:					
Strawhouse	50	Somewhat limited		Very limited	
		Droughty	0.50	Cemented pan	1.00
		Extreme soil temperatures	0.50	Too gravelly	0.54
		Too gravelly, cobbly, or stony	0.06		
Stillwell	35	Somewhat limited		Very limited	
		Extreme soil temperatures	0.50	Too gravelly	1.00
		Too gravelly, cobbly, or stony	0.02		
SUD:					
Studybutte	85	Somewhat limited		Very limited	
		Droughty	0.50	Too gravelly	1.00
		Extreme soil temperatures	0.50	Excess humus	1.00
		Too gravelly, cobbly, or stony	0.26	< 10" to Bedrock (Hard or Soft)	0.99
SUE:					
Studybutte	60	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Extreme soil temperatures	0.50	Too gravelly	1.00
		Too gravelly, cobbly, or stony	0.14		
Rock outcrop	25	Not rated		Not rated	
SUG:					
Studybutte	60	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Extreme soil temperatures	0.50	Too gravelly	1.00
		Too gravelly, cobbly, or stony	0.14		
Rock outcrop	30	Not rated		Not rated	
TEA:					
Tenneco	70	Not limited		Somewhat limited	
				Flooding	0.50
Bodecker	15	Not limited		Very limited	
				Flooding	1.00
				Too gravelly	0.61

Table 18.--Desertic Herbaceous Plants, and Habitat for Burrowing Mammals and Reptiles--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Habitat for Burrowing Mammals and Reptiles: Rating class and limiting features	Value
TRE:					
Terlingua	70	Somewhat limited		Very limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00
		Extreme soil temperatures	0.50	Content of large stones	0.04
		Too gravelly, cobbly, or stony	0.12		
Rock outcrop	25	Not rated		Not rated	
TRG:					
Terlingua	65	Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.84
		Extreme soil temperatures	0.50	Too gravelly	0.22
		Too gravelly, cobbly, or stony	0.16		
Rock outcrop	30	Not rated		Not rated	
VAA:					
Verhalen	80	Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	1.00
		Excess salt	0.01	Flooding	0.50
VCA:					
Vicente	30	Somewhat limited		Very limited	
		Extreme soil temperatures	0.50	Flooding	1.00
Lomapelona	29	Somewhat limited		Very limited	
		Extreme soil temperatures	0.50	Flooding	1.00
Castolon	25	Somewhat limited		Very limited	
		Extreme soil temperatures	0.50	Flooding	1.00
VOC:					
Volco	45	Somewhat limited		Somewhat limited	
		Droughty	0.50	Too gravelly	0.73
		Too gravelly, cobbly, or stony	0.02	10-20" to Bedrock (Hard or Soft)	0.05
Pardo	45	Somewhat limited		Somewhat limited	
		Droughty	0.50	Content of large stones	0.56
				Cemented pan	0.46
				10-20" to Bedrock (Hard or Soft)	0.05
				Too clayey	0.01
W:					
Water	100	Not rated		Not rated	

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines

(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		Upland Desertic Shrubs and Trees		Upland Shrubs and Vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ALB:							
Altar	45	Not limited		Not limited		Not limited	
Bodecker	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Sandy surface	0.60	Sandy surface	0.60	Sandy surface	0.60
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.11	Too alkaline	0.32	Too gravelly, cobbly, or stony	0.11
				Too gravelly, cobbly, or stony	0.11		
Riverwash	15	Not rated		Not rated		Not rated	
ANS:							
Area not surveyed	100	Not rated		Not rated		Not rated	
BAC:							
Baviza	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Sandy surface	0.60	Sandy surface	0.60	Sandy surface	0.60
		Droughty	0.50	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Droughty	0.50	Droughty	0.50
Pantera	21	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Sandy surface	0.40	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
		Too gravelly, cobbly, or stony	0.02	Sandy surface	0.40	Sandy surface	0.40
				Too alkaline	0.32	Too gravelly, cobbly, or stony	0.02
				Too gravelly, cobbly, or stony	0.02		
BEB:							
Berrend	72	Not limited		Not limited		Not limited	
Espy	17	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.90
						Droughty	0.50
BIC:							
Bissett	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03	Bedrock	0.04
						Too gravelly, cobbly, or stony	0.03
Rock outcrop	20	Not rated		Not rated		Not rated	
BIE:							
Bissett	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03	Bedrock	0.04
						Too gravelly, cobbly, or stony	0.03

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03	Bedrock	0.04
						Too gravelly, cobbly, or stony	0.03
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BLE:							
Blackgap----------	52	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.24	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.24	Too gravelly, cobbly, or stony	0.24
						Bedrock	0.04
Rock outcrop--------	45	Not rated		Not rated		Not rated	
BLG:							
Blackgap----------	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.24	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.24	Too gravelly, cobbly, or stony	0.24
						Bedrock	0.04
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BNE:							
Bofecillos----------	47	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.54	Too gravelly, cobbly, or stony	0.54	Too gravelly, cobbly, or stony	0.54
		Droughty	0.50	Droughty	0.50	Droughty	0.50
Horsetrap----------	21	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.82	Too gravelly, cobbly, or stony	0.82	Too gravelly, cobbly, or stony	0.82
		Droughty	0.50	Droughty	0.50	Droughty	0.50
						Bedrock	0.22
Rock outcrop--------	17	Not rated		Not rated		Not rated	
BNG:							
Bofecillos----------	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.08	Too gravelly, cobbly, or stony	0.08	Too gravelly, cobbly, or stony	0.08
						Bedrock	0.01
Rock outcrop--------	40	Not rated		Not rated		Not rated	

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
BOB:							
Boracho	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.82
		Too gravelly, cobbly, or stony	0.16	Too gravelly, cobbly, or stony	0.16	Droughty	0.50
						Too gravelly, cobbly, or stony	0.16
Espy	20	Not limited		Not limited		Somewhat limited	
						Cemented pan	0.75
BOC:							
Borunda	60	Very limited		Very limited		Very limited	
		Excess sodium	1.00	Excess Sodium	1.00	Excess Sodium	1.00
		Excess salt	0.47	Excess salt	0.47	Bedrock	0.79
						Excess salt	0.47
Borunda, gravelly	20	Very limited		Somewhat limited		Somewhat limited	
		Excess sodium	1.00	Excess Sodium	0.83	Bedrock	0.86
		Excess salt	0.78	Excess salt	0.78	Excess Sodium	0.83
						Excess salt	0.78
BRD:							
Brewster	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.28	Too gravelly, cobbly, or stony	0.28	Too gravelly, cobbly, or stony	0.28
BRF:							
Brewster	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.19	Too gravelly, cobbly, or stony	0.19	Too gravelly, cobbly, or stony	0.19
Rock outcrop	15	Not rated		Not rated		Not rated	
BRG:							
Brewster	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.40	Too gravelly, cobbly, or stony	0.40	Too gravelly, cobbly, or stony	0.40
						Bedrock	0.07
Rock outcrop	25	Not rated		Not rated		Not rated	
BUD:							
Buckear	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.02	Too gravelly, cobbly, or stony	0.02	Too gravelly, cobbly, or stony	0.02
						Bedrock	0.02
Coyanosa	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.42	Too gravelly, cobbly, or stony	0.42	Too gravelly, cobbly, or stony	0.42
						Bedrock	0.02

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
CAA:							
Castolon	79	Not limited		Somewhat limited		Somewhat limited	
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
CAG:							
Catto	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.29	Too gravelly, cobbly, or stony	0.29	Too gravelly, cobbly, or stony	0.29
						Bedrock	0.02
Buckear	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.02	Too gravelly, cobbly, or stony	0.02	Bedrock	0.12
						Too gravelly, cobbly, or stony	0.02
Rock outcrop	10	Not rated		Not rated		Not rated	
CIC:							
Chilicotal	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03
CID:							
Chilicotal	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03
CLC:							
Chilicotal	61	Somewhat limited		Not limited		Not limited	
		Excess sodium	0.32				
Paisano	32	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.68
		Too gravelly, cobbly, or stony	0.14	Too gravelly, cobbly, or stony	0.14	Droughty	0.50
						Too gravelly, cobbly, or stony	0.14
CMC:							
Chilimol	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.08	Too gravelly, cobbly, or stony	0.08	Too gravelly, cobbly, or stony	0.08
Boracho	32	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.57	Too gravelly, cobbly, or stony	0.57	Cemented pan	0.90
		Droughty	0.50	Droughty	0.50	Too gravelly, cobbly, or stony	0.57
						Droughty	0.50
Berrend	13	Not limited		Not limited		Not limited	

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
CND:							
Chinati----------	54	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.90
		Too gravelly, cobbly, or stony	0.01	Too gravelly, cobbly, or stony	0.01	Droughty	0.50
						Bedrock	0.48
						Too gravelly, cobbly, or stony	0.01
Boracho----------	19	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.89
						Droughty	0.50
Berrend----------	12	Not limited		Not limited		Not limited	
CNE:							
Chinati----------	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.96
		Too gravelly, cobbly, or stony	0.01	Too gravelly, cobbly, or stony	0.01	Bedrock	0.83
						Droughty	0.50
						Too gravelly, cobbly, or stony	0.01
Boracho----------	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.96
		Too gravelly, cobbly, or stony	0.01	Too gravelly, cobbly, or stony	0.01	Droughty	0.50
						Too gravelly, cobbly, or stony	0.01
COC:							
Corazones----------	50	Not limited		Somewhat limited		Somewhat limited	
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
Ojinaga----------	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.90
		Too gravelly, cobbly, or stony	0.19	Extreme soil temperatures	0.50	Droughty	0.50
				Too gravelly, cobbly, or stony	0.19	Extreme soil temperatures	0.50
						Too gravelly, cobbly, or stony	0.19
COE:							
Corazones----------	61	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.03	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03
Ojinaga----------	26	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Extreme soil temperatures	0.50	Cemented pan	0.78
		Too gravelly, cobbly, or stony	0.04	Droughty	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.04	Droughty	0.50
						Too gravelly, cobbly, or stony	0.04

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
CVC:							
Costavar	53	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
						Bedrock	0.13
Volco	19	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.06	Too gravelly, cobbly, or stony	0.06	Too gravelly, cobbly, or stony	0.06
						Bedrock	0.04
EEB:							
Espy	56	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.78
						Droughty	0.50
Eppenauer	39	Not limited		Not limited		Somewhat limited	
						Bedrock	0.56
GAA:							
Galindo	76	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
GEF:							
Geefour	45	Very limited		Very limited		Very limited	
		Excess salt	1.00	Excess salt	1.00	Excess salt	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.08	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.08	Too gravelly, cobbly, or stony	0.08
Geefour, eroded	35	Very limited		Very limited		Very limited	
		Excess salt	1.00	Excess salt	1.00	Excess salt	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Droughty	0.50	Droughty	0.50	Droughty	0.50
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
						Bedrock	0.02
GFF:							
Geefour	53	Very limited		Very limited		Very limited	
		Excess salt	1.00	Excess salt	1.00	Excess salt	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Droughty	0.50	Droughty	0.50	Droughty	0.50
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
						Bedrock	0.09
Corazones	21	Not limited		Somewhat limited		Somewhat limited	
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
Ojinaga	13	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.82
		Too gravelly, cobbly, or stony	0.19	Extreme soil temperatures	0.50	Droughty	0.50
				Too gravelly, cobbly, or stony	0.19	Extreme soil temperatures	0.50
						Too gravelly, cobbly, or stony	0.19
GMF:							
Geefour	49	Very limited		Very limited		Very limited	
		Excess sodium	1.00	Excess Sodium	1.00	Excess Sodium	1.00
		Excess salt	0.78	Excess salt	0.78	Excess salt	0.78
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Droughty	0.50	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Droughty	0.50	Droughty	0.50
Melado	31	Very limited		Somewhat limited		Somewhat limited	
		Excess sodium	1.00	Excess salt	0.99	Excess salt	0.99
		Excess salt	0.99	Excess Sodium	0.94	Excess Sodium	0.94
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
GSA:							
Gemelo	60	Not limited		Not limited		Not limited	
Straddlebug	25	Very limited		Somewhat limited		Somewhat limited	
		Excess sodium	1.00	Excess Sodium	0.94	Excess Sodium	0.94
				Too alkaline	0.68		
HOB:							
Holguin	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.31	Too gravelly, cobbly, or stony	0.31	Too gravelly, cobbly, or stony	0.31
						Bedrock	0.01
HOD:							
Horsetrap	57	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
						Bedrock	0.13
Bofecillos	28	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.35	Too gravelly, cobbly, or stony	0.35	Too gravelly, cobbly, or stony	0.35
Rock outcrop	10	Not rated		Not rated		Not rated	
KIB:							
Kinco	80	Not limited		Not limited		Not limited	

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
LGC:							
Lingua	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.18	Too gravelly, cobbly, or stony	0.18	Too gravelly, cobbly, or stony	0.18
						Bedrock	0.03
LIF:							
Lingua	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.18	Too gravelly, cobbly, or stony	0.18	Too gravelly, cobbly, or stony	0.18
						Bedrock	0.03
Ohtwo	30	Somewhat limited		Somewhat limited		Very limited	
		Too gravelly, cobbly, or stony	0.07	Too gravelly, cobbly, or stony	0.07	Bedrock	1.00
						Too gravelly, cobbly, or stony	0.07
MAE:							
Manzanillo	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.98
		Too gravelly, cobbly, or stony	0.02	Too gravelly, cobbly, or stony	0.02	Droughty	0.50
						Bedrock	0.36
						Too gravelly, cobbly, or stony	0.02
Paisano	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.90
						Droughty	0.50
MBE:							
Manzanillo	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.87
						Droughty	0.50
						Bedrock	0.24
Chilicotal	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.56	Too gravelly, cobbly, or stony	0.56	Too gravelly, cobbly, or stony	0.56
Holguin	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03
						Bedrock	0.01
MCA:							
Marfa	92	Not limited		Not limited		Not limited	
MDE:							
Mariscal	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.47	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.47	Too gravelly, cobbly, or stony	0.47
						Bedrock	0.01

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
Rock outcrop--------	15	Not rated		Not rated		Not rated	
MOA:							
Martillo----------	60	Very limited		Very limited		Very limited	
		Excess sodium	1.00	Excess Sodium	1.00	Excess Sodium	1.00
		Excess salt	0.01	Excess salt	0.01	Excess salt	0.01
Butcherknife--------	25	Very limited		Very limited		Very limited	
		Excess sodium	1.00	Excess Sodium	1.00	Bedrock	1.00
		Excess salt	0.08	Excess salt	0.08	Excess Sodium	1.00
						Excess salt	0.08
MPB:							
Melado----------	54	Very limited		Somewhat limited		Somewhat limited	
		Excess sodium	1.00	Excess salt	0.99	Excess salt	0.99
		Excess salt	0.99	Excess Sodium	0.94	Excess Sodium	0.94
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
Pantera----------	38	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Droughty	0.50	Droughty	0.50
MUB:							
Murray----------	58	Not limited		Not limited		Not limited	
Marfa----------	21	Not limited		Not limited		Not limited	
Boracho----------	15	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.94
		Too gravelly, cobbly, or stony	0.01	Too gravelly, cobbly, or stony	0.01	Droughty	0.50
						Too gravelly, cobbly, or stony	0.01
MZA:							
Musquiz----------	80	Not limited		Not limited		Not limited	
NLA:							
Nillo----------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
NPB:							
Nolam----------	55	Not limited		Not limited		Not limited	
Paisano----------	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.62	Too gravelly, cobbly, or stony	0.62	Cemented pan	0.87
		Droughty	0.50	Droughty	0.50	Too gravelly, cobbly, or stony	0.62
						Droughty	0.50
PAC:							
Paisano----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.98
						Droughty	0.50

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
PAD:							
Paisano	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.98
						Droughty	0.50
PIB:							
Paisano	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.98
						Droughty	0.50
Musgrave	35	Very limited		Somewhat limited		Somewhat limited	
		Excess sodium	1.00	Excess Sodium	0.25	Bedrock	0.32
						Excess Sodium	0.25
PKD:							
Pantak	46	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.02	Too gravelly, cobbly, or stony	0.02	Bedrock	0.03
						Too gravelly, cobbly, or stony	0.02
Lingua	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.80	Too gravelly, cobbly, or stony	0.80	Too gravelly, cobbly, or stony	0.80
		Droughty	0.50	Droughty	0.50	Droughty	0.50
PKE:							
Pantak	36	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.01	Too gravelly, cobbly, or stony	0.01	Too gravelly, cobbly, or stony	0.01
						Bedrock	0.01
Lingua	24	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.41	Too gravelly, cobbly, or stony	0.41	Too gravelly, cobbly, or stony	0.41
						Bedrock	0.03
Rock outcrop	19	Not rated		Not rated		Not rated	
PTA:							
Phantom	86	Not limited		Not limited		Not limited	
PZB:							
Phantom	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
Musquiz	39	Not limited		Not limited		Not limited	
QBE:							
Quadria	40	Very limited		Very limited		Very limited	
		Excess sodium	1.00	Excess Sodium	1.00	Excess Sodium	1.00
		Excess salt	0.50	Excess salt	0.50	Excess salt	0.50
Nolam	30	Not limited		Not limited		Not limited	

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
Musgrave----------	25	Very limited		Somewhat limited		Somewhat limited	
		Excess sodium	1.00	Excess Sodium	0.25	Bedrock	0.32
						Excess Sodium	0.25
RCE:							
Redford----------	52	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.50	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.50	Too gravelly, cobbly, or stony	0.50
						Bedrock	0.15
Corazones----------	32	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.03	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03
RCG:							
Redford----------	54	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.49	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.49	Too gravelly, cobbly, or stony	0.49
						Bedrock	0.22
Corazones----------	36	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.03	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.03	Too gravelly, cobbly, or stony	0.03
RED:							
Redlight----------	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
						Bedrock	0.21
Terlingua----------	15	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.04	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.04	Bedrock	0.05
						Too gravelly, cobbly, or stony	0.04
Rock outcrop--------	24	Not rated		Not rated		Not rated	
REE:							
Reduff----------	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.18	Too gravelly, cobbly, or stony	0.18	Bedrock	0.19
						Too gravelly, cobbly, or stony	0.18

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
Scotal	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.20	Too gravelly, cobbly, or stony	0.20	Too gravelly, cobbly, or stony	0.20
						Bedrock	0.03
Holguin	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.04	Too gravelly, cobbly, or stony	0.04	Bedrock	0.36
						Too gravelly, cobbly, or stony	0.04
RIA:							
Riverwash	50	Not rated		Not rated		Not rated	
Pantera	36	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too alkaline	0.32		
RMB:							
Rockhouse	60	Not limited		Not limited		Not limited	
Medley	27	Not limited		Not limited		Not limited	
SCB:							
Sanmoss	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.02	Too gravelly, cobbly, or stony	0.02	Too gravelly, cobbly, or stony	0.02
Medley	25	Not limited		Not limited		Not limited	
SDC:							
Sauceda	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.18	Too gravelly, cobbly, or stony	0.18	Too gravelly, cobbly, or stony	0.18
						Bedrock	0.03
Boludo	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.92
		Too gravelly, cobbly, or stony	0.02	Too gravelly, cobbly, or stony	0.02	Droughty	0.50
						Bedrock	0.27
						Too gravelly, cobbly, or stony	0.02
SEE:							
Sauceda	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.18	Too gravelly, cobbly, or stony	0.18	Too gravelly, cobbly, or stony	0.18
						Bedrock	0.03
Decoty	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.04	Too gravelly, cobbly, or stony	0.04	Bedrock	0.17
						Too gravelly, cobbly, or stony	0.04

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
SHC:							
Scotal----------	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.20	Too gravelly, cobbly, or stony	0.20	Too gravelly, cobbly, or stony	0.20
						Bedrock	0.03
Holguin----------	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.04	Too gravelly, cobbly, or stony	0.04	Bedrock	0.36
						Too gravelly, cobbly, or stony	0.04
SHE:							
Scotal----------	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.19	Too gravelly, cobbly, or stony	0.19	Too gravelly, cobbly, or stony	0.19
						Bedrock	0.02
Rock outcrop--------	15	Not rated		Not rated		Not rated	
SIG:							
Scotal----------	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.22	Too gravelly, cobbly, or stony	0.22	Too gravelly, cobbly, or stony	0.22
						Bedrock	0.03
Ohtwo----------	30	Somewhat limited		Somewhat limited		Very limited	
		Too gravelly, cobbly, or stony	0.07	Too gravelly, cobbly, or stony	0.07	Bedrock	1.00
						Too gravelly, cobbly, or stony	0.07
Rock outcrop--------	20	Not rated		Not rated		Not rated	
SRA:							
Straddlebug---------	80	Very limited		Somewhat limited		Somewhat limited	
		Excess sodium	1.00	Excess Sodium	0.94	Excess Sodium	0.94
				Too alkaline	0.68		
STE:							
Strawhouse----------	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.98
		Too gravelly, cobbly, or stony	0.06	Extreme soil temperatures	0.50	Droughty	0.50
				Too gravelly, cobbly, or stony	0.06	Extreme soil temperatures	0.50
						Too gravelly, cobbly, or stony	0.06
Stillwell----------	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.02	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.02	Too gravelly, cobbly, or stony	0.02

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants: Rating class and limiting features	Value	Upland Desertic Shrubs and Trees: Rating class and limiting features	Value	Upland Shrubs and Vines: Rating class and limiting features	Value
SUD:							
Studybutte----------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.26	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.26	Too gravelly, cobbly, or stony	0.26
						Bedrock	0.06
SUE:							
Studybutte----------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.14	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.14	Too gravelly, cobbly, or stony	0.14
						Bedrock	0.01
Rock outcrop--------	25	Not rated		Not rated		Not rated	
SUG:							
Studybutte----------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.14	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.14	Too gravelly, cobbly, or stony	0.14
						Bedrock	0.01
Rock outcrop--------	30	Not rated		Not rated		Not rated	
TEA:							
Tenneco----------	70	Not limited		Not limited		Not limited	
Bodecker----------	15	Not limited		Not limited		Not limited	
TRE:							
Terlingua----------	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.12	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.12	Too gravelly, cobbly, or stony	0.12
						Bedrock	0.04
Rock outcrop--------	25	Not rated		Not rated		Not rated	
TRG:							
Terlingua----------	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.16	Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
				Too gravelly, cobbly, or stony	0.16	Too gravelly, cobbly, or stony	0.16
						Bedrock	0.12
Rock outcrop--------	30	Not rated		Not rated		Not rated	

Table 19.--Upland Native Herbaceous Plants, Desertic Shrubs and Trees, and Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland Native Herbaceous Plants		Upland Desertic Shrubs and Trees		Upland Shrubs and Vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VAA:							
Verhalen	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Excess salt	0.01	Excess salt	0.01	Excess salt	0.01
VCA:							
Vicente	30	Not limited		Somewhat limited		Somewhat limited	
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
Lomapelona	29	Not limited		Somewhat limited		Somewhat limited	
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
Castolon	25	Not limited		Somewhat limited		Somewhat limited	
				Extreme soil temperatures	0.50	Extreme soil temperatures	0.50
VOC:							
Volco	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Droughty	0.50
		Too gravelly, cobbly, or stony	0.02	Too gravelly, cobbly, or stony	0.02	Bedrock	0.32
						Too gravelly, cobbly, or stony	0.02
Pardo	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Droughty	0.50	Cemented pan	0.81
						Droughty	0.50
						Bedrock	0.32
W:							
Water	100	Not rated		Not rated		Not rated	

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees

(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	
		Rating class and limiting features	Value	Rating class and limiting features	Value
ALB:					
Altar	45	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.99
Bodecker	30	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too sandy	0.50		
		Too gravelly, cobbly, or stony	0.44		
Riverwash	15	Not rated		Not rated	
ANS:					
Area not surveyed	100	Not rated		Not rated	
BAC:					
Baviza	75	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00
		Too sandy	0.50		
Pantera	21	Very limited		Very limited	
		Too sandy	1.00	Droughty	1.00
		Too dry	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.07		
BEB:					
Berrend	72	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Espy	17	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
BIC:					
Bissett	65	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.13		
Rock outcrop	20	Not rated		Not rated	

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--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
BIE:					
Bissett	60	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.13		
Rock outcrop	25	Not rated		Not rated	
BIG:					
Bissett	70	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.13		
Rock outcrop	25	Not rated		Not rated	
BLE:					
Blackgap	52	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.82		
Rock outcrop	45	Not rated		Not rated	
BLG:					
Blackgap	75	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.82		
Rock outcrop	20	Not rated		Not rated	
BNE:					
Bofecillos	47	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	1.00		
Horsetrap	21	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	1.00		
Rock outcrop	17	Not rated		Not rated	

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants		Riparian Shrubs, Vines, and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BNG:					
Bofecillos	45	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.32		
Rock outcrop	40	Not rated		Not rated	
BOB:					
Boracho	60	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.63		
Espy	20	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.98
BOC:					
Borunda	60	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Borunda, gravelly	20	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
BRD:					
Brewster	75	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.87		
BRF:					
Brewster	65	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.69		
Rock outcrop	15	Not rated		Not rated	
BRG:					
Brewster	60	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.98		

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants		Riparian Shrubs, Vines, and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Rock outcrop--------	25	Not rated		Not rated	
BUD:					
Buckear----------	55	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.08		
Coyanosa----------	35	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.99		
CAA:					
Castolon----------	79	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
CAG:					
Catto----------	50	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.89		
Buckear----------	35	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.08		
Rock outcrop--------	10	Not rated		Not rated	
CIC:					
Chilicotal----------	80	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.01
		Too gravelly, cobbly, or stony	0.13		
CID:					
Chilicotal----------	80	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.01
		Too gravelly, cobbly, or stony	0.13		

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--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
CLC:					
Chilicotal----------	61	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.05
Paisano----------	32	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.57		
CMC:					
Chilimol----------	45	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
		Too gravelly, cobbly, or stony	0.32		
Boracho----------	32	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	1.00		
Berrend----------	13	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
CND:					
Chinati----------	54	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.05		
Boracho----------	19	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Berrend----------	12	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
CNE:					
Chinati----------	50	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.05		

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--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
Boracho	30	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.05		
COC:					
Corazones	50	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.97
Ojinaga	40	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.71		
COE:					
Corazones	61	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.65
		Too gravelly, cobbly, or stony	0.13		
Ojinaga	26	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00
		Too gravelly, cobbly, or stony	0.17		
CVC:					
Costavar	53	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Volco	19	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.24		
EEB:					
Espy	56	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00
Eppenauer	39	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.11

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--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
GAA:					
Galindo	76	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Excess salt	0.01
		Excess salt	0.01		
GEF:					
Geefour	45	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Excess salt	1.00	Excess salt	1.00
		Too gravelly, cobbly, or stony	0.32		
Geefour, eroded	35	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Excess salt	1.00	Excess salt	1.00
GFF:					
Geefour	53	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Excess salt	1.00	Excess salt	1.00
Corazones	21	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.52
Ojinaga	13	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.71		
GMF:					
Geefour	49	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Excess salt	1.00
		Excess salt	1.00	Droughty	1.00
		Excess sodium	0.20	Excess sodium	0.43
Melado	31	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Excess salt	1.00
		Excess salt	1.00	Droughty	0.35

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants		Riparian Shrubs, Vines, and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GSA:					
Gemelo	60	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.01
Straddlebug	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
HOB:					
Holguin	85	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.91		
HOD:					
Horsetrap	57	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Bofecillos	28	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.95		
Rock outcrop	10	Not rated		Not rated	
KIB:					
Kinco	80	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
LGC:					
Lingua	70	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.68		
LIF:					
Lingua	55	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.68		

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants		Riparian Shrubs, Vines, and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ohtwo	30	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.01
		Too gravelly, cobbly, or stony	0.29		
MAE:					
Manzanillo	65	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.07		
Paisano	30	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
MBE:					
Manzanillo	40	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Chilicotal	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.92
		Too gravelly, cobbly, or stony	1.00		
Holguin	20	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.12		
MCA:					
Marfa	92	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
MDE:					
Mariscal	80	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.99		
Rock outcrop	15	Not rated		Not rated	

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants		Riparian Shrubs, Vines, and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MOA:					
Martillo	60	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Butcherknife	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
MPB:					
Melado	54	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Excess salt	1.00
		Excess salt	1.00	Droughty	0.82
Pantera	38	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00
MUB:					
Murray	58	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Marfa	21	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Boracho	15	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.01		
MZA:					
Musquiz	80	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
NLA:					
Nillo	90	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
NPB:					
Nolam	55	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.33

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--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
Paisano----------	25	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	1.00		
PAC:					
Paisano----------	80	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
PAD:					
Paisano----------	80	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
PIB:					
Paisano----------	55	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Musgrave----------	35	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.30
		Excess sodium	0.05	Excess sodium	0.11
PKD:					
Pantak----------	46	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.08		
Lingua----------	35	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	1.00		
PKE:					
Pantak----------	36	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.03		
Lingua----------	24	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.98		

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--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
Rock outcrop--------	19	Not rated		Not rated	
PTA:					
Phantom----------	86	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
PZB:					
Phantom----------	45	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Musquiz----------	39	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
QBE:					
Quadria----------	40	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Nolam----------	30	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.65
Musgrave----------	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.30
		Excess sodium	0.05	Excess sodium	0.11
RCE:					
Redford----------	52	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	1.00		
Corazones----------	32	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.65
		Too gravelly, cobbly, or stony	0.13		
RCG:					
Redford----------	54	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	1.00		

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--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
Corazones	36	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.63
		Too gravelly, cobbly, or stony	0.13		
RED:					
Redlight	45	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Terlingua	15	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.15		
Rock outcrop	24	Not rated		Not rated	
REE:					
Reduff	30	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.68		
Scotal	30	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.73		
Holguin	25	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.16		
RIA:					
Riverwash	50	Not rated		Not rated	
Pantera	36	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
				Too dry	1.00
RMB:					
Rockhouse	60	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--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
Medley	27	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
SCB:					
Sanmoss	65	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
		Too gravelly, cobbly, or stony	0.08		
Medley	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
SDC:					
Sauceda	60	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.68		
Boludo	20	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.07		
SEE:					
Sauceda	55	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.68		
Decoty	40	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.15		
SHC:					
Scotal	50	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.73		

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants		Riparian Shrubs, Vines, and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Holguin	35	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.16		
SHE:					
Scotal	65	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.70		
Rock outcrop	15	Not rated		Not rated	
SIG:					
Scotal	40	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.78		
Ohtwo	30	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
		Too gravelly, cobbly, or stony	0.29		
Rock outcrop	20	Not rated		Not rated	
SRA:					
Straddlebug	80	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
STE:					
Strawhouse	50	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.22		
Stillwell	35	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.97
		Too gravelly, cobbly, or stony	0.06		

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants		Riparian Shrubs, Vines, and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SUD:					
Studybutte	85	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.85		
SUE:					
Studybutte	60	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.57		
Rock outcrop	25	Not rated		Not rated	
SUG:					
Studybutte	60	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.57		
Rock outcrop	30	Not rated		Not rated	
TEA:					
Tenneco	70	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Bodecker	15	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.14
TRE:					
Terlingua	70	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.47		
Rock outcrop	25	Not rated		Not rated	
TRG:					
Terlingua	65	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.63		
Rock outcrop	30	Not rated		Not rated	

Table 20.--Riparian Herbaceous Plants, and Riparian Shrubs, Vines, and Trees--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants		Riparian Shrubs, Vines, and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
VAA:					
Verhalen	80	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
VCA:					
Vicente	30	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Flooding	0.50
		Long flooding	0.50		
Lomapelona	29	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Flooding	0.50
		Long flooding	0.50		
Castolon	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Flooding	0.50
		Long flooding	0.50		
VOC:					
Volco	45	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.08		
Pardo	45	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00
W:					
Water	100	Not rated		Not rated	

Table 21.--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
ALB:							
Altar	45	Very limited Flooding	 1.00	Very limited Flooding	 1.00	Very limited Flooding	 1.00
Bodecker	30	Very limited Flooding Large stones	 1.00 0.23	Very limited Flooding Large stones	 1.00 0.23	Very limited Flooding Large stones	 1.00 0.23
Riverwash	15	Not rated		Not rated		Not rated	
ANS:							
Area not surveyed	100	Not rated		Not rated		Not rated	
BAC:							
Baviza	75	Somewhat limited Subsidence risk	 0.01	Somewhat limited Subsidence risk	 0.01	Somewhat limited Subsidence risk	 0.01
Pantera	21	Very limited Flooding	 1.00	Very limited Flooding	 1.00	Very limited Flooding	 1.00
BEB:							
Berrend	72	Somewhat limited Shrink-swell	 0.43	Somewhat limited Shrink-swell	 0.04	Somewhat limited Shrink-swell	 0.43
Espy	17	Not limited		Not limited		Not limited	
BIC:							
Bissett	65	Very limited Depth to hard bedrock	 1.00	Very limited Depth to hard bedrock	 1.00	Very limited Depth to hard bedrock	 1.00
Rock outcrop	20	Not rated		Not rated		Not rated	
BIE:							
Bissett	60	Very limited Depth to hard bedrock Slope	 1.00 1.00	Very limited Depth to hard bedrock Slope	 1.00 1.00	Very limited Depth to hard bedrock Slope	 1.00 1.00
Rock outcrop	25	Not rated		Not rated		Not rated	
BIG:							
Bissett	70	Very limited Slope Depth to hard bedrock	 1.00 1.00	Very limited Slope Depth to hard bedrock	 1.00 1.00	Very limited Slope Depth to hard bedrock	 1.00 1.00
Rock outcrop	25	Not rated		Not rated		Not rated	

Table 21.--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
BLE:							
Blackgap----------	52	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
		Large stones	0.37	Large stones	0.37	Large stones	0.37
Rock outcrop--------	45	Not rated		Not rated		Not rated	
BLG:							
Blackgap----------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.37	Large stones	0.37	Large stones	0.37
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BNE:							
Bofecillos----------	47	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Horsetrap----------	21	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Rock outcrop--------	17	Not rated		Not rated		Not rated	
BNG:							
Bofecillos----------	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Rock outcrop--------	40	Not rated		Not rated		Not rated	
BOB:							
Boracho----------	60	Not limited		Not limited		Not limited	
Espy----------	20	Not limited		Not limited		Not limited	
BOC:							
Borunda----------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Depth to hard bedrock	0.99	Shrink-swell	0.50
				Depth to soft bedrock	0.64		
				Shrink-swell	0.50		

Table 21.--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
Borunda, gravelly---	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Depth to hard bedrock	0.99	Shrink-swell	0.50
				Shrink-swell	0.50		
				Depth to soft bedrock	0.46		
BRD:							
Brewster----------	75	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
						Slope	1.00
BRF:							
Brewster----------	65	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Rock outcrop--------	15	Not rated		Not rated		Not rated	
BRG:							
Brewster----------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.99	Large stones	0.99	Large stones	0.99
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BUD:							
Buckear----------	55	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
						Slope	1.00
Coyanosa----------	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
CAA:							
Castolon----------	79	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
CAG:							
Catto----------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Buckear----------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00

Table 21.--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
Rock outcrop--------	10	Not rated		Not rated		Not rated	
CIC:							
Chilicotal----------	80	Not limited		Not limited		Not limited	
CID:							
Chilicotal----------	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
CLC:							
Chilicotal----------	61	Not limited		Not limited		Not limited	
Paisano----------	32	Not limited		Not limited		Not limited	
CMC:							
Chilimol----------	45	Not limited		Not limited		Somewhat limited	
						Slope	0.13
Boracho----------	32	Not limited		Not limited		Somewhat limited	
						Slope	0.13
Berrend----------	13	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.20	Shrink-swell	0.50
						Slope	0.13
CND:							
Chinati----------	54	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.99	Depth to hard bedrock	1.00	Depth to hard bedrock	0.99
						Slope	0.50
Boracho----------	19	Somewhat limited		Somewhat limited		Very limited	
		Large stones	0.01	Large stones	0.01	Slope	1.00
						Large stones	0.01
Berrend----------	12	Not limited		Not limited		Somewhat limited	
						Slope	0.13
CNE:							
Chinati----------	50	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.16	Slope	0.16	Depth to hard bedrock	0.54
Boracho----------	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
COC:							
Corazones----------	50	Not limited		Not limited		Somewhat limited	
						Slope	0.13
Ojinaga----------	40	Not limited		Not limited		Somewhat limited	
						Slope	0.13
COE:							
Corazones----------	61	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Table 21.--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
Ojinaga	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
CVC:							
Costavar	53	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Volco	19	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.99	Large stones	0.99	Large stones	0.99
EEB:							
Espy	56	Not limited		Not limited		Not limited	
Eppenauer	39	Not limited		Somewhat limited		Not limited	
				Depth to soft bedrock	0.95		
GAA:							
Galindo	76	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
GEF:							
Geefour	45	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Slope	1.00
		Slope	1.00	Depth to soft bedrock	1.00	Shrink-swell	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Depth to soft bedrock	1.00
Geefour, eroded	35	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Slope	1.00
		Slope	1.00	Depth to soft bedrock	1.00	Shrink-swell	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Depth to soft bedrock	1.00
GFF:							
Geefour	53	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Slope	1.00
Corazones	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.22	Large stones	0.22	Large stones	0.22
Ojinaga	13	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00

Table 21.--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
GMF:							
Geefour	49	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Slope	1.00
		Subsidence risk	0.03	Subsidence risk	0.03	Subsidence risk	0.03
Melado	31	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	1.00
GSA:							
Gemelo	60	Not limited		Not limited		Not limited	
Straddlebug	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.54	Shrink-swell	0.04	Shrink-swell	0.54
HOB:							
Holguin	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
						Slope	0.13
HOD:							
Horsetrap	57	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
						Slope	1.00
Bofecillos	28	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
						Slope	1.00
Rock outcrop	10	Not rated		Not rated		Not rated	
KIB:							
Kinco	80	Not limited		Not limited		Not limited	
LGC:							
Lingua	70	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
LIF:							
Lingua	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Ohtwo	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.40	Shrink-swell	0.23	Shrink-swell	0.40

Table 21.--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
MAE:							
Manzanillo----------	65	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Paisano----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
MBE:							
Manzanillo----------	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Chilicotal----------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Holguin----------	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
MCA:							
Marfa----------	92	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.12	Shrink-swell	0.50
		Subsidence risk	0.03	Subsidence risk	0.03	Subsidence risk	0.03
MDE:							
Mariscal----------	80	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
		Large stones	0.68	Large stones	0.68	Large stones	0.68
Rock outcrop--------	15	Not rated		Not rated		Not rated	
MOA:							
Martillo----------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.99	Shrink-swell	0.89	Shrink-swell	0.99
Butcherknife--------	25	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Subsidence risk	0.11	Subsidence risk	0.11	Subsidence risk	0.11
MPB:							
Melado----------	54	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Pantera----------	38	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Subsidence risk	0.05	Subsidence risk	0.05	Subsidence risk	0.05

Table 21.--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
MUB:							
Murray----------	58	Not limited		Not limited		Not limited	
Marfa----------	21	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.12	Shrink-swell	0.50
		Subsidence risk	0.03	Subsidence risk	0.03	Subsidence risk	0.03
Boracho----------	15	Not limited		Not limited		Not limited	
MZA:							
Musquiz----------	80	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.99	Shrink-swell	1.00
NLA:							
Nillo----------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NPB:							
Nolam----------	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.22	Shrink-swell	0.02	Shrink-swell	0.22
Paisano----------	25	Not limited		Not limited		Not limited	
PAC:							
Paisano----------	80	Not limited		Not limited		Not limited	
PAD:							
Paisano----------	80	Not limited		Not limited		Very limited	
						Slope	1.00
PIB:							
Paisano----------	55	Not limited		Not limited		Not limited	
Musgrave----------	35	Somewhat limited		Very limited		Somewhat limited	
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PKD:							
Pantak----------	46	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
						Slope	0.88
Lingua----------	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
PKE:							
Pantak----------	36	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00

Table 21.--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
Lingua	24	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
		Large stones	0.80	Large stones	0.80	Large stones	0.80
Rock outcrop	19	Not rated		Not rated		Not rated	
PTA:							
Phantom	86	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
PZB:							
Phantom	45	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Musquiz	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.96	Shrink-swell	0.84	Shrink-swell	0.96
QBE:							
Quadria	40	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Nolam	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.57	Shrink-swell	0.54	Shrink-swell	0.57
Musgrave	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
RCE:							
Redford	52	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Corazones	32	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
RCG:							
Redford	54	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Corazones	36	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
RED:							
Redlight	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00

Table 21.--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
Terlingua	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Rock outcrop	24	Not rated		Not rated		Not rated	
REE:							
Reduff	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Scotal	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Holguin	25	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
RIA:							
Riverwash	50	Not rated		Not rated		Not rated	
Pantera	36	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
RMB:							
Rockhouse	60	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Medley	27	Not limited		Not limited		Not limited	
SCB:							
Sanmoss	65	Not limited		Not limited		Not limited	
Medley	25	Not limited		Not limited		Not limited	
SDC:							
Sauceda	60	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.04	Large stones	0.04	Large stones	0.04
Boludo	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Shrink-swell	0.06	Shrink-swell	0.06	Shrink-swell	0.06
		Large stones	0.01	Large stones	0.01	Large stones	0.01
SEE:							
Sauceda	55	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
		Large stones	0.04	Large stones	0.04	Large stones	0.04

Table 21.--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
Decoty	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
SHC:							
Scotal	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
						Slope	0.13
Holguin	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
SHE:							
Scotal	65	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
Rock outcrop	15	Not rated		Not rated		Not rated	
SIG:							
Scotal	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Ohtwo	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.25			Shrink-swell	0.25
Rock outcrop	20	Not rated		Not rated		Not rated	
SRA:							
Straddlebug	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.54	Shrink-swell	0.04	Shrink-swell	0.54
STE:							
Strawhouse	50	Not limited		Not limited		Somewhat limited	
						Slope	0.13
Stillwell	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
SUD:							
Studybutte	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
SUE:							
Studybutte	60	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00

Table 21.--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
Rock outcrop--------	25	Not rated		Not rated		Not rated	
SUG:							
Studybutte----------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
TEA:							
Tenneco----------	70	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Bodecker----------	15	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
TRE:							
Terlingua----------	70	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
TRG:							
Terlingua----------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
VAA:							
Verhalen----------	80	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
		Subsidence risk	0.01	Subsidence risk	0.01	Subsidence risk	0.01
VCA:							
Vicente----------	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Lomapelona----------	29	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Castolon----------	25	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
VOC:							
Volco----------	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00

Table 21.--Dwellings and Small Commercial Buildings--Continued

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
Pardo	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
W:							
Water	100	Not rated		Not rated		Not rated	

Table 22.--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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ALB:							
Altar	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Flooding	0.40	Unstable excavation walls	0.37	Droughty	0.99
				Dusty	0.06	Dusty	0.06
						Gravel content	0.05
Bodecker	30	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Unstable excavation walls	0.80	Droughty	1.00
		Large stones	0.23	Flooding	0.60	Gravel content	0.99
				Large stones	0.23	Flooding	0.60
						Large stones content	0.20
Riverwash	15	Not rated		Not rated		Not rated	
ANS:							
Area not surveyed	100	Not rated		Not rated		Not rated	
BAC:							
Baviza	75	Not limited		Somewhat limited		Very limited	
				Unstable excavation walls	0.50	Droughty	1.00
Pantera	21	Very limited		Very limited		Very limited	
		Flooding	1.00	Unstable excavation walls	1.00	Flooding	1.00
				Flooding	0.80	Too sandy	1.00
						Droughty	1.00
						Gravel content	0.78
						Large stones content	0.20
BEB:							
Berrend	72	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Dusty	0.16	Dusty	0.16
		Shrink-swell	0.43	Unstable excavation walls	0.01		
Espy	17	Not limited		Somewhat limited		Very limited	
				Unstable excavation walls	0.01	Depth to cemented pan	1.00
						Droughty	1.00
						Carbonate content	1.00
BIC:							
Bissett	65	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
				Dusty	0.32	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.32

Table 22.--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
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BIE:							
Bissett----------	60	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Dusty	0.32	Gravel content	1.00
				Unstable excavation walls	0.01	Slope	1.00
						Carbonate content	1.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	70	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.32	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Carbonate content	1.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BLE:							
Blackgap----------	52	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Too dense	1.00
		Large stones	0.37	Dusty	0.41	Depth to bedrock	1.00
				Large stones	0.37	Gravel content	1.00
				Unstable excavation walls	0.01	Slope	1.00
Rock outcrop--------	45	Not rated		Not rated		Not rated	
BLG:							
Blackgap----------	75	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
		Large stones	0.37	Dusty	0.41	Too dense	1.00
				Large stones	0.37	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BNE:							
Bofecillos----------	47	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.10	Gravel content	1.00
				Unstable excavation walls	0.01	Slope	1.00
						Dusty	0.10

Table 22.-- 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
Horsetrap----------	21	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Unstable excavation walls	0.51	Slope	1.00
				Dusty	0.10	Gravel content	1.00
						Large stones content	0.79
Rock outcrop--------	17	Not rated		Not rated		Not rated	
BNG:							
Bofecillos----------	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.31	Slope	1.00
				Unstable excavation walls	0.01	Gravel content	0.97
						Dusty	0.31
Rock outcrop--------	40	Not rated		Not rated		Not rated	
BOB:							
Boracho----------	60	Not limited		Somewhat limited		Very limited	
				Unstable excavation walls	0.89	Depth to cemented pan	1.00
				Dusty	0.12	Droughty	1.00
						Gravel content	1.00
						Dusty	0.12
						Large stones content	0.01
Espy----------	20	Not limited		Somewhat limited		Very limited	
				Dusty	0.32	Depth to cemented pan	1.00
				Unstable excavation walls	0.01	Carbonate content	1.00
						Droughty	0.98
						Gravel content	0.92
						Dusty	0.32
BOC:							
Borunda----------	60	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Depth to hard bedrock	0.99	Sodium content	1.00
		Shrink-swell	0.50	Depth to soft bedrock	0.64	Depth to bedrock	0.65
				Dusty	0.50	Dusty	0.50
				Too clayey	0.47	Droughty	0.01
				Unstable excavation walls	0.01		

Table 22.--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
Borunda, gravelly---	20	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Depth to hard bedrock	0.99	Sodium content	1.00
		Shrink-swell	0.50	Depth to soft bedrock	0.46	Depth to bedrock	0.46
				Dusty	0.43	Dusty	0.43
				Unstable excavation walls	0.01	Gravel content	0.08
BRD:							
Brewster----------	75	Very limited		Not rated		Very limited	
		Depth to hard bedrock	1.00			Depth to bedrock	1.00
						Droughty	1.00
						Gravel content	1.00
						Dusty	0.38
BRF:							
Brewster----------	65	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.32	Slope	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Dusty	0.32
Rock outcrop--------	15	Not rated		Not rated		Not rated	
BRG:							
Brewster----------	60	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.99	Large stones	0.99	Droughty	1.00
				Dusty	0.38	Large stones content	1.00
				Unstable excavation walls	0.01	Dusty	0.38
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BUD:							
Buckear----------	55	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Droughty	1.00
				Dusty	0.27	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	0.99
						Dusty	0.27
						Large stones content	0.01
Coyanosa----------	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	0.37	Slope	0.37	Droughty	1.00
				Dusty	0.01	Gravel content	1.00
				Unstable excavation walls	0.01	Slope	0.37
						Dusty	0.01

Table 22.--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
CAA:							
Castolon----------	79	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Dusty	0.50	Dusty	0.50
		Shrink-swell	0.50	Unstable excavation walls	0.01		
CAG:							
Catto----------	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
				Dusty	0.27	Droughty	1.00
				Unstable excavation walls	0.01	Depth to bedrock	1.00
						Dusty	0.27
Buckear----------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.27	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	0.99
						Dusty	0.27
Rock outcrop--------	10	Not rated		Not rated		Not rated	
CIC:							
Chilicotal----------	80	Not limited		Somewhat limited		Very limited	
				Dusty	0.27	Gravel content	1.00
				Unstable excavation walls	0.01	Dusty	0.27
						Droughty	0.01
CID:							
Chilicotal----------	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Gravel content	1.00
				Dusty	0.27	Slope	0.37
				Unstable excavation walls	0.01	Dusty	0.27
						Droughty	0.01
CLC:							
Chilicotal----------	61	Not limited		Somewhat limited		Somewhat limited	
				Dusty	0.18	Dusty	0.18
				Unstable excavation walls	0.01	Gravel content	0.07
						Droughty	0.06
						Large stones content	0.01
Paisano----------	32	Not limited		Somewhat limited		Very limited	
				Dusty	0.19	Depth to cemented pan	1.00
				Unstable excavation walls	0.01	Droughty	1.00
						Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.19

Table 22.--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
CMC:							
Chilimol----------	45	Not limited		Somewhat limited		Very limited	
				Dusty	0.34	Gravel content	1.00
				Unstable excavation walls	0.01	Dusty	0.34
Boracho----------	32	Not limited		Somewhat limited		Very limited	
				Unstable excavation walls	0.51	Depth to cemented pan	1.00
				Dusty	0.04	Droughty	1.00
						Gravel content	1.00
						Large stones content	0.46
						Dusty	0.04
Berrend----------	13	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Dusty	0.27	Dusty	0.27
		Shrink-swell	0.50	Unstable excavation walls	0.01		
CND:							
Chinati----------	54	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.99	Depth to hard bedrock	1.00	Depth to cemented pan	1.00
				Dusty	0.30	Droughty	1.00
				Unstable excavation walls	0.01	Depth to bedrock	0.99
						Gravel content	0.99
						Dusty	0.30
Boracho----------	19	Somewhat limited		Somewhat limited		Very limited	
		Large stones	0.01	Dusty	0.36	Depth to cemented pan	1.00
				Unstable excavation walls	0.29	Droughty	1.00
				Large stones	0.01	Gravel content	1.00
						Dusty	0.36
Berrend----------	12	Not limited		Somewhat limited		Somewhat limited	
				Dusty	0.16	Dusty	0.16
				Unstable excavation walls	0.01		
CNE:							
Chinati----------	50	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.54	Depth to hard bedrock	1.00	Depth to cemented pan	1.00
		Slope	0.16	Slope	0.16	Droughty	1.00
				Dusty	0.07	Gravel content	1.00
				Unstable excavation walls	0.01	Depth to bedrock	0.54
						Slope	0.16
Boracho----------	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Depth to cemented pan	1.00
				Unstable excavation walls	0.51	Droughty	1.00
				Dusty	0.28	Gravel content	1.00
						Slope	0.63
						Dusty	0.28

Table 22.--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
COC:							
Corazones----------	50	Not limited		Somewhat limited		Somewhat limited	
				Dusty	0.02	Droughty	0.97
				Unstable	0.01	Gravel content	0.93
				excavation walls		Dusty	0.02
Ojinaga----------	40	Not limited		Somewhat limited		Very limited	
				Unstable	0.36	Depth to cemented	1.00
				excavation walls		pan	
				Dusty	0.04	Droughty	1.00
						Gravel content	1.00
						Sodium content	1.00
						Large stones	0.05
						content	
COE:							
Corazones----------	61	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Dusty	0.02	Gravel content	1.00
				Unstable	0.01	Droughty	0.67
				excavation walls		Dusty	0.02
Ojinaga----------	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to cemented	1.00
						pan	
				Dusty	0.28	Droughty	1.00
				Unstable	0.01	Slope	1.00
				excavation walls		Gravel content	1.00
						Dusty	0.28
CVC:							
Costavar----------	53	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Depth to bedrock	1.00
		bedrock		bedrock			
				Dusty	0.13	Droughty	1.00
				Unstable	0.01	Gravel content	0.22
				excavation walls			
						Dusty	0.13
Volco----------	19	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Droughty	1.00
		bedrock		bedrock			
		Large stones	0.99	Large stones	0.99	Depth to bedrock	1.00
				Dusty	0.31	Gravel content	0.99
				Unstable	0.01	Dusty	0.31
				excavation walls		Large stones	0.08
						content	
EEB:							
Espy----------	56	Not limited		Somewhat limited		Very limited	
				Unstable	0.01	Depth to cemented	1.00
				excavation walls		pan	
						Droughty	1.00

Table 22.--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
Eppenauer----------	39	Not limited		Very limited		Somewhat limited	
				Organic matter content	1.00	Depth to bedrock	0.95
				Depth to soft bedrock	0.95	Droughty	0.12
				Dusty	0.09	Dusty	0.09
				Unstable excavation walls	0.01		
GAA:							
Galindo----------	76	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Flooding	0.60	Too clayey	1.00
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Low strength	1.00	Too clayey	0.41	Dusty	0.50
				Unstable excavation walls	0.01		
GEF:							
Geefour----------	45	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to soft bedrock	1.00	Droughty	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Low strength	1.00	Unstable excavation walls	0.51	Gravel content	1.00
		Slope	1.00	Dense layer	0.50	Slope	1.00
				Dusty	0.49	Too clayey	1.00
Geefour, eroded-----	35	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to soft bedrock	1.00	Droughty	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Low strength	1.00	Unstable excavation walls	0.51	Slope	1.00
		Slope	1.00	Dense layer	0.50	Too clayey	1.00
				Dusty	0.50	Salinity	1.00
GFF:							
Geefour----------	53	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to soft bedrock	1.00	Droughty	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Low strength	1.00	Unstable excavation walls	0.51	Slope	1.00
		Slope	1.00	Dense layer	0.50	Too clayey	1.00
				Dusty	0.44	Salinity	1.00
Corazones----------	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.22	Large stones	0.22	Gravel content	0.99
				Dusty	0.02	Droughty	0.53
				Unstable excavation walls	0.02	Dusty	0.02

Table 22.--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
Ojinaga	13	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Depth to cemented pan	1.00
				Unstable excavation walls	0.11	Droughty	1.00
				Dusty	0.03	Gravel content	1.00
						Sodium content	1.00
						Slope	0.16
GMF:							
Geefour	49	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to soft bedrock	1.00	Salinity	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Sodium content	1.00
		Low strength	1.00	Unstable excavation walls	0.51	Depth to bedrock	1.00
		Slope	1.00	Too clayey	0.50	Droughty	1.00
				Dense layer	0.50	Slope	1.00
Melado	31	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Unstable excavation walls	0.51	Sodium content	1.00
		Low strength	1.00	Dusty	0.50	Too clayey	1.00
				Too clayey	0.32	Salinity	1.00
						Dusty	0.50
						Droughty	0.36
GSA:							
Gemelo	60	Not limited		Somewhat limited		Very limited	
				Dusty	0.08	Sodium content	1.00
				Unstable excavation walls	0.01	Dusty	0.08
						Droughty	0.01
Straddlebug	25	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Dusty	0.41	Sodium content	1.00
		Shrink-swell	0.54	Unstable excavation walls	0.01	Dusty	0.41
HOB:							
Holguin	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
				Unstable excavation walls	0.01	Depth to bedrock	1.00
						Gravel content	1.00
HOD:							
Horsetrap	57	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
				Dusty	0.14	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	0.61
						Dusty	0.14
Bofecillos	28	Very limited		Not rated		Very limited	
		Depth to hard bedrock	1.00			Depth to bedrock	1.00
						Droughty	1.00
						Gravel content	1.00
						Dusty	0.06

Table 22.--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
Rock outcrop--------	10	Not rated		Not rated		Not rated	
KIB:							
Kinco----------	80	Not limited		Somewhat limited		Somewhat limited	
				Dusty	0.04	Gravel content	0.12
				Unstable excavation walls	0.01	Dusty	0.04
LGC:							
Lingua----------	70	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Gravel content	1.00
				Dusty	0.22	Droughty	1.00
				Unstable excavation walls	0.01	Depth to bedrock	1.00
						Dusty	0.22
LIF:							
Lingua----------	55	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
				Dusty	0.22	Droughty	1.00
				Unstable excavation walls	0.01	Depth to bedrock	1.00
						Dusty	0.22
Ohtwo----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.40	Dusty	0.36	Gravel content	1.00
				Unstable excavation walls	0.01	Dusty	0.36
						Droughty	0.01
						Large stones content	0.01
MAE:							
Manzanillo----------	65	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.02	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Slope	1.00
						Gravel content	0.78
Paisano----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to cemented pan	1.00
				Dusty	0.26	Droughty	1.00
				Unstable excavation walls	0.01	Slope	1.00
						Carbonate content	1.00
						Gravel content	0.97
MBE:							
Manzanillo----------	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Unstable excavation walls	0.14	Depth to bedrock	1.00
				Dusty	0.09	Slope	1.00
						Gravel content	0.42

Table 22.--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
Chilicotal----------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Unstable excavation walls	0.51	Large stones content	0.99
				Dusty	0.11	Gravel content	0.98
						Droughty	0.92
						Dusty	0.11
Holguin----------	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Dusty	0.01	Gravel content	1.00
				Unstable excavation walls	0.01	Slope	1.00
						Dusty	0.01
MCA:							
Marfa----------	92	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Dusty	0.40	Dusty	0.40
		Shrink-swell	0.50	Unstable excavation walls	0.01		
MDE:							
Mariscal----------	80	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Large stones	0.68	Large stones	0.68	Large stones content	1.00
				Dusty	0.27	Slope	1.00
				Unstable excavation walls	0.01	Carbonate content	1.00
Rock outcrop--------	15	Not rated		Not rated		Not rated	
MOA:							
Martillo----------	60	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.99	Too clayey	0.70	Sodium content	1.00
		Low strength	0.78	Dusty	0.46	Dusty	0.46
				Unstable excavation walls	0.01		
Butcherknife--------	25	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Unstable excavation walls	0.51	Sodium content	1.00
		Low strength	1.00	Too clayey	0.50	Dusty	0.49
				Dusty	0.49		
MPB:							
Melado----------	54	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Too clayey	0.50	Sodium content	1.00
		Low strength	1.00	Dusty	0.50	Too clayey	1.00
				Unstable excavation walls	0.13	Salinity	1.00
						Droughty	0.83
						Dusty	0.50

Table 22.--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
Pantera	38	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Unstable excavation walls	0.77	Droughty	1.00
				Flooding	0.60	Flooding	0.60
				Dusty	0.18	Gravel content	0.46
						Dusty	0.18
MUB:							
Murray	58	Not limited		Somewhat limited		Somewhat limited	
				Dusty	0.19	Dusty	0.19
				Unstable excavation walls	0.01		
Marfa	21	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Dusty	0.41	Dusty	0.41
		Shrink-swell	0.50	Too clayey	0.02		
				Unstable excavation walls	0.01		
Boracho	15	Not limited		Somewhat limited		Very limited	
				Unstable excavation walls	0.51	Depth to cemented pan	1.00
				Dusty	0.31	Droughty	1.00
						Gravel content	1.00
						Dusty	0.31
MZA:							
Musquiz	80	Very limited		Somewhat limited		Somewhat limited	
		Shrink-swell	1.00	Dusty	0.41	Dusty	0.41
		Low strength	1.00	Too clayey	0.13		
				Unstable excavation walls	0.01		
NLA:							
Nillo	90	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.60	Sodium content	1.00
		Low strength	1.00	Dusty	0.40	Too clayey	1.00
		Shrink-swell	0.50	Unstable excavation walls	0.01	Flooding	0.60
						Dusty	0.40
NPB:							
Nolam	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.22	Dusty	0.12	Droughty	0.35
				Unstable excavation walls	0.01	Gravel content	0.32
						Dusty	0.12
Paisano	25	Not limited		Somewhat limited		Very limited	
				Unstable excavation walls	0.51	Depth to cemented pan	1.00
				Dusty	0.07	Droughty	1.00
						Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.07

Table 22.--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
PAC:							
Paisano----------	80	Not limited		Somewhat limited		Very limited	
				Dusty	0.18	Depth to cemented pan	1.00
				Unstable excavation walls	0.01	Droughty	1.00
						Carbonate content	1.00
						Gravel content	0.76
						Dusty	0.18
PAD:							
Paisano----------	80	Not limited		Somewhat limited		Very limited	
				Dusty	0.18	Depth to cemented pan	1.00
				Unstable excavation walls	0.01	Droughty	1.00
						Carbonate content	1.00
						Gravel content	0.76
						Dusty	0.18
PIB:							
Paisano----------	55	Not limited		Somewhat limited		Very limited	
				Dusty	0.18	Depth to cemented pan	1.00
				Unstable excavation walls	0.01	Droughty	1.00
						Carbonate content	1.00
						Gravel content	0.76
						Dusty	0.18
Musgrave----------	35	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	1.00	Dense layer	0.50	Sodium content	1.00
		Shrink-swell	0.50	Dusty	0.39	Dusty	0.39
				Unstable excavation walls	0.01	Droughty	0.07
PKD:							
Pantak----------	46	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
				Dusty	0.17	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Dusty	0.17
Lingua----------	35	Very limited		Not rated		Very limited	
		Depth to hard bedrock	1.00			Depth to bedrock	1.00
						Droughty	1.00
						Gravel content	1.00
						Large stones content	0.39
						Dusty	0.22
PKE:							
Pantak----------	36	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Dusty	0.17	Gravel content	1.00
				Unstable excavation walls	0.01	Slope	1.00
						Dusty	0.17

Table 22.--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
Lingua	24	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
		Large stones	0.80	Large stones	0.80	Large stones content	1.00
				Dusty	0.29	Slope	1.00
				Unstable excavation walls	0.01	Dusty	0.29
Rock outcrop	19	Not rated		Not rated		Not rated	
PTA:							
Phantom	86	Very limited		Somewhat limited		Somewhat limited	
		Shrink-swell	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Unstable excavation walls	0.51	Dusty	0.46
		Low strength	1.00	Dusty	0.46		
				Too clayey	0.32		
PZB:							
Phantom	45	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Too clayey	0.88	Too clayey	1.00
		Low strength	1.00	Unstable excavation walls	0.51	Dusty	0.50
				Dusty	0.50		
Musquiz	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.96	Dusty	0.37	Dusty	0.37
		Low strength	0.22	Unstable excavation walls	0.01		
QBE:							
Quadria	40	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Dusty	0.38	Sodium content	1.00
		Low strength	0.22	Unstable excavation walls	0.01	Dusty	0.38
Nolam	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.57	Dusty	0.38	Droughty	0.66
				Unstable excavation walls	0.01	Dusty	0.38
						Gravel content	0.26
Musgrave	25	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Dense layer	0.50	Sodium content	1.00
		Shrink-swell	0.50	Dusty	0.39	Dusty	0.39
				Unstable excavation walls	0.01	Droughty	0.07

Table 22.--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
RCE:							
Redford----------	52	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Dusty	0.04	Gravel content	1.00
				Unstable excavation walls	0.01	Slope	1.00
						Dusty	0.04
Corazones----------	32	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Dusty	0.02	Gravel content	1.00
				Unstable excavation walls	0.01	Droughty	0.67
						Dusty	0.02
RCG:							
Redford----------	54	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.04	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Dusty	0.04
Corazones----------	36	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Dusty	0.02	Gravel content	1.00
				Unstable excavation walls	0.01	Droughty	0.64
						Dusty	0.02
RED:							
Redlight----------	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.03	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	0.99
						Dusty	0.03
Terlingua----------	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Dusty	0.04	Gravel content	1.00
				Unstable excavation walls	0.01	Slope	1.00
						Dusty	0.04
Rock outcrop--------	24	Not rated		Not rated		Not rated	
REE:							
Reduff----------	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.32	Depth to bedrock	1.00
				Unstable excavation walls	0.06	Slope	1.00
						Dusty	0.32

Table 22.--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
Scotal	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Dusty	0.27	Gravel content	1.00
				Unstable excavation walls	0.01	Slope	1.00
						Dusty	0.27
Holguin	25	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
				Unstable excavation walls	1.00	Depth to bedrock	1.00
				Dusty	0.05	Gravel content	1.00
						Dusty	0.05
RIA:							
Riverwash	50	Not rated		Not rated		Not rated	
Pantera	36	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.80	Flooding	1.00
				Unstable excavation walls	0.01	Droughty	1.00
						Gravel content	0.89
RMB:							
Rockhouse	60	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
				Dusty	0.23	Dusty	0.23
				Unstable excavation walls	0.01		
Medley	27	Not limited		Somewhat limited		Somewhat limited	
				Dusty	0.13	Gravel content	0.28
				Unstable excavation walls	0.01	Dusty	0.13
SCB:							
Sanmoss	65	Not limited		Somewhat limited		Very limited	
				Dusty	0.28	Gravel content	1.00
				Unstable excavation walls	0.01	Dusty	0.28
Medley	25	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Dusty	0.17	Dusty	0.17
				Unstable excavation walls	0.01	Gravel content	0.01
SDC:							
Sauceda	60	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Gravel content	1.00
		Large stones	0.04	Dusty	0.27	Droughty	1.00
				Large stones	0.04	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Dusty	0.27

Table 22.--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
Boludo	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to cemented pan	1.00
		Shrink-swell	0.06	Dusty	0.36	Droughty	1.00
		Large stones	0.01	Unstable excavation walls	0.01	Depth to bedrock	1.00
				Large stones	0.01	Large stones content	0.97
						Dusty	0.36
SEE:							
Sauceda	55	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Gravel content	1.00
		Slope	0.16	Dusty	0.27	Droughty	1.00
		Large stones	0.04	Slope	0.16	Depth to bedrock	1.00
				Large stones	0.04	Dusty	0.27
				Unstable excavation walls	0.01	Slope	0.16
Decoty	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	0.16	Slope	0.16	Depth to bedrock	1.00
				Dusty	0.15	Gravel content	0.97
				Unstable excavation walls	0.01	Slope	0.16
						Dusty	0.15
SHC:							
Scotal	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
				Dusty	0.27	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Dusty	0.27
Holguin	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
				Unstable excavation walls	1.00	Depth to bedrock	1.00
				Dusty	0.05	Gravel content	1.00
						Dusty	0.05
SHE:							
Scotal	65	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Large stones content	1.00
		Slope	0.37	Slope	0.37	Droughty	1.00
				Dusty	0.28	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Slope	0.37
						Dusty	0.28
Rock outcrop	15	Not rated		Not rated		Not rated	

Table 22.--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
SIG:							
Scotal	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.27	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Dusty	0.27
Ohtwo	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.25	Dusty	0.36	Gravel content	1.00
				Unstable excavation walls	0.01	Dusty	0.36
						Large stones content	0.01
Rock outcrop	20	Not rated		Not rated		Not rated	
SRA:							
Straddlebug	80	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Dusty	0.41	Sodium content	1.00
		Shrink-swell	0.54	Unstable excavation walls	0.01	Dusty	0.41
		Flooding	0.40				
STE:							
Strawhouse	50	Not limited		Somewhat limited		Very limited	
				Dusty	0.14	Depth to cemented pan	1.00
				Unstable excavation walls	0.01	Droughty	1.00
						Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.14
Stillwell	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Sodium content	1.00
				Dusty	0.03	Gravel content	1.00
				Unstable excavation walls	0.01	Carbonate content	1.00
						Droughty	0.97
						Slope	0.16
SUD:							
Studybutte	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Dusty	0.14	Gravel content	1.00
				Unstable excavation walls	0.01	Slope	1.00
						Dusty	0.14
SUE:							
Studybutte	60	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Dusty	0.26	Slope	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Dusty	0.26

Table 22.--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
Rock outcrop--------	25	Not rated		Not rated		Not rated	
SUG:							
Studybutte----------	60	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.26	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Dusty	0.26
Rock outcrop--------	30	Not rated		Not rated		Not rated	
TEA:							
Tenneco----------	70	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Dusty	0.49	Dusty	0.49
		Flooding	0.40	Unstable excavation walls	0.01		
Bodecker----------	15	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
				Dusty	0.13	Droughty	0.15
				Unstable excavation walls	0.01	Dusty	0.13
TRE:							
Terlingua----------	70	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Dusty	0.05	Slope	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Large stones content	0.16
Rock outcrop--------	25	Not rated		Not rated		Not rated	
TRG:							
Terlingua----------	65	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
				Dusty	0.05	Droughty	1.00
				Unstable excavation walls	0.01	Gravel content	1.00
						Dusty	0.05
Rock outcrop--------	30	Not rated		Not rated		Not rated	
VAA:							
Verhalen----------	80	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Unstable excavation walls	0.51	Too clayey	1.00
		Low strength	1.00	Dusty	0.50	Dusty	0.50
		Flooding	0.40	Too clayey	0.28		
VCA:							
Vicente----------	30	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Shrink-swell	0.50	Dusty	0.35	Dusty	0.35
				Unstable excavation walls	0.01		

Table 22.--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
Lomapelona----------	29	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
				Dusty	0.18	Dusty	0.18
				Unstable excavation walls	0.01		
Castolon----------	25	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Dusty	0.50	Dusty	0.50
		Shrink-swell	0.50	Unstable excavation walls	0.01		
VOC:							
Volco----------	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
				Dusty	0.31	Droughty	1.00
				Unstable excavation walls	0.01	Gravel content	0.99
						Dusty	0.31
						Large stones content	0.01
Pardo----------	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to cemented pan	1.00
		Shrink-swell	0.50	Dusty	0.36	Depth to bedrock	1.00
				Unstable excavation walls	0.01	Droughty	1.00
						Dusty	0.36
						Gravel content	0.12
W:							
Water----------	100	Not rated		Not rated		Not rated	

Table 23.--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: Rating class and limiting features	Value	Sewage Lagoons: Rating class and limiting features	Value
ALB:					
Altar	45	Somewhat limited		Very limited	
		Flooding	0.40	Seepage	1.00
				Flooding	0.40
				Slope	0.08
Bodecker	30	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
		Large stones	0.23	Large stones	0.99
Riverwash	15	Not rated		Not rated	
ANS:					
Area not surveyed	100	Not rated		Not rated	
BAC:					
Baviza	75	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.32
Pantera	21	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
BEB:					
Berrend	72	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
		Seepage, bottom layer	1.00	Slope	0.08
Espy	17	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	0.50
BIC:					
Bissett	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.32
Rock outcrop	20	Not rated		Not rated	
BIE:					
Bissett	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop	25	Not rated		Not rated	

Table 23.--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
BIG:					
Bissett----------	70	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop--------	25	Not rated		Not rated	
BLE:					
Blackgap----------	52	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.37	Large stones	1.00
Rock outcrop--------	45	Not rated		Not rated	
BLG:					
Blackgap----------	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.37	Large stones	1.00
Rock outcrop--------	20	Not rated		Not rated	
BNE:					
Bofecillos----------	47	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Horsetrap----------	21	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
				Large stones	0.04
Rock outcrop--------	17	Not rated		Not rated	
BNG:					
Bofecillos----------	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop--------	40	Not rated		Not rated	
BOB:					
Boracho----------	60	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Seepage, bottom layer	1.00	Seepage	1.00

Table 23.--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
Espy----------	20	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.08
BOC:					
Borunda----------	60	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Depth to hard bedrock	0.99
				Slope	0.32
Borunda, gravelly---	20	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Depth to hard bedrock	0.99
				Slope	0.32
BRD:					
Brewster----------	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	1.00
BRF:					
Brewster----------	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop--------	15	Not rated		Not rated	
BRG:					
Brewster----------	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.99	Large stones	1.00
Rock outcrop--------	25	Not rated		Not rated	
BUD:					
Buckear----------	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	1.00
Coyanosa----------	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.37	Slope	1.00

Table 23.--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
CAA:					
Castolon	79	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00		
CAG:					
Catto	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Buckear	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
Rock outcrop	10	Not rated		Not rated	
CIC:					
Chilicotal	80	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.08
CID:					
Chilicotal	80	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
CLC:					
Chilicotal	61	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.08
Paisano	32	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	1.00
				Slope	0.08
CMC:					
Chilimol	45	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
Boracho	32	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.68
Berrend	13	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Slope	0.68

Table 23.--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
CND:					
Chinati	54	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to cemented pan	1.00
				Slope	0.92
Boracho	19	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Large stones	0.01	Slope	1.00
				Large stones	0.37
Berrend	12	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50	Slope	0.68
CNE:					
Chinati	50	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Depth to cemented pan	1.00
		Slope	0.16	Slope	1.00
Boracho	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slope	0.63	Slope	1.00
COC:					
Corazones	50	Not limited		Very limited	
				Seepage	1.00
				Slope	0.68
Ojinaga	40	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	1.00
				Slope	0.68
COE:					
Corazones	61	Very limited		Very limited	
		Slope	1.00	Slope	1.00
				Seepage	1.00
Ojinaga	26	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00

Table 23.--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
CVC:					
Costavar	53	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.32
Volco	19	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.99	Large stones	1.00
				Slope	0.32
EEB:					
Espy	56	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	0.50
Eppenauer	39	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Seepage	0.50
GAA:					
Galindo	76	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Seepage	1.00
GEF:					
Geefour	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
Geefour, eroded	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
GFF:					
Geefour	53	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
Corazones	21	Very limited		Very limited	
		Slope	1.00	Seepage	1.00
		Large stones	0.22	Slope	1.00
				Large stones	0.12
Ojinaga	13	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	0.16	Seepage	1.00
				Slope	1.00

Table 23.--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
GMF:					
Geefour	49	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	1.00		
Melado	31	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
GSA:					
Gemelo	60	Not limited		Very limited	
				Seepage	1.00
Straddlebug	25	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
HOB:					
Holguin	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.68
HOD:					
Horsetrap	57	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	1.00
				Seepage	0.50
Bofecillos	28	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	1.00
Rock outcrop	10	Not rated		Not rated	
KIB:					
Kinco	80	Not limited		Very limited	
				Seepage	1.00
LGC:					
Lingua	70	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.32
LIF:					
Lingua	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Ohtwo	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
		Depth to bedrock	0.07		

Table 23.--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
MAE:					
Manzanillo----------	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00
Paisano----------	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	1.00	Seepage	1.00
				Slope	1.00
MBE:					
Manzanillo----------	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
				Large stones	0.02
Chilicotal----------	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
				Large stones	0.09
Holguin----------	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
MCA:					
Marfa----------	92	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Seepage	0.50
		Seepage, bottom layer	1.00		
MDE:					
Mariscal----------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.68	Large stones	1.00
Rock outcrop--------	15	Not rated		Not rated	
MOA:					
Martillo----------	60	Very limited		Not limited	
		Slow water movement	1.00		

Table 23.--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
Butcherknife--------	25	Very limited		Somewhat limited	
		Slow water movement	1.00	Depth to soft bedrock	0.99
		Depth to bedrock	0.99		
MPB:					
Melado----------	54	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
Pantera----------	38	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.08
MUB:					
Murray----------	58	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
Marfa----------	21	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
		Seepage, bottom layer	1.00		
Boracho----------	15	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
MZA:					
Musquiz----------	80	Very limited		Not limited	
		Slow water movement	1.00		
NLA:					
Nillo----------	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Seepage	0.50
NPB:					
Nolam----------	55	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
Paisano----------	25	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	1.00
PAC:					
Paisano----------	80	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	1.00
				Slope	0.08

Table 23.--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
PAD:					
Paisano	80	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	1.00
				Slope	1.00
PIB:					
Paisano	55	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	1.00
				Slope	0.08
Musgrave	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	1.00	Slope	0.32
PKD:					
Pantak	46	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	1.00
Lingua	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.32
PKE:					
Pantak	36	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Lingua	24	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.80	Large stones	1.00
Rock outcrop	19	Not rated		Not rated	
PTA:					
Phantom	86	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00		
PZB:					
Phantom	45	Very limited		Not limited	
		Slow water movement	1.00		
Musquiz	39	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50

Table 23.--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
QBE:					
Quadria	40	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
Nolam	30	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
Musgrave	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	1.00		
RCE:					
Redford	52	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00
Corazones	32	Very limited		Very limited	
		Slope	1.00	Slope	1.00
				Seepage	1.00
RCG:					
Redford	54	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00
Corazones	36	Very limited		Very limited	
		Slope	1.00	Slope	1.00
				Seepage	1.00
RED:					
Redlight	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
Terlingua	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop	24	Not rated		Not rated	
REE:					
Reduff	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50

Table 23.--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
Scotal	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Holguin	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Seepage	1.00
				Slope	0.32
				Large stones	0.05
RIA:					
Riverwash	50	Not rated		Not rated	
Pantera	36	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
RMB:					
Rockhouse	60	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Medley	27	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.08
SCB:					
Sanmoss	65	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50	Slope	0.08
Medley	25	Somewhat limited		Very limited	
		Slow water movement	0.50	Seepage	1.00
				Slope	0.08
SDC:					
Sauceda	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.04	Large stones	0.62
				Slope	0.32
Boludo	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Large stones	0.01	Slope	0.32
				Large stones	0.29

Table 23.--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
SEE:					
Sauceda	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Slope	1.00
		Large stones	0.04	Large stones	0.62
Decoty	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Seepage	1.00
				Slope	1.00
				Large stones	0.07
SHC:					
Scotal	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.68
Holguin	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Seepage	1.00
				Slope	0.32
				Large stones	0.05
SHE:					
Scotal	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.37	Slope	1.00
Rock outcrop	15	Not rated		Not rated	
SIG:					
Scotal	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Ohtwo	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
		Depth to bedrock	0.07		
Rock outcrop	20	Not rated		Not rated	
SRA:					
Straddlebug	80	Very limited		Very limited	
		Slow water movement	1.00	Seepage	1.00
		Flooding	0.40	Flooding	0.40

Table 23.--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
STE:					
Strawhouse----------	50	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Slope	0.68
				Seepage	0.50
Stillwell----------	35	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
SUD:					
Studybutte----------	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
SUE:					
Studybutte----------	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop--------	25	Not rated		Not rated	
SUG:					
Studybutte----------	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop--------	30	Not rated		Not rated	
TEA:					
Tenneco----------	70	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
		Flooding	0.40	Flooding	0.40
Bodecker----------	15	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	0.50	Seepage	1.00
TRE:					
Terlingua----------	70	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop--------	25	Not rated		Not rated	
TRG:					
Terlingua----------	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00

Table 23.--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
Rock outcrop--------	30	Not rated		Not rated	
VAA:					
Verhalen----------	80	Very limited		Somewhat limited	
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
VCA:					
Vicente----------	30	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	0.50	Seepage	0.50
Lomapelona----------	29	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00		
Castolon----------	25	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00		
VOC:					
Volco----------	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Seepage	0.50
				Slope	0.32
Pardo----------	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Slope	0.32
W:					
Water----------	100	Not rated		Not rated	

Table 24.--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
ALB:							
Altar	45	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Gravel content	1.00
		Dusty	0.06	Dusty	0.06	Seepage	0.43
						Dusty	0.06
Bodecker	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Too sandy	1.00			Too sandy	1.00
		Large stones	0.06			Gravel content	1.00
						Large stones	0.06
Riverwash	15	Not rated		Not rated		Not rated	
ANS:							
Area not surveyed	100	Not rated		Not rated		Not rated	
BAC:							
Baviza	75	Very limited		Not limited		Very limited	
		Too sandy	1.00			Seepage	1.00
						Too sandy	1.00
Pantera	21	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Too sandy	1.00			Too sandy	1.00
						Gravel content	1.00
BEB:							
Berrend	72	Very limited		Somewhat limited		Somewhat limited	
		Seepage, bottom layer	1.00	Dusty	0.16	Dusty	0.16
		Dusty	0.16				
Espy	17	Somewhat limited		Very limited		Very limited	
		Depth to thin cemented pan	0.50	Depth to cemented pan	1.00	Depth to cemented pan	1.00
BIC:							
Bissett	65	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.32	Depth to bedrock	1.00
		Dusty	0.32			Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.32
Rock outcrop	20	Not rated		Not rated		Not rated	
BIE:							
Bissett	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.32	Gravel content	1.00
		Dusty	0.32			Slope	1.00
						Carbonate content	1.00
						Dusty	0.32

Table 24.--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
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.32	Depth to bedrock	1.00
		Dusty	0.32			Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.32
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BLE:							
Blackgap----------	52	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.41	Slope	1.00
		Dusty	0.41			Carbonate content	1.00
		Large stones	0.37			Dusty	0.41
						Large stones	0.37
Rock outcrop--------	45	Not rated		Not rated		Not rated	
BLG:							
Blackgap----------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.41	Depth to bedrock	1.00
		Dusty	0.41			Carbonate content	1.00
		Large stones	0.37			Dusty	0.41
						Large stones	0.37
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BNE:							
Bofecillos----------	47	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.10	Gravel content	1.00
		Dusty	0.10			Slope	1.00
						Dusty	0.10
Horsetrap----------	21	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.10	Gravel content	1.00
		Dusty	0.10			Slope	1.00
						Dusty	0.10
Rock outcrop--------	17	Not rated		Not rated		Not rated	
BNG:							
Bofecillos----------	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.31	Slope	1.00
		Dusty	0.31			Gravel content	0.97
						Dusty	0.31
Rock outcrop--------	40	Not rated		Not rated		Not rated	

Table 24.--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
BOB:							
Boracho	60	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	0.50	Seepage	1.00	Gravel content	1.00
		Dusty	0.12	Dusty	0.12	Dusty	0.12
Espy	20	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	0.50	Seepage	1.00	Gravel content	0.92
		Dusty	0.32	Dusty	0.32	Dusty	0.32
BOC:							
Borunda	60	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.50	Hard to compact	1.00
		Dusty	0.50			Depth to bedrock	1.00
						Dusty	0.50
Borunda, gravelly	20	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.43	Depth to bedrock	1.00
		Dusty	0.43			Dusty	0.43
BRD:							
Brewster	75	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.38	Depth to bedrock	1.00
		Dusty	0.38			Gravel content	1.00
						Dusty	0.38
BRF:							
Brewster	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.32	Gravel content	1.00
		Dusty	0.32			Slope	1.00
						Dusty	0.32
Rock outcrop	15	Not rated		Not rated		Not rated	
BRG:							
Brewster	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.38	Depth to bedrock	1.00
		Large stones	0.99			Large stones	0.99
		Dusty	0.38			Dusty	0.38
Rock outcrop	25	Not rated		Not rated		Not rated	
BUD:							
Buckear	55	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.27	Depth to bedrock	1.00
		Dusty	0.27			Gravel content	0.99
						Dusty	0.27

Table 24.--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
Coyanosa	35	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.37	Depth to bedrock	1.00
		Slope	0.37	Dusty	0.01	Gravel content	1.00
		Dusty	0.01			Slope	0.37
						Dusty	0.01
CAA:							
Castolon	79	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Dusty	0.50
		Dusty	0.50	Dusty	0.50		
CAG:							
Catto	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.27	Depth to bedrock	1.00
		Dusty	0.27			Gravel content	1.00
						Dusty	0.27
Buckear	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.27	Depth to bedrock	1.00
		Dusty	0.27			Gravel content	0.99
						Dusty	0.27
Rock outcrop	10	Not rated		Not rated		Not rated	
CIC:							
Chilicotal	80	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.27	Dusty	0.27	Gravel content	1.00
						Dusty	0.27
CID:							
Chilicotal	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Gravel content	1.00
		Dusty	0.27	Dusty	0.27	Slope	0.37
						Dusty	0.27
CLC:							
Chilicotal	61	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.18	Dusty	0.18	Gravel content	0.72
						Dusty	0.18
Paisano	32	Somewhat limited		Somewhat limited		Very limited	
		Depth to thin cemented pan	0.50	Dusty	0.19	Depth to cemented pan	1.00
		Dusty	0.19			Gravel content	1.00
						Carbonate content	1.00
						Seepage	0.50
						Dusty	0.19
CMC:							
Chilimol	45	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.34	Dusty	0.34	Gravel content	1.00
						Dusty	0.34

Table 24.--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
Boracho----------	32	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	0.50	Seepage	1.00	Gravel content	1.00
		Dusty	0.04	Dusty	0.04	Dusty	0.04
Berrend----------	13	Very limited		Somewhat limited		Somewhat limited	
		Seepage, bottom layer	1.00	Dusty	0.27	Dusty	0.27
		Dusty	0.27				
CND:							
Chinati----------	54	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	0.50	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.30	Dusty	0.30	Gravel content	0.99
						Dusty	0.30
Boracho----------	19	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	0.50	Seepage	1.00	Gravel content	0.74
		Dusty	0.36	Dusty	0.36	Dusty	0.36
		Too clayey	0.06			Too clayey	0.06
		Large stones	0.01			Large stones	0.01
Berrend----------	12	Very limited		Somewhat limited		Somewhat limited	
		Seepage, bottom layer	1.00	Dusty	0.16	Seepage	0.50
		Dusty	0.16			Dusty	0.16
CNE:							
Chinati----------	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thick cemented pan	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Too sandy	1.00	Slope	0.16	Depth to bedrock	1.00
		Slope	0.16	Dusty	0.07	Too sandy	1.00
		Dusty	0.07			Seepage	0.50
Boracho----------	30	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slope	0.63	Seepage	1.00	Gravel content	1.00
		Depth to thin cemented pan	0.50	Slope	0.63	Slope	0.63
		Dusty	0.28	Dusty	0.28	Seepage	0.50
						Dusty	0.28

Table 24.--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
COC:							
Corazones	50	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.50	Dusty	0.02	Gravel content	1.00
		Dusty	0.02			Seepage	0.50
						Too sandy	0.50
						Dusty	0.02
Ojinaga	40	Somewhat limited		Somewhat limited		Very limited	
		Depth to thin cemented pan	0.50	Dusty	0.04	Depth to cemented pan	1.00
		Dusty	0.04			Gravel content	1.00
						Seepage	0.50
						Dusty	0.04
COE:							
Corazones	61	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Dusty	0.02	Dusty	0.02	Slope	1.00
						Seepage	0.50
						Dusty	0.02
Ojinaga	26	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	0.50	Dusty	0.28	Gravel content	1.00
		Dusty	0.28			Slope	1.00
						Seepage	0.50
						Dusty	0.28
CVC:							
Costavar	53	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.13	Depth to bedrock	1.00
		Dusty	0.13			Gravel content	1.00
						Dusty	0.13
Volco	19	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones	0.99	Dusty	0.31	Large stones	0.99
		Dusty	0.31			Dusty	0.31
EEB:							
Espy	56	Somewhat limited		Very limited		Very limited	
		Depth to thin cemented pan	0.50	Depth to cemented pan	1.00	Depth to cemented pan	1.00
Eppenauer	39	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.09	Depth to bedrock	1.00
		Dusty	0.09			Dusty	0.09
GAA:							
Galindo	76	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too sandy	1.00
		Too sandy	1.00	Dusty	0.50	Seepage	0.50
		Dusty	0.50			Dusty	0.50

Table 24.--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
GEF:							
Geefour----------	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.49	Hard to compact	1.00
		Excess salt	1.00			Slope	1.00
		Dusty	0.49			Dusty	0.49
Geefour, eroded-----	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.50	Hard to compact	1.00
		Excess salt	1.00			Slope	1.00
		Dusty	0.50			Dusty	0.50
GFF:							
Geefour----------	53	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.44	Hard to compact	1.00
		Excess salt	1.00			Slope	1.00
		Dusty	0.44			Dusty	0.44
Corazones----------	21	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.02	Dusty	0.02	Gravel content	0.83
		Large stones	0.01			Seepage	0.50
						Dusty	0.02
						Large stones	0.01
Ojinaga----------	13	Somewhat limited		Somewhat limited		Very limited	
		Depth to thin cemented pan	0.50	Slope	0.16	Depth to cemented pan	1.00
		Slope	0.16	Dusty	0.03	Gravel content	1.00
		Dusty	0.03			Seepage	0.50
						Slope	0.16
						Dusty	0.03
GMF:							
Geefour----------	49	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.50	Hard to compact	1.00
		Dusty	0.50			Slope	1.00
						Dusty	0.50
Melado----------	31	Very limited		Somewhat limited		Very limited	
		Excess salt	1.00	Dusty	0.50	Hard to compact	1.00
		Dusty	0.50			Dusty	0.50
GSA:							
Gemelo----------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.08	Dusty	0.08	Seepage	0.50
						Gravel content	0.16
						Dusty	0.08
Straddlebug---------	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.41	Dusty	0.41	Seepage	0.50
						Dusty	0.41

Table 24.--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
HOB:							
Holguin----------	85	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Gravel content	1.00
						Seepage	0.50
HOD:							
Horsetrap----------	57	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.14	Depth to bedrock	1.00
		Dusty	0.14			Gravel content	0.99
						Dusty	0.14
Bofecillos----------	28	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.06	Depth to bedrock	1.00
		Dusty	0.06			Gravel content	1.00
						Dusty	0.06
Rock outcrop--------	10	Not rated		Not rated		Not rated	
KIB:							
Kinco----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.04	Dusty	0.04	Seepage	0.50
						Dusty	0.04
						Gravel content	0.03
LGC:							
Lingua----------	70	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.22	Depth to bedrock	1.00
		Dusty	0.22			Gravel content	1.00
						Dusty	0.22
LIF:							
Lingua----------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.22	Depth to bedrock	1.00
		Dusty	0.22			Gravel content	1.00
						Dusty	0.22
Ohtwo----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.36	Gravel content	0.95
		Dusty	0.36			Dusty	0.36
MAE:							
Manzanillo----------	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to thick cemented pan	1.00	Dusty	0.02	Depth to cemented pan	1.00
		Slope	1.00			Slope	1.00
		Too sandy	1.00			Too sandy	1.00
		Dusty	0.02			Gravel content	0.99
Paisano----------	30	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Slope	1.00	Depth to cemented pan	1.00
		Slope	1.00	Dusty	0.26	Slope	1.00
		Dusty	0.26			Carbonate content	1.00
						Gravel content	0.97
						Seepage	0.50

Table 24.--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
MBE:							
Manzanillo----------	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.09	Depth to cemented pan	1.00
		Depth to thin cemented pan	0.50			Gravel content	1.00
		Dusty	0.09			Slope	1.00
						Dusty	0.09
Chilicotal----------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Dusty	0.11	Dusty	0.11	Slope	1.00
						Dusty	0.11
Holguin----------	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.01	Gravel content	1.00
		Dusty	0.01			Slope	1.00
						Seepage	0.50
						Dusty	0.01
MCA:							
Marfa----------	92	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Hard to compact	1.00
		Seepage, bottom layer	1.00	Dusty	0.40	Dusty	0.40
		Dusty	0.40			Too clayey	0.05
		Too clayey	0.05				
MDE:							
Mariscal----------	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.27	Slope	1.00
		Large stones	0.68			Carbonate content	1.00
		Dusty	0.27			Large stones	0.68
						Gravel content	0.27
Rock outcrop--------	15	Not rated		Not rated		Not rated	
MOA:							
Martillo----------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.46	Dusty	0.46	Dusty	0.46
Butcherknife--------	25	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.49	Hard to compact	1.00
		Dusty	0.49			Depth to bedrock	0.99
						Dusty	0.49
MPB:							
Melado----------	54	Very limited		Somewhat limited		Very limited	
		Excess salt	1.00	Dusty	0.50	Hard to compact	1.00
		Dusty	0.50			Dusty	0.50
Pantera----------	38	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Too sandy	1.00	Dusty	0.18	Too sandy	1.00
		Dusty	0.18			Gravel content	1.00
						Dusty	0.18

Table 24.--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
MUB:							
Murray	58	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.19	Dusty	0.19	Dusty	0.19
Marfa	21	Very limited		Somewhat limited		Very limited	
		Seepage, bottom layer	1.00	Dusty	0.41	Hard to compact	1.00
		Dusty	0.41			Dusty	0.41
		Too clayey	0.12			Too clayey	0.12
Boracho	15	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Too sandy	1.00	Seepage	1.00	Gravel content	1.00
		Depth to thin cemented pan	0.50	Dusty	0.31	Too sandy	1.00
		Dusty	0.31			Seepage	0.50
						Dusty	0.31
MZA:							
Musquiz	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.61	Dusty	0.41	Too clayey	0.61
		Dusty	0.41			Dusty	0.41
NLA:							
Nillo	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Dusty	0.40
		Dusty	0.40	Dusty	0.40		
NPB:							
Nolam	55	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.12	Dusty	0.12	Gravel content	1.00
						Dusty	0.12
Paisano	25	Somewhat limited		Somewhat limited		Very limited	
		Depth to thin cemented pan	0.50	Dusty	0.07	Depth to cemented pan	1.00
		Dusty	0.07			Gravel content	1.00
						Carbonate content	1.00
						Seepage	0.09
						Dusty	0.07
PAC:							
Paisano	80	Somewhat limited		Somewhat limited		Very limited	
		Depth to thin cemented pan	0.50	Dusty	0.18	Depth to cemented pan	1.00
		Dusty	0.18			Carbonate content	1.00
						Gravel content	0.99
						Seepage	0.50
						Dusty	0.18
PAD:							
Paisano	80	Somewhat limited		Somewhat limited		Very limited	
		Depth to thin cemented pan	0.50	Dusty	0.18	Depth to cemented pan	1.00
		Dusty	0.18			Carbonate content	1.00
						Gravel content	0.99
						Seepage	0.50
						Dusty	0.18

Table 24.--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
PIB:							
Paisano	55	Somewhat limited		Somewhat limited		Very limited	
		Depth to thin cemented pan	0.50	Dusty	0.18	Depth to cemented pan	1.00
		Dusty	0.18			Carbonate content	1.00
						Gravel content	0.99
						Seepage	0.50
						Dusty	0.18
Musgrave	35	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.39	Depth to bedrock	1.00
		Dusty	0.39			Dusty	0.39
PKD:							
Pantak	46	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.17	Depth to bedrock	1.00
		Dusty	0.17			Gravel content	1.00
						Dusty	0.17
Lingua	35	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.22	Depth to bedrock	1.00
		Dusty	0.22			Gravel content	1.00
						Dusty	0.22
PKE:							
Pantak	36	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.17	Gravel content	1.00
		Dusty	0.17			Slope	1.00
						Dusty	0.17
Lingua	24	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.29	Slope	1.00
		Large stones	0.80			Large stones	0.80
		Dusty	0.29			Dusty	0.29
						Gravel content	0.11
Rock outcrop	19	Not rated		Not rated		Not rated	
PTA:							
Phantom	86	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Hard to compact	1.00
		Too clayey	0.89	Dusty	0.46	Too clayey	0.89
		Dusty	0.46			Dusty	0.46
PZB:							
Phantom	45	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Dusty	0.50	Hard to compact	1.00
		Dusty	0.50			Too clayey	1.00
						Dusty	0.50
Musquiz	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.37	Dusty	0.37	Dusty	0.37
		Too clayey	0.21			Too clayey	0.21

Table 24.--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
QBE:							
Quadria	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.38	Dusty	0.38	Dusty	0.38
Nolam	30	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.38	Dusty	0.38	Gravel content	1.00
						Seepage	0.43
						Dusty	0.38
Musgrave	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.39	Slope	1.00
		Dusty	0.39			Dusty	0.39
RCE:							
Redford	52	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.04	Slope	1.00
		Dusty	0.04			Gravel content	0.99
						Seepage	0.50
						Dusty	0.04
Corazones	32	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Dusty	0.02	Dusty	0.02	Slope	1.00
						Seepage	0.50
						Dusty	0.02
RCG:							
Redford	54	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.04	Depth to bedrock	1.00
		Dusty	0.04			Gravel content	1.00
						Seepage	0.50
						Dusty	0.04
Corazones	36	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.02	Dusty	0.02	Gravel content	1.00
						Seepage	0.50
						Dusty	0.02
RED:							
Redlight	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.03	Depth to bedrock	1.00
		Dusty	0.03			Gravel content	1.00
						Dusty	0.03
Terlingua	15	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.04	Gravel content	1.00
		Dusty	0.04			Slope	1.00
						Dusty	0.04
Rock outcrop	24	Not rated		Not rated		Not rated	

Table 24.--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
REE:							
Reduff	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.32	Gravel content	1.00
		Dusty	0.32			Slope	1.00
						Dusty	0.32
Scotal	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.27	Gravel content	1.00
		Dusty	0.27			Slope	1.00
						Dusty	0.27
Holguin	25	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.05	Depth to bedrock	1.00
		Dusty	0.05			Gravel content	0.99
						Seepage	0.43
						Dusty	0.05
RIA:							
Riverwash	50	Not rated		Not rated		Not rated	
Pantera	36	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Too sandy	0.50			Gravel content	1.00
						Too sandy	0.50
RMB:							
Rockhouse	60	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Gravel content	0.93
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
		Dusty	0.23	Dusty	0.23	Dusty	0.23
Medley	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.13	Dusty	0.13	Dusty	0.13
SCB:							
Sanmoss	65	Very limited		Somewhat limited		Somewhat limited	
		Seepage, bottom layer	1.00	Dusty	0.28	Gravel content	0.99
		Dusty	0.28			Dusty	0.28
Medley	25	Somewhat limited		Very limited		Somewhat limited	
		Dusty	0.17	Seepage	1.00	Dusty	0.17
				Dusty	0.17		
SDC:							
Sauceda	60	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.27	Depth to bedrock	1.00
		Dusty	0.27			Gravel content	0.34
		Large stones	0.04			Dusty	0.27
						Large stones	0.04

Table 24.--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
Boludo	20	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.36	Depth to bedrock	1.00
		Depth to thin cemented pan	0.50			Depth to cemented pan	1.00
		Dusty	0.36			Dusty	0.36
		Large stones	0.01			Gravel content	0.29
						Large stones	0.01
SEE:							
Sauceda	55	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.27	Depth to bedrock	1.00
		Dusty	0.27	Slope	0.16	Gravel content	0.34
		Slope	0.16			Dusty	0.27
		Large stones	0.04			Slope	0.16
						Large stones	0.04
Decoty	40	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.16	Depth to bedrock	1.00
		Slope	0.16	Dusty	0.15	Gravel content	0.89
		Dusty	0.15			Seepage	0.43
						Slope	0.16
						Dusty	0.15
SHC:							
Scotal	50	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.27	Depth to bedrock	1.00
		Dusty	0.27			Gravel content	1.00
						Dusty	0.27
Holguin	35	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Dusty	0.05	Depth to bedrock	1.00
		Dusty	0.05			Gravel content	0.99
						Seepage	0.50
						Dusty	0.05
SHE:							
Scotal	65	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.37	Depth to bedrock	1.00
		Slope	0.37	Dusty	0.28	Gravel content	1.00
		Dusty	0.28			Slope	0.37
						Dusty	0.28
Rock outcrop	15	Not rated		Not rated		Not rated	
SIG:							
Scotal	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.27	Depth to bedrock	1.00
		Dusty	0.27			Gravel content	1.00
						Dusty	0.27
Ohtwo	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.36	Gravel content	0.95
		Dusty	0.36			Dusty	0.36
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 24.--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
SRA:							
Straddlebug---------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.41	Dusty	0.41	Seepage	0.50
		Flooding	0.40	Flooding	0.40	Dusty	0.41
STE:							
Strawhouse----------	50	Very limited		Somewhat limited		Very limited	
		Depth to thick cemented pan	1.00	Dusty	0.14	Depth to cemented pan	1.00
		Dusty	0.14			Gravel content	1.00
						Carbonate content	1.00
						Dusty	0.14
Stillwell----------	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Gravel content	1.00
		Dusty	0.03	Dusty	0.03	Carbonate content	1.00
						Slope	0.16
						Dusty	0.03
SUD:							
Studybutte----------	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.14	Gravel content	1.00
		Dusty	0.14			Slope	1.00
						Dusty	0.14
SUE:							
Studybutte----------	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.26	Gravel content	1.00
		Dusty	0.26			Slope	1.00
						Seepage	0.50
						Dusty	0.26
Rock outcrop--------	25	Not rated		Not rated		Not rated	
SUG:							
Studybutte----------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.26	Depth to bedrock	1.00
		Dusty	0.26			Gravel content	1.00
						Seepage	0.50
						Dusty	0.26
Rock outcrop--------	30	Not rated		Not rated		Not rated	
TEA:							
Tenneco----------	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.49	Dusty	0.49	Dusty	0.49
		Flooding	0.40	Flooding	0.40		
Bodecker----------	15	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Gravel content	0.72
		Dusty	0.13	Dusty	0.13	Dusty	0.13

Table 24.--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
TRE:							
Terlingua----------	70	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00	Dusty	0.05	Gravel content	1.00
		Dusty	0.05			Slope	1.00
						Seepage	0.50
						Dusty	0.05
Rock outcrop--------	25	Not rated		Not rated		Not rated	
TRG:							
Terlingua----------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Dusty	0.05	Depth to bedrock	1.00
		Dusty	0.05			Gravel content	1.00
						Seepage	0.50
						Dusty	0.05
Rock outcrop--------	30	Not rated		Not rated		Not rated	
VAA:							
Verhalen----------	80	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Hard to compact	1.00
		Flooding	0.40	Flooding	0.40	Dusty	0.50
VCA:							
Vicente----------	30	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Dusty	0.35
		Dusty	0.35	Dusty	0.35		
Lomapelona----------	29	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Dusty	0.18
		Dusty	0.18	Dusty	0.18		
Castolon----------	25	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Dusty	0.50
		Dusty	0.50	Dusty	0.50		
VOC:							
Volco----------	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.31	Dusty	0.31	Gravel content	1.00
						Dusty	0.31
Pardo----------	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Depth to thin cemented pan	0.50	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Dusty	0.36	Dusty	0.36	Gravel content	0.84
		Too clayey	0.01			Dusty	0.36
						Too clayey	0.01
W:							
Water----------	100	Not rated		Not rated		Not rated	

Table 25.--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	Gravel Source		Sand Source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
ALB:					
Altar	45	Fair		Fair	
		Thickest layer	0.55	Bottom layer	0.01
		Bottom layer	0.60	Thickest layer	0.09
Bodecker	30	Fair		Fair	
		Bottom layer	0.37	Bottom layer	0.00
		Thickest layer	0.37	Thickest layer	0.22
Riverwash	15	Not rated		Not rated	
ANS:					
Area not surveyed	100	Not rated		Not rated	
BAC:					
Baviza	75	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.79
		Thickest layer	0.00	Thickest layer	0.91
Pantera	21	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.51
		Bottom layer	0.33	Thickest layer	0.66
BEB:					
Berrend	72	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.01
Espy	17	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.12
BIC:					
Bissett	65	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.20	Thickest layer	0.00
Rock outcrop	20	Not rated		Not rated	
BIE:					
Bissett	60	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.20	Thickest layer	0.00
Rock outcrop	25	Not rated		Not rated	
BIG:					
Bissett	70	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.20	Thickest layer	0.00

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
Rock outcrop--------	25	Not rated		Not rated	
BLE:					
Blackgap----------	52	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop--------	45	Not rated		Not rated	
BLG:					
Blackgap----------	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop--------	20	Not rated		Not rated	
BNE:					
Bofecillos----------	47	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
Horsetrap----------	21	Fair		Fair	
		Thickest layer	0.03	Bottom layer	0.00
		Bottom layer	0.55	Thickest layer	0.06
Rock outcrop--------	17	Not rated		Not rated	
BNG:					
Bofecillos----------	45	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.05	Thickest layer	0.00
Rock outcrop--------	40	Not rated		Not rated	
BOB:					
Boracho----------	60	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.40	Thickest layer	0.05
Espy----------	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BOC:					
Borunda----------	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Borunda, gravelly---	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BRD:					
Brewster----------	75	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.35	Thickest layer	0.00

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
BRF:					
Brewster	65	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Rock outcrop	15	Not rated		Not rated	
BRG:					
Brewster	60	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Rock outcrop	25	Not rated		Not rated	
BUD:					
Buckear	55	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Coyanosa	35	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.01
		Bottom layer	0.48	Thickest layer	0.10
CAA:					
Castolon	79	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CAG:					
Catto	50	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.40	Thickest layer	0.00
Buckear	35	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Rock outcrop	10	Not rated		Not rated	
CIC:					
Chilicotal	80	Fair		Fair	
		Bottom layer	0.30	Bottom layer	0.00
		Thickest layer	0.30	Thickest layer	0.01
CID:					
Chilicotal	80	Fair		Fair	
		Bottom layer	0.30	Bottom layer	0.00
		Thickest layer	0.30	Thickest layer	0.01
CLC:					
Chilicotal	61	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.13	Thickest layer	0.00
Paisano	32	Fair		Fair	
		Thickest layer	0.04	Bottom layer	0.00
		Bottom layer	0.50	Thickest layer	0.01

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
CMC:					
Chilimol	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Boracho	32	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.63	Thickest layer	0.09
Berrend	13	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.01
CND:					
Chinati	54	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Boracho	19	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Berrend	12	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.07
CNE:					
Chinati	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.08
Boracho	30	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.05	Thickest layer	0.00
COC:					
Corazones	50	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.14
		Bottom layer	0.15	Thickest layer	0.18
Ojinaga	40	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.09
		Bottom layer	0.08	Bottom layer	0.14
COE:					
Corazones	61	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.12
		Bottom layer	0.15	Bottom layer	0.28
Ojinaga	26	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CVC:					
Costavar	53	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.04

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
Volco	19	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
EEB:					
Espy	56	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.07
		Thickest layer	0.00	Thickest layer	0.12
Eppenauer	39	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.05
GAA:					
Galindo	76	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.25
GEF:					
Geefour	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Geefour, eroded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GFF:					
Geefour	53	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Corazones	21	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.15	Thickest layer	0.11
Ojinaga	13	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.09
		Bottom layer	0.08	Bottom layer	0.14
GMF:					
Geefour	49	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Melado	31	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GSA:					
Gemelo	60	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.09
Straddlebug	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
HOB:					
Holguin	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.10
HOD:					
Horsetrap	57	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.05	Thickest layer	0.03
Bofecillos	28	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.08
Rock outcrop	10	Not rated		Not rated	
KIB:					
Kinco	80	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.09
LGC:					
Lingua	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LIF:					
Lingua	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ohtwo	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MAE:					
Manzanillo	65	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.34	Thickest layer	0.09
Paisano	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MBE:					
Manzanillo	40	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.34	Thickest layer	0.06
Chilicotal	25	Fair		Fair	
		Bottom layer	0.37	Bottom layer	0.00
		Thickest layer	0.37	Thickest layer	0.05
Holguin	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.01
		Thickest layer	0.00	Thickest layer	0.10

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
MCA:					
Marfa	92	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.06
MDE:					
Mariscal	80	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Rock outcrop	15	Not rated		Not rated	
MOA:					
Martillo	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Butcherknife	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MPB:					
Melado	54	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pantera	38	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.33
		Bottom layer	0.00	Bottom layer	0.69
MUB:					
Murray	58	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.05
Marfa	21	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.06
Boracho	15	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.53	Thickest layer	0.00
MZA:					
Musquiz	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NLA:					
Nillo	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NPB:					
Nolam	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.06

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
Paisano	25	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.73	Thickest layer	0.08
PAC:					
Paisano	80	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.01
PAD:					
Paisano	80	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.01
PIB:					
Paisano	55	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.01
Musgrave	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PKD:					
Pantak	46	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.43	Thickest layer	0.02
Lingua	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PKE:					
Pantak	36	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.02
Lingua	24	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.03	Thickest layer	0.00
Rock outcrop	19	Not rated		Not rated	
PTA:					
Phantom	86	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PZB:					
Phantom	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Musquiz	39	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
QBE:					
Quadria	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
Nolam	30	Fair		Poor	
		Thickest layer	0.45	Bottom layer	0.00
		Bottom layer	0.45	Thickest layer	0.00
Musgrave	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RCE:					
Redford	52	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.04
		Bottom layer	0.00	Thickest layer	0.09
Corazones	32	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.11
		Bottom layer	0.15	Bottom layer	0.28
RCG:					
Redford	54	Fair		Fair	
		Thickest layer	0.05	Bottom layer	0.04
		Bottom layer	0.05	Thickest layer	0.09
Corazones	36	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.11
		Bottom layer	0.15	Bottom layer	0.28
RED:					
Redlight	45	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.05
		Bottom layer	0.03	Thickest layer	0.09
Terlingua	15	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.05
		Bottom layer	0.08	Thickest layer	0.09
Rock outcrop	24	Not rated		Not rated	
REE:					
Reduff	30	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.13	Thickest layer	0.00
Scotal	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Holguin	25	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.08
RIA:					
Riverwash	50	Not rated		Not rated	

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
Pantera	36	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.12
		Bottom layer	0.25	Thickest layer	0.27
RMB:					
Rockhouse	60	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.06
Medley	27	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SCB:					
Sanmoss	65	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Medley	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SDC:					
Sauceda	60	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Boludo	20	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
SEE:					
Sauceda	55	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Decoty	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.03
SHC:					
Scotal	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Holguin	35	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.08
SHE:					
Scotal	65	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.88	Thickest layer	0.00
Rock outcrop	15	Not rated		Not rated	

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
SIG:					
Scotal	40	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.10	Thickest layer	0.00
Ohtwo	30	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.03	Thickest layer	0.00
Rock outcrop	20	Not rated		Not rated	
SRA:					
Straddlebug	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
STE:					
Strawhouse	50	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.13	Thickest layer	0.03
Stillwell	35	Fair		Fair	
		Thickest layer	0.03	Bottom layer	0.05
		Bottom layer	0.58	Thickest layer	0.09
SUD:					
Studybutte	85	Fair		Fair	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.50	Thickest layer	0.04
SUE:					
Studybutte	60	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.53	Thickest layer	0.00
Rock outcrop	25	Not rated		Not rated	
SUG:					
Studybutte	60	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.53	Thickest layer	0.00
Rock outcrop	30	Not rated		Not rated	
TEA:					
Tenneco	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bodecker	15	Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.15	Thickest layer	0.09
TRE:					
Terlingua	70	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.08
Rock outcrop	25	Not rated		Not rated	

Table 25.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Gravel Source: Rating class and limiting features	Value	Sand Source: Rating class and limiting features	Value
TRG:					
Terlingua	65	Fair		Fair	
		Thickest layer	0.03	Bottom layer	0.04
		Bottom layer	0.23	Thickest layer	0.08
Rock outcrop	30	Not rated		Not rated	
VAA:					
Verhalen	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
VCA:					
Vicente	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lomapelona	29	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
Castolon	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
VOC:					
Volco	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pardo	45	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.00
W:					
Water	100	Not rated		Not rated	

Table 26.--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 0.01 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	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
ALB:							
Altar	45	Fair		Fair		Poor	
		Low content of organic matter	0.02	Dusty	0.91	Rock fragments	0.00
		Droughty	0.12			Hard to reclaim (rock fragments)	0.00
Bodecker	30	Poor		Fair		Poor	
		Droughty	0.00	Cobble content	0.06	Rock fragments	0.00
		Too sandy	0.00	Dusty	0.98	Too sandy	0.00
		Too alkaline	0.00			Hard to reclaim (rock fragments)	0.00
Riverwash	15	Not rated		Not rated		Not rated	
ANS:							
Area not surveyed	100	Not rated		Not rated		Not rated	
BAC:							
Baviza	75	Poor		Fair		Poor	
		Too sandy	0.00	Dusty	0.83	Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.45
		Droughty	0.03			Hard to reclaim (rock fragments)	0.99
Pantera	21	Poor		Fair		Poor	
		Too sandy	0.00	Dusty	0.83	Hard to reclaim (rock fragments)	0.00
		Wind erosion	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
BEB:							
Berrend	72	Fair		Fair		Good	
		Carbonate content	0.84	Low strength	0.78		
				Dusty	0.95		
				Shrink-swell	0.99		
Espy	17	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Carbonate content	0.00			Rock fragments	0.62
		Depth to cemented pan	0.00			Too sandy	0.75
BIC:							
Bissett	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Carbonate content	0.00
		Carbonate content	0.00	Dusty	0.75	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
BIE:							
Bissett----------	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Carbonate content	0.00
		Carbonate content	0.00	Slope	0.50	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.75	Depth to bedrock	0.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	70	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Carbonate content	0.00
		Carbonate content	0.00	Slope	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.75	Slope	0.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BLE:							
Blackgap----------	52	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Carbonate content	0.00
		Carbonate content	0.00	Cobble content	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.61	Depth to bedrock	0.00
Rock outcrop--------	45	Not rated		Not rated		Not rated	
BLG:							
Blackgap----------	75	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Carbonate content	0.00
		Carbonate content	0.00	Cobble content	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BNE:							
Bofecillos----------	47	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.88	Depth to bedrock	0.00
						Slope	0.00
Horsetrap----------	21	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Stones	0.32	Depth to bedrock	0.00
		Stone content	0.32	Dusty	0.88	Slope	0.00
Rock outcrop--------	17	Not rated		Not rated		Not rated	
BNG:							
Bofecillos----------	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
				Dusty	0.76	Slope	0.00
Rock outcrop--------	40	Not rated		Not rated		Not rated	

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
BOB:							
Boracho----------	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00	Dusty	0.97	Depth to cemented pan	0.00
		Carbonate content	0.68			Hard to reclaim (rock fragments)	0.00
Espy----------	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Carbonate content	0.00	Dusty	0.83	Rock fragments	0.00
		Depth to cemented pan	0.00			Hard to reclaim (rock fragments)	0.08
BOC:							
Borunda----------	60	Poor		Poor		Poor	
		Sodium content	0.00	Low strength	0.00	Sodium content	0.00
		Too clayey	0.00	Depth to bedrock	0.00	Salinity	0.00
		Carbonate content	0.01	Dusty	0.67	Too clayey	0.00
Borunda, gravelly---	20	Poor		Poor		Poor	
		Sodium content	0.00	Depth to bedrock	0.00	Sodium content	0.00
		Too clayey	0.00	Low strength	0.00	Salinity	0.00
		Low content of organic matter	0.08	Dusty	0.69	Too clayey	0.00
BRD:							
Brewster----------	75	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.79	Depth to bedrock	0.00
BRF:							
Brewster----------	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.50	Depth to bedrock	0.00
				Dusty	0.83	Slope	0.00
Rock outcrop--------	15	Not rated		Not rated		Not rated	
BRG:							
Brewster----------	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Stone content	0.18	Cobble content	0.00	Rock fragments	0.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BUD:							
Buckear----------	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.78	Depth to bedrock	0.00
Coyanosa----------	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.94	Depth to bedrock	0.00
		Low content of organic matter	0.88			Slope	0.63

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
CAA:							
Castolon	79	Fair		Poor		Fair	
		Low content of organic matter	0.50	Low strength	0.00	Too clayey	0.67
		Water erosion	0.68	Dusty	0.57		
				Shrink-swell	0.87		
CAG:							
Catto	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Too clayey	0.73	Dusty	0.78	Depth to bedrock	0.00
Buckear	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
				Dusty	0.78	Depth to bedrock	0.00
Rock outcrop	10	Not rated		Not rated		Not rated	
CIC:							
Chilicotal	80	Fair		Fair		Poor	
		Low content of organic matter	0.68	Dusty	0.78	Rock fragments	0.00
		Sodium content	0.78			Hard to reclaim (rock fragments)	0.00
		Carbonate content	0.92			Sodium content	0.78
CID:							
Chilicotal	80	Fair		Fair		Poor	
		Low content of organic matter	0.68	Dusty	0.78	Rock fragments	0.00
		Sodium content	0.78			Hard to reclaim (rock fragments)	0.00
		Carbonate content	0.92			Slope	0.63
CLC:							
Chilicotal	61	Fair		Fair		Poor	
		Low content of organic matter	0.18	Dusty	0.83	Hard to reclaim (rock fragments)	0.00
		Sodium content	0.22	Cobble content	0.88	Rock fragments	0.00
		Carbonate content	0.92			Sodium content	0.22
Paisano	32	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Carbonate content	0.00	Dusty	0.83	Depth to cemented pan	0.00
		Depth to cemented pan	0.00			Hard to reclaim (rock fragments)	0.00
CMC:							
Chilimol	45	Fair		Fair		Poor	
		Low content of organic matter	0.50	Dusty	0.82	Rock fragments	0.00
						Hard to reclaim (rock fragments)	0.00

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Boracho	32	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00			Depth to cemented pan	0.00
		Carbonate content	0.68			Hard to reclaim (rock fragments)	0.00
Berrend	13	Fair		Poor		Good	
		Carbonate content	0.97	Low strength	0.00		
				Dusty	0.87		
				Shrink-swell	0.96		
CND:							
Chinati	54	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00	Depth to bedrock	0.00	Depth to cemented pan	0.00
		Depth to bedrock	0.01	Dusty	0.84	Hard to reclaim (rock fragments)	0.00
Boracho	19	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00	Dusty	0.80	Depth to cemented pan	0.00
		Carbonate content	0.68	Cobble content	0.95	Hard to reclaim (rock fragments)	0.00
Berrend	12	Fair		Fair		Good	
		Low content of organic matter	0.88	Dusty	0.95		
		Carbonate content	0.97				
CNE:							
Chinati	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00	Depth to bedrock	0.00	Depth to cemented pan	0.00
		Depth to bedrock	0.46			Hard to reclaim (rock fragments)	0.00
Boracho	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00	Dusty	0.86	Depth to cemented pan	0.00
		Carbonate content	0.68			Hard to reclaim (rock fragments)	0.00
COC:							
Corazones	50	Fair		Fair		Poor	
		Droughty	0.05	Dusty	0.80	Rock fragments	0.00
		Low content of organic matter	0.50			Hard to reclaim (rock fragments)	0.00
		Carbonate content	0.80			Too sandy	0.87

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Ojinaga	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00	Dusty	0.79	Depth to cemented pan	0.00
		Carbonate content	0.08			Hard to reclaim (rock fragments)	0.00
COE:							
Corazones	61	Fair		Poor		Poor	
		Carbonate content	0.80	Slope	0.00	Rock fragments	0.00
		Low content of organic matter	0.88	Dusty	0.80	Hard to reclaim (rock fragments)	0.00
		Droughty	0.90			Slope	0.00
Ojinaga	26	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00	Slope	0.00	Depth to cemented pan	0.00
		Carbonate content	0.08	Dusty	0.67	Slope	0.00
CVC:							
Costavar	53	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Dusty	0.97	Rock fragments	0.00
Volco	19	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Cobble content	0.00	Rock fragments	0.00
		Cobble content	0.01	Dusty	0.83	Carbonate content	0.70
EEB:							
Espy	56	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Hard to reclaim (rock fragments)	0.00
		Depth to cemented pan	0.00			Depth to cemented pan	0.00
		Too sandy	0.78			Rock fragments	0.62
Eppenauer	39	Fair		Poor		Fair	
		Depth to bedrock	0.05	Depth to bedrock	0.00	Depth to bedrock	0.05
		Droughty	0.06	Dusty	0.99		
GAA:							
Galindo	76	Poor		Fair		Poor	
		Too clayey	0.00	Dusty	0.57	Too clayey	0.00
		Low content of organic matter	0.18	Shrink-swell	0.64	Sodium content	0.98
		Water erosion	0.68				
GEF:							
Geefour	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Salinity	0.00
		Salinity	0.00	Low strength	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Shrink-swell	0.13	Too clayey	0.00

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Geefour, eroded-----	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Salinity	0.00
		Salinity	0.00	Low strength	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Shrink-swell	0.13	Too clayey	0.00
GFF:							
Geefour----------	53	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Salinity	0.00	Low strength	0.00	Too clayey	0.00
		Depth to bedrock	0.00	Shrink-swell	0.13	Salinity	0.00
Corazones----------	21	Fair		Fair		Poor	
		Low content of organic matter	0.50	Cobble content	0.03	Rock fragments	0.00
		Carbonate content	0.80	Slope	0.50	Hard to reclaim (rock fragments)	0.00
		Droughty	0.95	Dusty	0.80	Slope	0.00
Ojinaga----------	13	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00	Dusty	0.79	Depth to cemented pan	0.00
		Carbonate content	0.08			Hard to reclaim (rock fragments)	0.00
GMF:							
Geefour----------	49	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Droughty	0.00	Low strength	0.00	Sodium content	0.00
		Sodium content	0.00	Shrink-swell	0.13	Salinity	0.00
Melado----------	31	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Sodium content	0.00	Shrink-swell	0.13	Sodium content	0.00
		Salinity	0.00	Dusty	0.57	Salinity	0.00
GSA:							
Gemelo----------	60	Poor		Fair		Fair	
		Too alkaline	0.00	Dusty	0.90	Rock fragments	0.13
		Low content of organic matter	0.32			Hard to reclaim (rock fragments)	0.27
		Sodium content	0.61			Sodium content	0.61
Straddlebug---------	25	Poor		Fair		Poor	
		Sodium content	0.00	Dusty	0.69	Sodium content	0.00
		Too alkaline	0.00	Shrink-swell	0.99	Too clayey	0.67
		Low content of organic matter	0.50				
HOB:							
Holguin----------	85	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.95	Depth to bedrock	0.00
		Too sandy	0.99			Too sandy	0.99
HOD:							
Horsetrap----------	57	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.86	Depth to bedrock	0.00

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Bofecillos----------	28	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.91	Depth to bedrock	0.00
Rock outcrop--------	10	Not rated		Not rated		Not rated	
KIB:							
Kinco----------	80	Fair		Fair		Fair	
		Carbonate content	0.68	Dusty	0.92	Rock fragments	0.05
						Hard to reclaim (rock fragments)	0.92
LGC:							
Lingua----------	70	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	High gypsum content	0.00	Depth to bedrock	0.00
				Dusty	0.81		
LIF:							
Lingua----------	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	High gypsum content	0.00	Slope	0.00
				Slope	0.00	Depth to bedrock	0.00
Ohtwo----------	30	Good		Poor		Poor	
				Slope	0.00	Rock fragments	0.00
				Dusty	0.73	Slope	0.00
				Shrink-swell	0.94	Hard to reclaim (rock fragments)	0.00
MAE:							
Manzanillo----------	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Cobble content	0.89	Rock fragments	0.00
Paisano----------	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Carbonate content	0.00	Dusty	0.78	Carbonate content	0.00
		Depth to cemented pan	0.00			Rock fragments	0.00
MBE:							
Manzanillo----------	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Depth to bedrock	0.00	Cobble content	0.79	Depth to bedrock	0.00
Chilicotal----------	25	Fair		Fair		Poor	
		Low content of organic matter	0.18	Cobble content	0.72	Rock fragments	0.00
		Droughty	0.72	Dusty	0.88	Hard to reclaim (rock fragments)	0.00
		Sodium content	0.78	Slope	0.98	Slope	0.00

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Holguin----------	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.94	Depth to bedrock	0.00
				Slope	0.98	Slope	0.00
MCA:							
Marfa----------	92	Fair		Poor		Fair	
		Too clayey	0.07	Low strength	0.00	Too clayey	0.06
				Dusty	0.78		
				Shrink-swell	0.97		
MDE:							
Mariscal----------	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Carbonate content	0.00
		Carbonate content	0.00	Cobble content	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.50	Depth to bedrock	0.00
Rock outcrop--------	15	Not rated		Not rated		Not rated	
MOA:							
Martillo----------	60	Poor		Fair		Poor	
		Sodium content	0.00	Low strength	0.22	Sodium content	0.00
		Too clayey	0.03	Dusty	0.66	Too clayey	0.02
		Low content of organic matter	0.13	Shrink-swell	0.71	Salinity	0.96
Butcherknife--------	25	Poor		Poor		Poor	
		Sodium content	0.00	Low strength	0.00	Sodium content	0.00
		Too clayey	0.00	Depth to bedrock	0.01	Too clayey	0.00
		Carbonate content	0.32	Shrink-swell	0.13	Salinity	0.32
MPB:							
Melado----------	54	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Sodium content	0.00	Shrink-swell	0.32	Sodium content	0.00
		Salinity	0.00	Dusty	0.57	Salinity	0.00
Pantera----------	38	Poor		Fair		Poor	
		Droughty	0.00	Dusty	0.75	Rock fragments	0.00
		Too sandy	0.79			Hard to reclaim (rock fragments)	0.00
		Low content of organic matter	0.88			Too sandy	0.79
MUB:							
Murray----------	58	Fair		Fair		Fair	
		Low content of organic matter	0.18	Dusty	0.93	Carbonate content	0.86
		Carbonate content	0.68				
Marfa----------	21	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
				Dusty	0.77		
				Shrink-swell	0.97		

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Boracho----------	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Depth to cemented pan	0.00	Dusty	0.84	Depth to cemented pan	0.00
		Carbonate content	0.68			Hard to reclaim (rock fragments)	0.00
MZA:							
Musquiz----------	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.88	Shrink-swell	0.57	Rock fragments	0.47
		Carbonate content	0.97	Dusty	0.77		
NLA:							
Nillo----------	90	Poor		Poor		Fair	
		Too alkaline	0.00	Low strength	0.00	Sodium content	0.90
		Water erosion	0.68	Dusty	0.70		
		Low content of organic matter	0.88	Shrink-swell	0.87		
NPB:							
Nolam----------	55	Poor		Fair		Poor	
		Too alkaline	0.00	Dusty	0.87	Rock fragments	0.00
		Low content of organic matter	0.50	Shrink-swell	0.99	Hard to reclaim (rock fragments)	0.01
		Carbonate content	0.92			Carbonate content	0.99
Paisano----------	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Carbonate content	0.00	Dusty	0.91	Depth to cemented pan	0.00
		Depth to cemented pan	0.00			Hard to reclaim (rock fragments)	0.00
PAC:							
Paisano----------	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Carbonate content	0.00	High gypsum content	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Dusty	0.84	Carbonate content	0.00
PAD:							
Paisano----------	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Carbonate content	0.00	High gypsum content	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Dusty	0.84	Carbonate content	0.00

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
PIB:							
Paisano----------	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Rock fragments	0.00
		Carbonate content	0.00	High gypsum content	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Dusty	0.84	Carbonate content	0.00
Musgrave----------	35	Poor		Poor		Poor	
		Depth to bedrock	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Sodium content	0.00	Low strength	0.00	Sodium content	0.00
		Low content of organic matter	0.01	Dusty	0.71	Too clayey	0.09
PKD:							
Pantak----------	46	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	High gypsum content	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.50	Dusty	0.84	Too clayey	0.70
Lingua----------	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.81	Depth to bedrock	0.00
		Too clayey	0.92	Cobble content	0.99	Too clayey	0.76
PKE:							
Pantak----------	36	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.82	Depth to bedrock	0.00
		Low content of organic matter	0.50	Dusty	0.84	Slope	0.00
Lingua----------	24	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	High gypsum content	0.00	Depth to bedrock	0.00
		Stone content	0.18	Cobble content	0.13	Slope	0.00
Rock outcrop--------	19	Not rated		Not rated		Not rated	
PTA:							
Phantom----------	86	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.88	Shrink-swell	0.13		
				Dusty	0.73		
PZB:							
Phantom----------	45	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.88	Shrink-swell	0.13		
				Dusty	0.70		

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Musquiz----------	39	Fair		Fair		Fair	
		Low content of organic matter	0.88	Low strength	0.78	Rock fragments	0.48
		Carbonate content	0.92	Dusty	0.79	Too clayey	0.81
		Too clayey	0.97				
QBE:							
Quadria----------	40	Poor		Fair		Poor	
		Sodium content	0.00	Shrink-swell	0.29	Sodium content	0.00
		Too alkaline	0.00	Dusty	0.71	Salinity	0.00
		Too clayey	0.15	Low strength	0.78	Too clayey	0.11
Nolam----------	30	Fair		Fair		Poor	
		Carbonate content	0.32	Dusty	0.71	Rock fragments	0.00
		Low content of organic matter	0.50	Cobble content	0.73	Hard to reclaim (rock fragments)	0.00
		Droughty	0.77	Shrink-swell	0.86	Carbonate content	0.85
Musgrave----------	25	Poor		Poor		Poor	
		Depth to bedrock	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Sodium content	0.00	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.01	Dusty	0.71	Sodium content	0.00
RCE:							
Redford----------	52	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.50	Depth to bedrock	0.00
		Low content of organic matter	0.60	Dusty	0.79	Slope	0.00
Corazones----------	32	Fair		Fair		Poor	
		Carbonate content	0.80	Slope	0.50	Rock fragments	0.00
		Low content of organic matter	0.88	Dusty	0.80	Hard to reclaim (rock fragments)	0.00
		Droughty	0.92			Slope	0.00
RCG:							
Redford----------	54	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.60	Dusty	0.79	Depth to bedrock	0.00
Corazones----------	36	Fair		Poor		Poor	
		Carbonate content	0.80	Slope	0.00	Rock fragments	0.00
		Low content of organic matter	0.88	Dusty	0.80	Slope	0.00
		Droughty	0.93			Hard to reclaim (rock fragments)	0.00
RED:							
Redlight----------	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Carbonate content	0.08	Dusty	0.79	Depth to bedrock	0.00
Terlingua----------	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.79	Depth to bedrock	0.00
						Slope	0.00

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Rock outcrop--------	24	Not rated		Not rated		Not rated	
REE:							
Reduff----------	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Stones	0.06	Depth to bedrock	0.00
		Stone content	0.06	Dusty	0.75	Slope	0.00
Scotal----------	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	High gypsum content	0.00	Depth to bedrock	0.00
				Dusty	0.78	Slope	0.00
Holguin----------	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Cobble content	0.73	Depth to bedrock	0.00
				Dusty	0.92		
RIA:							
Riverwash----------	50	Not rated		Not rated		Not rated	
Pantera----------	36	Poor		Fair		Poor	
		Droughty	0.00	Dusty	0.83	Rock fragments	0.00
		Too alkaline	0.00			Hard to reclaim (rock fragments)	0.00
		Low content of organic matter	0.08			Too sandy	0.17
RMB:							
Rockhouse----------	60	Fair		Fair		Poor	
		Low content of organic matter	0.88	Dusty	0.90	Hard to reclaim (rock fragments)	0.00
						Rock fragments	0.00
Medley----------	27	Fair		Fair		Fair	
		Low content of organic matter	0.88	Dusty	0.97	Rock fragments	0.42
SCB:							
Sanmoss----------	65	Good		Fair		Poor	
				Dusty	0.86	Rock fragments	0.00
						Hard to reclaim (rock fragments)	0.00
Medley----------	25	Fair		Poor		Fair	
		Low content of organic matter	0.88	Low strength	0.00	Rock fragments	0.09
				Dusty	0.94		
				Shrink-swell	0.98		
SDC:							
Sauceda----------	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	High gypsum content	0.00	Depth to bedrock	0.00
		Cobble content	0.96	Cobble content	0.21		

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Boluvo	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Cobble content	0.43	Rock fragments	0.00
SEE:							
Sauceda	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	High gypsum content	0.00	Depth to bedrock	0.00
		Cobble content	0.96	Cobble content	0.21	Slope	0.84
Decoty	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Cobble content	0.70	Depth to bedrock	0.00
				Dusty	0.85	Slope	0.84
SHC:							
Scotal	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	High gypsum content	0.00	Depth to bedrock	0.00
				Dusty	0.78		
Holguin	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Cobble content	0.73	Depth to bedrock	0.00
				Dusty	0.92		
SHE:							
Scotal	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.77	Depth to bedrock	0.00
		Low content of organic matter	0.50	Cobble content	0.99	Slope	0.63
Rock outcrop	15	Not rated		Not rated		Not rated	
SIG:							
Scotal	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	High gypsum content	0.00	Slope	0.00
				Slope	0.00	Depth to bedrock	0.00
Ohtwo	30	Good		Poor		Poor	
				Slope	0.00	Rock fragments	0.00
				Dusty	0.73	Slope	0.00
						Hard to reclaim (rock fragments)	0.00
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
SRA:							
Straddlebug---------	80	Poor		Fair		Poor	
		Sodium content	0.00	Dusty	0.69	Sodium content	0.00
		Too alkaline	0.00	Shrink-swell	0.99	Too clayey	0.67
		Low content of organic matter	0.50				
STE:							
Strawhouse----------	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Carbonate content	0.00
		Carbonate content	0.00	Dusty	0.74	Hard to reclaim (rock fragments)	0.00
		Depth to cemented pan	0.00			Rock fragments	0.00
Stillwell----------	35	Poor		Fair		Poor	
		Carbonate content	0.00	Dusty	0.79	Carbonate content	0.00
		Droughty	0.06			Rock fragments	0.00
		Low content of organic matter	0.18			Hard to reclaim (rock fragments)	0.00
SUD:							
Studybutte----------	85	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.74	Depth to bedrock	0.00
				Slope	0.82	Slope	0.00
SUE:							
Studybutte----------	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Dusty	0.68	Depth to bedrock	0.00
				Slope	0.82	Slope	0.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
SUG:							
Studybutte----------	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
				Dusty	0.68	Depth to bedrock	0.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
TEA:							
Tenneco----------	70	Fair		Fair		Fair	
		Low content of organic matter	0.88	Dusty	0.65	Hard to reclaim (rock fragments)	0.92
		Water erosion	0.90	Low strength	0.78	Rock fragments	0.98
				Shrink-swell	0.95		
Bodecker----------	15	Fair		Fair		Poor	
		Low content of organic matter	0.88	Dusty	0.86	Rock fragments	0.00
		Water erosion	0.99			Hard to reclaim (rock fragments)	0.21
		Too sandy	0.99			Too sandy	0.99

Table 26.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
TRE:							
Terlingua----------	70	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Dusty	0.78	Rock fragments	0.00
				Slope	0.98	Slope	0.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
TRG:							
Terlingua----------	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.76	Dusty	0.78	Slope	0.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
VAA:							
Verhalen----------	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.13	Salinity	0.88
				Dusty	0.64		
VCA:							
Vicente----------	30	Fair		Fair		Good	
		Water erosion	0.37	Dusty	0.64		
		Low content of organic matter	0.50				
Lomapelona----------	29	Fair		Fair		Good	
		Water erosion	0.37	Dusty	0.72		
		Low content of organic matter	0.60				
Castolon----------	25	Fair		Poor		Fair	
		Low content of organic matter	0.50	Low strength	0.00	Too clayey	0.67
		Water erosion	0.68	Dusty	0.57		
				Shrink-swell	0.87		
VOC:							
Volco----------	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Dusty	0.83	Rock fragments	0.00
		Carbonate content	0.46			Carbonate content	0.80
Pardo----------	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Dusty	0.80	Rock fragments	0.00
W:							
Water----------	100	Not rated		Not rated		Not rated	

Table 27.--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		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
ALB:							
Altar	45	Very limited Seepage	 1.00	Very limited Seepage Dusty	 1.00 0.06	Very limited Depth to water	 1.00
Bodecker	30	Very limited Seepage	 1.00	Very limited Seepage Large stones	 1.00 0.23	Very limited Depth to water	 1.00
Riverwash	15	Not rated		Not rated		Not rated	
ANS:							
Area not surveyed	100	Not rated		Not rated		Not rated	
BAC:							
Baviza	75	Very limited Seepage Slope	 1.00 0.08	Very limited Seepage	 1.00	Very limited Depth to water	 1.00
Pantera	21	Very limited Seepage	 1.00	Very limited Seepage	 1.00	Very limited Depth to water	 1.00
BEB:							
Berrend	72	Very limited Seepage	 1.00	Somewhat limited Piping Dusty	 0.29 0.16	Very limited Depth to water	 1.00
Espy	17	Very limited Depth to cemented pan Seepage	 1.00 0.70	Very limited Thin layer	 1.00	Very limited Depth to water	 1.00
BIC:							
Bissett	65	Very limited Depth to bedrock Slope	 1.00 0.08	Very limited Thin layer Dusty	 1.00 0.32	Very limited Depth to water	 1.00
Rock outcrop	20	Not rated		Not rated		Not rated	
BIE:							
Bissett	60	Very limited Depth to bedrock Slope	 1.00 1.00	Very limited Thin layer Dusty	 1.00 0.32	Very limited Depth to water	 1.00
Rock outcrop	25	Not rated		Not rated		Not rated	
BIG:							
Bissett	70	Very limited Slope Depth to bedrock	 1.00 1.00	Very limited Thin layer Dusty	 1.00 0.32	Very limited Depth to water	 1.00
Rock outcrop	25	Not rated		Not rated		Not rated	

Table 27.--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
BLE:							
Blackgap----------	52	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.41		
		Seepage	0.01	Large stones	0.37		
Rock outcrop--------	45	Not rated		Not rated		Not rated	
BLG:							
Blackgap----------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.41		
		Seepage	0.01	Large stones	0.37		
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BNE:							
Bofecillos----------	47	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.10		
Horsetrap----------	21	Very limited		Very limited		Very limited	
		Slope	1.00	Seepage	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Thin layer	1.00		
				Dusty	0.10		
Rock outcrop--------	17	Not rated		Not rated		Not rated	
BNG:							
Bofecillos----------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.31		
Rock outcrop--------	40	Not rated		Not rated		Not rated	
BOB:							
Boracho----------	60	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	1.00	Thin layer	1.00		
				Dusty	0.12		
Espy----------	20	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	1.00	Dusty	0.32		
BOC:							
Borunda----------	60	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.48	Hard to pack	1.00	Depth to water	1.00
		Slope	0.08	Thin layer	0.91		
				Dusty	0.50		
				Salinity	0.10		
Borunda, gravelly---	20	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.48	Piping	1.00	Depth to water	1.00
		Slope	0.08	Thin layer	0.87		
				Salinity	0.50		
				Dusty	0.43		

Table 27.--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
BRD:							
Brewster	75	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.38		
BRF:							
Brewster	65	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.32		
Rock outcrop	15	Not rated		Not rated		Not rated	
BRG:							
Brewster	60	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Large stones	0.99		
				Dusty	0.38		
Rock outcrop	25	Not rated		Not rated		Not rated	
BUD:							
Buckear	55	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	0.92	Dusty	0.27		
Coyanosa	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.01		
CAA:							
Castolon	79	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Dusty	0.50	Depth to water	1.00
				Piping	0.02		
CAG:							
Catto	50	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.27		
Buckear	35	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	0.75	Dusty	0.27		
Rock outcrop	10	Not rated		Not rated		Not rated	
CIC:							
Chilicotal	80	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Seepage	1.00	Depth to water	1.00
				Piping	0.78		
				Dusty	0.27		
CID:							
Chilicotal	80	Very limited		Very limited		Very limited	
		Slope	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	0.70	Piping	0.78		
				Dusty	0.27		

Table 27.--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
CLC:							
Chilicotal----------	61	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.78	Depth to water	1.00
				Seepage	0.18		
				Dusty	0.18		
Paisano----------	32	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	1.00	Thin layer	1.00		
				Dusty	0.19		
CMC:							
Chilimol----------	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Seepage	0.40	Depth to water	1.00
		Slope	0.32	Dusty	0.34		
Boracho----------	32	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	1.00	Thin layer	1.00		
		Slope	0.32	Dusty	0.04		
Berrend----------	13	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.33	Depth to water	1.00
		Slope	0.32	Dusty	0.27		
CND:							
Chinati----------	54	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	0.99	Dusty	0.30		
		Slope	0.68				
Boracho----------	19	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	1.00	Dusty	0.36		
		Slope	1.00	Seepage	0.20		
				Large stones	0.01		
Berrend----------	12	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Dusty	0.16	Depth to water	1.00
		Slope	0.32				
CNE:							
Chinati----------	50	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.07		
		Depth to bedrock	0.88				
Boracho----------	30	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	1.00	Dusty	0.28		
		Slope	1.00				

Table 27.--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
COC:							
Corazones----------	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	0.32	Dusty	0.02		
Ojinaga----------	40	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	1.00	Thin layer	1.00		
		Slope	0.32	Piping	1.00		
				Dusty	0.04		
				Salinity	0.03		
COE:							
Corazones----------	61	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.02		
Ojinaga----------	26	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	1.00	Dusty	0.28		
		Slope	1.00	Seepage	0.20		
				Piping	0.03		
CVC:							
Costavar----------	53	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to water	1.00
		Slope	0.08	Thin layer	1.00		
				Dusty	0.13		
Volco----------	19	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.08	Large stones	0.99		
				Dusty	0.31		
EEB:							
Espy----------	56	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	0.70				
Eppenauer----------	39	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.99	Depth to water	1.00
		Depth to bedrock	0.34	Dusty	0.09		
GAA:							
Galindo----------	76	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
				Piping	0.90		
				Dusty	0.50		
GEF:							
Geefour----------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Salinity	1.00	Depth to water	1.00
		Depth to bedrock	0.92	Hard to pack	1.00		
				Dusty	0.49		

Table 27.--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
Geefour, eroded-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Salinity	1.00	Depth to water	1.00
		Depth to bedrock	0.92	Hard to pack	1.00		
				Dusty	0.50		
GFF:							
Geefour----------	53	Very limited		Very limited		Very limited	
		Slope	1.00	Salinity	1.00	Depth to water	1.00
		Depth to bedrock	0.79	Hard to pack	1.00		
				Dusty	0.44		
Corazones----------	21	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Large stones	0.22		
				Dusty	0.02		
Ojinaga----------	13	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	1.00	Thin layer	1.00		
		Slope	1.00	Piping	1.00		
				Dusty	0.03		
				Salinity	0.03		
GMF:							
Geefour----------	49	Very limited		Very limited		Very limited	
		Slope	1.00	Hard to pack	1.00	Depth to water	1.00
		Depth to bedrock	0.55	Salinity	0.50		
				Dusty	0.50		
Melado----------	31	Very limited		Very limited		Very limited	
		Slope	1.00	Hard to pack	1.00	Depth to water	1.00
				Salinity	1.00		
				Dusty	0.50		
GSA:							
Gemelo----------	60	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
				Seepage	0.54		
				Dusty	0.08		
Straddlebug---------	25	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
				Dusty	0.41		
HOB:							
Holguin----------	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.32				
HOD:							
Horsetrap----------	57	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Seepage	0.50		
				Dusty	0.14		
Bofecillos----------	28	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.06		

Table 27.--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
Rock outcrop--------	10	Not rated		Not rated		Not rated	
KIB:							
Kinco----------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.07	Depth to water	1.00
				Dusty	0.04		
LGC:							
Lingua----------	70	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.08	Dusty	0.22		
LIF:							
Lingua----------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.22		
Ohtwo----------	30	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Dusty	0.36	Depth to water	1.00
		Seepage	0.70				
MAE:							
Manzanillo----------	65	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.02		
		Slope	1.00				
Paisano----------	30	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	1.00	Dusty	0.26		
		Slope	1.00				
MBE:							
Manzanillo----------	40	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Thin layer	1.00		
		Slope	1.00	Dusty	0.09		
Chilicotal----------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	0.70	Piping	0.78		
				Dusty	0.11		
Holguin----------	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.01		
MCA:							
Marfa----------	92	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Dusty	0.40	Depth to water	1.00
				Piping	0.05		

Table 27.--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
MDE:							
Mariscal----------	80	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Large stones	0.68		
				Dusty	0.27		
Rock outcrop--------	15	Not rated		Not rated		Not rated	
MOA:							
Martillo----------	60	Somewhat limited		Very limited		Very limited	
		Seepage	0.03	Piping	1.00	Depth to water	1.00
				Dusty	0.46		
Butcherknife--------	25	Somewhat limited		Very limited		Very limited	
		Seepage	0.03	Hard to pack	1.00	Depth to water	1.00
		Depth to bedrock	0.01	Salinity	0.50		
				Dusty	0.49		
				Thin layer	0.42		
MPB:							
Melado----------	54	Somewhat limited		Very limited		Very limited	
		Seepage	0.03	Salinity	1.00	Depth to water	1.00
				Hard to pack	1.00		
				Dusty	0.50		
Pantera----------	38	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
				Dusty	0.18		
				Piping	0.05		
MUB:							
Murray----------	58	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Dusty	0.19	Depth to water	1.00
Marfa----------	21	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Dusty	0.41	Depth to water	1.00
				Piping	0.01		
Boracho----------	15	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	1.00	Dusty	0.31		
MZA:							
Musquiz----------	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Dusty	0.41	Depth to water	1.00
NLA:							
Nillo----------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
				Dusty	0.40		
NPB:							
Nolam----------	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.85	Depth to water	1.00
				Dusty	0.12		

Table 27.--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
Paisano----------	25	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	1.00	Thin layer	1.00		
				Dusty	0.07		
PAC:							
Paisano----------	80	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	1.00	Thin layer	1.00		
				Dusty	0.18		
PAD:							
Paisano----------	80	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	1.00	Thin layer	1.00		
		Slope	1.00	Dusty	0.18		
PIB:							
Paisano----------	55	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	1.00	Thin layer	1.00		
				Dusty	0.18		
Musgrave----------	35	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.54	Piping	1.00	Depth to water	1.00
		Slope	0.08	Dusty	0.39		
PKD:							
Pantak----------	46	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.92	Dusty	0.17		
Lingua----------	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.08	Dusty	0.22		
PKE:							
Pantak----------	36	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.17		
Lingua----------	24	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Large stones	0.80		
				Dusty	0.29		
Rock outcrop--------	19	Not rated		Not rated		Not rated	
PTA:							
Phantom----------	86	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.62	Depth to water	1.00
				Dusty	0.46		

Table 27.--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
PZB:							
Phantom----------	45	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.96	Depth to water	1.00
				Dusty	0.50		
Musquiz----------	39	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Dusty	0.37	Depth to water	1.00
				Piping	0.03		
QBE:							
Quadria----------	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
				Dusty	0.38		
				Salinity	0.21		
Nolam----------	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.92	Depth to water	1.00
				Dusty	0.38		
Musgrave----------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Depth to bedrock	0.54	Dusty	0.39		
RCE:							
Redford----------	52	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Seepage	0.90		
				Dusty	0.04		
Corazones----------	32	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.02		
RCG:							
Redford----------	54	Very limited		Very limited		Very limited	
		Slope	1.00	Seepage	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Thin layer	1.00		
				Dusty	0.04		
Corazones----------	36	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.02		
RED:							
Redlight----------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Seepage	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Thin layer	1.00		
				Dusty	0.03		
Terlingua----------	15	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.04		
Rock outcrop--------	24	Not rated		Not rated		Not rated	

Table 27.--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
REE:							
Reduff	30	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Seepage	0.90		
				Dusty	0.32		
Scotal	30	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.27		
Holguin	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to water	1.00
		Slope	0.08	Thin layer	1.00		
				Dusty	0.05		
RIA:							
Riverwash	50	Not rated		Not rated		Not rated	
Pantera	36	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
RMB:							
Rockhouse	60	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.89	Depth to water	1.00
				Dusty	0.23		
Medley	27	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Dusty	0.13	Depth to water	1.00
SCB:							
Sanmoss	65	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.38	Depth to water	1.00
				Dusty	0.28		
Medley	25	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Dusty	0.17	Depth to water	1.00
SDC:							
Sauceda	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.08	Dusty	0.27		
				Large stones	0.04		
Boludo	20	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.36		
		Slope	0.08	Large stones	0.01		
SEE:							
Sauceda	55	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.27		
				Large stones	0.04		
Decoty	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Seepage	0.90		
				Dusty	0.15		

Table 27.--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
SHC:							
Scotal----------	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.32	Dusty	0.27		
Holguin----------	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to water	1.00
		Slope	0.08	Thin layer	1.00		
				Dusty	0.05		
SHE:							
Scotal----------	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.28		
Rock outcrop--------	15	Not rated		Not rated		Not rated	
SIG:							
Scotal----------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.27		
Ohtwo----------	30	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Dusty	0.36	Depth to water	1.00
		Seepage	0.70				
Rock outcrop--------	20	Not rated		Not rated		Not rated	
SRA:							
Straddlebug---------	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
				Dusty	0.41		
STE:							
Strawhouse----------	50	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	0.70	Dusty	0.14		
		Slope	0.32				
Stillwell----------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	0.70	Piping	1.00		
				Dusty	0.03		
SUD:							
Studybutte----------	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Thin layer	1.00		
				Dusty	0.14		
SUE:							
Studybutte----------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.26		
Rock outcrop--------	25	Not rated		Not rated		Not rated	

Table 27.--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
SUG:							
Studybutte----------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.26		
Rock outcrop--------	30	Not rated		Not rated		Not rated	
TEA:							
Tenneco----------	70	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Dusty	0.49	Depth to water	1.00
				Piping	0.01		
Bodecker----------	15	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.71	Depth to water	1.00
				Dusty	0.13		
TRE:							
Terlingua----------	70	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Dusty	0.05		
Rock outcrop--------	25	Not rated		Not rated		Not rated	
TRG:							
Terlingua----------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Seepage	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Thin layer	1.00		
				Dusty	0.05		
Rock outcrop--------	30	Not rated		Not rated		Not rated	
VAA:							
Verhalen----------	80	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.72	Depth to water	1.00
				Dusty	0.50		
VCA:							
Vicente----------	30	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
				Dusty	0.35		
Lomapelona----------	29	Somewhat limited		Very limited		Very limited	
		Seepage	0.03	Piping	1.00	Depth to water	1.00
				Dusty	0.18		
Castolon----------	25	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Dusty	0.50	Depth to water	1.00
				Piping	0.02		
VOC:							
Volco----------	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.08	Seepage	0.90		
				Dusty	0.31		

Table 27.--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
Pardo----------	45	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Dusty	0.36		
		Slope	0.08	Seepage	0.20		
W:							
Water----------	100	Not rated		Not rated		Not rated	

Table 28.--Engineering Index 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	
ALB:												
Altar----------	0-10	*Gravelly sandy loam	*SC, GP	*A-2-6, A-1-a, A-2-4	0	0	22-78	12-76	8-64	4-37	21-37	6-17
	10-26	*Extremely gravelly sandy loam, Very gravelly sandy loam	*GP-GC, GC	*A-2-6, A-2-4	0-5	0-10	18-54	14-52	10-46	5-26	23-40	7-21
	26-80	*Extremely gravelly fine sandy loam, Extremely gravelly sandy loam, very gravelly sandy loam, extremely gravelly coarse sandy loam, very gravelly coarse sandy loam, very gravelly loamy sand, extremely gravelly loamy sand	*GP-GC, GW, GC	*A-2-4, A-1-a, A-2-6	0-5	0-15	12-55	8-53	7-53	3-29	20-40	6-21
Bodecker--------	0-5	*Very gravelly loamy sand	*GP-GC, SC, GP	*A-2-4, A-1-a	0	8-35	24-82	20-81	15-69	2-20	0-32	NP-10
	5-30	*Extremely cobbly coarse sand	*GP, SP-SC	*A-1-a, A-1-b	1-10	20-62	13-73	9-71	4-38	1-12	0-24	NP-6
	30-80	*Extremely gravelly coarse sand	*GP, GW, SW-SC	*A-1-a, A-1-b	0-20	13-41	12-62	8-61	4-32	1-10	0-24	NP-6
Riverwash-------	---	---	---	---	---	---	---	---	---	---	---	---
ANS:												
Area not Surveyed-------	---	---	---	---	---	---	---	---	---	---	---	---
BAC:												
Baviza----------	0-3	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0-4	84-100	65-100	59-100	20-40	0-22	NP-4
	3-29	*Sand, Coarse sand, gravelly sand, gravelly coarse sand	*SP-SM, SC-SM	*A-2-4, A-1-b	0	0-4	84-100	66-100	49-81	6-15	0-22	NP-4
	29-80	*Gravelly sand, Sand, gravelly coarse sand	*SP-SM, SM	*A-2-4, A-1-b	0	0-5	85-98	55-97	42-77	5-13	0-19	NP-2

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Pantera---------	0-2	*Very gravelly coarse sand	*GP-GM, SM, GP	*A-1-b, A-1-a	0-5	8-17	33-77	30-75	14-38	4-13	0-19	NP-2
	2-80	*Very gravelly coarse sand, Extremely gravelly coarse sand	*GP, GP-GM	*A-1-a,	0-5	0-22	19-51	16-49	7-23	1-6	0-18	NP-2
BEB:												
Berrend---------	0-2	*Sandy clay loam	*CL, SC	*A-6, A-2-4	0	0	77-100	77-100	62-91	35-55	28-45	10-17
	2-19	*Sandy clay loam, Loam	*CL, SC	*A-6, A-2-4, A-7-6	0	0	80-100	77-100	58-94	30-59	28-51	10-25
	19-38	*Clay loam, Loam, sandy loam	*CL, SC	*A-6, A-4, A-7-6	0	0	79-100	77-100	56-93	37-68	28-49	10-25
	38-60	*Loam	*CL, SC	*A-6, A-2-4	0	0	81-100	62-100	48-91	32-66	26-40	9-19
	60-80	*Fine sandy loam	*SC, SC-SM	*A-4, A-6, A-2-4	0	0	80-100	59-100	52-97	21-44	21-32	6-13
Espy----------	0-4	*Fine sandy loam	*SC-SM, SC, SM	*A-2-4, A-6, A-1-b	0-1	0-8	78-94	57-94	50-93	18-40	20-34	3-11
	4-12	*Fine sandy loam	*SC-SM, SC, SM	*A-2-4, A-6, A-1-b	0-1	0-8	82-94	48-94	42-94	16-44	20-37	3-13
	12-18	*Cemented material	---	---	---	---	---	---	---	---	---	---
	18-80	*Loam	*CL, SC	*A-6, A-2-4	0-1	0-8	83-95	50-95	42-86	30-62	23-31	8-13
BIC:												
Bissett---------	0-2	*Very gravelly loam	*GM, GC	*A-2-7, A-2-6, A-7-5	0-5	0-17	35-65	32-64	26-63	19-49	29-54	12-24
	2-9	*Very gravelly loam, Very gravelly clay loam, gravelly loam	*GM, GC	*A-2-7, A-2-6, A-7-5	0-5	0-17	35-65	32-64	26-63	19-49	29-54	12-24
	9-19	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
BIE:												
Bissett---------	0-2	*Very gravelly loam	*GM, GC	*A-2-7, A-2-6, A-7-5	0-5	0-17	35-65	32-64	26-63	19-49	29-54	12-24
	2-9	*Very gravelly loam, Very gravelly clay loam, gravelly loam	*GM, GC	*A-2-7, A-2-6, A-7-5	0-5	0-17	35-65	32-64	26-63	19-49	29-54	12-24
	9-19	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BIG:												
Bissett---------	0-2	*Very gravelly loam	*GM, GC	*A-2-7, A-2-6, A-7-5	0-5	0-17	35-65	32-64	26-63	19-49	29-54	12-24
	2-9	*Very gravelly loam, Very gravelly clay loam, gravelly loam	*GM, GC	*A-2-7, A-2-6, A-7-5	0-5	0-17	35-65	32-64	26-63	19-49	29-54	12-24
	9-19	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
BLE:												
Blackgap--------	0-4	*Very gravelly silt loam	*GC-GM, GC	*A-2-4, A-6, A-1-a	0-1	0-22	23-54	20-52	18-52	14-45	24-40	4-18
	4-9	*Extremely cobbly silt loam, Very gravelly loam, very cobbly silt loam	*GC, CL	*A-6, A-2-4, A-2-6	0-1	47-54	31-100	28-100	25-98	21-83	28-40	10-19
	9-20	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
BLG:												
Blackgap--------	0-4	*Very gravelly silt loam	*GC-GM, GC	*A-2-4, A-6, A-1-a	0-1	0-22	23-54	20-52	18-52	14-45	24-40	4-18
	4-9	*Extremely cobbly silt loam, Very gravelly loam, very cobbly silt loam	*GC, CL	*A-6, A-2-6	0-1	47-54	31-100	28-100	25-98	21-83	28-40	10-19
	9-20	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
BNE:												
Bofecillos------	0-3	*Extremely gravelly sandy clay loam	*SP-SC, SC	*A-2-6, A-2-7	0	0	65-79	19-52	16-51	9-31	30-47	13-24
	3-13	*Bedrock	---	---	---	---	---	---	---	---	---	---
Horsetrap-------	0-3	*Extremely gravelly sandy clay loam	*GP-GC, GC	*A-2-6, A-7-6	0-17	3-17	21-69	18-67	15-64	8-38	29-45	12-21
	3-16	*Extremely gravelly sandy clay loam, Very gravelly loam, very gravelly sandy loam	*GP-GC, GC	*A-2-6, A-2-7, A-2-4	0-16	0-16	22-53	19-51	15-48	8-29	27-45	9-21
	16-26	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
BNG:												
Bofecillos------	0-6	*Very gravelly loam	*GC, GP-GC	*A-2-6, A-6	0-11	13-27	21-60	18-58	15-56	11-43	28-42	12-21
	6-16	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
BOB:												
Boracho---------	0-7	*Very gravelly sandy clay loam	*GC, GP-GC	*A-2-6, A-2-7	0	0-17	28-53	25-51	20-46	11-27	29-43	12-18
	7-15	*Extremely gravelly sandy clay loam, Very gravelly loam, very gravelly clay loam, very gravelly sandy clay loam, extremely gravelly loam	*GP-GC, GC	*A-2-6, A-2-7, A-1-a	0	0-43	19-61	16-59	11-57	5-35	21-46	6-24
	15-19	*Cemented material	---	---	---	---	---	---	---	---	---	---
	19-80	*Extremely gravelly sandy clay loam, Very gravelly loam, very gravelly sandy clay loam, very gravelly sandy loam, extremely gravelly sandy loam	*GP-GC, GC	*A-2-6, A-1-a	0	0-16	24-58	15-53	11-48	5-27	20-36	6-17
Espy----------	0-6	*Gravelly loam	*GC, CL	*A-6, A-2-6, A-7-6	0	0	52-76	50-75	43-74	32-57	29-45	12-21
	6-17	*Gravelly loam, Gravelly clay loam	*GC, CL	*A-6, A-2-6, A-7-6	0	0	52-76	50-75	43-74	33-59	29-45	12-21
	17-24	*Cemented material	---	---	---	---	---	---	---	---	---	---
	24-80	*Very gravelly sandy clay loam	*SC, SP-SC	*A-2-6, A-6	0	0-12	76-92	28-83	23-76	12-44	27-37	12-19
BOC:												
Borunda---------	0-3	*Loam	*CL,	*A-6, A-7-6	0	0	92-100	83-100	69-95	51-73	30-45	12-21
	3-12	*Clay, Clay loam, silty clay loam	*CH, CL	*A-7-6, A-6	0	0	92-100	92-100	66-97	55-85	40-64	21-40
	12-28	*Clay, Clay loam, silty clay loam	*CH, CL	*A-7-6, A-6	0	0	92-100	92-100	66-98	56-86	39-63	21-40
	28-40	*Bedrock	---	---	---	---	---	---	---	---	---	---
	40-62	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Borunda, Gravelly-------	0-5	*Gravelly clay loam	*CL, CH, GC	*A-7-6, A-2-6	0	0-6	54-78	52-77	42-73	33-58	38-53	19-29
	5-12	*Gravelly clay, Gravelly clay loam, silty clay loam	*CH, GC, CL	*A-7-6, A-2-6	0	0-6	54-78	52-77	42-77	33-68	40-64	21-40
	12-30	*Clay, Clay loam, silty clay loam	*CL, CH, GC	*A-7-6, A-2-6	0	0-6	54-92	53-92	43-92	34-82	39-63	21-40
	30-40	*Bedrock	---	---	---	---	---	---	---	---	---	---
	40-62	*Bedrock	---	---	---	---	---	---	---	---	---	---
BRD:												
Brewster--------	0-4	*Very gravelly loam	*GC,	*A-2-7, A-2-6, A-7-6	0-21	0-21	19-53	16-51	13-50	10-42	29-52	12-24
	4-14	*Bedrock	---	---	---	---	---	---	---	---	---	---
BRF:												
Brewster--------	0-4	*Very gravelly clay loam	*GC,	*A-2-7, A-2-6, A-7-6	0-22	0-27	32-66	13-58	11-56	8-44	29-52	12-24
	4-14	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
BRG:												
Brewster--------	0-11	*Very cobbly loam	*GC,	*A-2-7, A-7-6, A-2-6	0-21	0-38	27-72	24-71	20-69	16-59	29-52	12-24
	11-20	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
BUD:												
Buckear---------	0-7	*Very gravelly loam	*GC, GP-GC	*A-2-6, A-6, A-1-a	0-1	0-6	29-61	19-56	16-54	11-41	21-40	6-19
	7-24	*Bedrock	---	---	---	---	---	---	---	---	---	---
Coyanosa--------	0-7	*Extremely gravelly fine sandy loam	*GP-GC, GC	*A-2-4, A-2-6	0	0-10	19-56	16-55	14-54	6-26	23-34	7-15
	7-17	*Bedrock	---	---	---	---	---	---	---	---	---	---
CAA:												
Castolon--------	0-11	*Silty clay loam	*CL, CH	*A-7-6, A-6	0	0	100	100	97-100	93-100	40-51	21-29
	11-23	*Silty clay loam, Silt loam, clay loam, loam	*CL, CH	*A-7-6, A-6	0	0	100	100	92-100	88-100	35-51	17-29
	23-80	*Silt loam, Silty clay, silty clay loam	*CL, CH	*A-6, A-7-6	0	0	100	100	99-100	95-100	35-59	17-36

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CAG:												
Catto----------	0-7	*Very gravelly clay loam	*GC, GM, GP-GC	*A-2-7, A-2-6	0	0	26-52	23-50	14-39	11-31	31-54	13-24
	7-17	*Bedrock	---	---	---	---	---	---	---	---	---	---
Buckear---------	0-13	*Very gravelly loam	*GC, GP-GC	*A-2-6, A-6, A-1-a	0-1	0-6	29-61	19-56	16-54	11-41	21-40	6-19
	13-24	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
CIC:												
Chilicotal------	0-2	*Very gravelly fine sandy loam	*GC, GC-GM	*A-2-4, A-6	0	0-8	32-59	29-57	25-56	16-38	24-39	7-17
	2-40	*Very gravelly loam, Extremely gravelly loam, very gravelly sandy loam, cobbly loam	*GC, GP-GC	*A-2-6, A-1-a, A-6	0	0-16	21-53	18-51	14-47	10-37	21-39	6-19
	40-80	*Very gravelly sandy loam, Extremely gravelly sandy loam, extremely gravelly loam	*GM, GC, GP-GM	*A-1-b, A-2-6, A-1-a	0	0-16	22-54	18-52	13-49	8-35	16-38	2-19
CID:												
Chilicotal------	0-2	*Very gravelly fine sandy loam	*GC, GC-GM	*A-2-4, A-6	0	0-8	32-59	29-57	25-56	16-38	24-39	7-17
	2-40	*Very gravelly loam, Extremely gravelly loam, very gravelly sandy loam, cobbly loam	*GC, GP-GC	*A-2-6, A-1-a, A-6	0	0-16	21-53	18-51	14-47	10-37	21-39	6-19
	40-80	*Very gravelly sandy loam, Extremely gravelly sandy loam, extremely gravelly loam	*GM, GC, GP-GM	*A-1-b, A-2-6, A-1-a	0	0-16	22-54	18-52	13-49	8-35	16-38	2-19
CLC:												
Chilicotal------	0-9	*Gravelly sandy loam	*SC, GC-GM	*A-2-4, A-6	0	0-13	55-84	53-83	40-73	20-42	24-39	7-17
	9-16	*Very gravelly loam, Very gravelly sandy loam, cobbly loam	*GC, GC-GM	*A-2-6, A-6, A-1-a	0	0-11	30-61	26-60	20-56	14-42	21-39	6-19
	16-80	*Very cobbly loam, Very gravelly loam	*GC, GC-GM	*A-2-6, A-1-a, A-6	0	27-34	31-62	28-60	21-57	15-43	20-38	6-19

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Paisano---------	0-5	*Very gravelly fine sandy loam	*GC, GP-GC	*A-2-4, A-2-6	0	0-12	34-59	32-57	28-56	12-26	24-37	7-13
	5-18	*Extremely gravelly loam, Very gravelly loam	*GC, GP-GC	*A-2-4, A-2-6	0	0-22	23-54	19-52	16-48	11-35	24-37	7-13
	18-31	*Cemented material	---	---	---	---	---	---	---	---	---	---
	31-80	*Very gravelly sandy loam, Very gravelly loam	*GC, GM, GP-GC	*A-2-4, A-2-7	0	0-12	31-54	28-52	20-43	9-24	22-45	7-17
CMC:												
Chilimol--------	0-10	*Very gravelly loam	*GC, CL, GC-GM	*A-2-6, A-2-4, A-1-b	0	0	51-76	27-69	22-68	17-56	22-43	6-18
	10-80	*Very gravelly loam, Sandy clay loam	*GC, CL	*A-2-6, A-7-6, A-2-4	0	0	52-84	23-76	19-76	14-58	25-43	9-22
Boracho---------	0-6	*Extremely gravelly sandy loam	*GP-GC, GC	*A-2-4, A-2-6, A-1-a	0	0-17	28-53	25-51	18-42	9-23	22-37	6-13
	6-12	*Extremely gravelly sandy loam, Very gravelly loam, very gravelly sandy clay loam, extremely gravelly loam, extremely gravelly sandy clay loam	*GP-GC, GC	*A-2-4, A-1-a, A-2-7	0	0-43	19-61	16-59	11-55	5-33	21-46	6-24
	12-25	*Cemented material	---	---	---	---	---	---	---	---	---	---
	25-80	*Extremely gravelly sandy loam, Very gravelly loam, very gravelly sandy clay loam, very gravelly sandy loam, extremely gravelly sandy clay loam	*GP-GC, GC	*A-2-4, A-2-6, A-1-a	0	0-11	24-58	15-53	11-46	5-26	20-36	6-17
Berrend---------	0-2	*Loam	*CL, SC	*A-6, A-4	0	0	76-100	76-100	61-90	40-63	27-43	9-17
	2-19	*Clay loam, Sandy clay loam, sandy loam, loam	*CL, SC, CH	*A-6, A-4, A-7-6	0	0	80-100	77-100	59-96	40-71	28-51	10-25
	19-51	*Clay loam, Loam, sandy loam	*CL, SC	*A-6, A-4, A-7-6	0	0	79-100	77-100	56-93	37-68	27-48	10-25
	51-80	*Fine sandy loam	*SC, SC-SM	*A-4, A-2-4, A-6	0	0	80-100	59-100	52-97	21-44	21-32	6-13

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CND:												
Chinati---------	0-3	*Very gravelly loam	*SC, SP-SC	*A-2-6, A-6, A-1-a	0-5	0-17	61-83	22-66	18-63	12-47	22-40	6-17
	3-12	*Very gravelly loam, Very gravelly clay loam, very gravelly sandy clay loam	*SC, GC, SP-SC	*A-2-6, A-7-6	0-5	0-16	59-82	19-64	16-64	12-50	28-47	12-24
	12-21	*Cemented material	---	---	---	---	---	---	---	---	---	---
	21-47	*Bedrock	---	---	---	---	---	---	---	---	---	---
Boracho---------	0-4	*Very gravelly clay loam	*GC,	*A-2-7, A-2-6	0	0-11	31-53	28-51	24-48	19-38	37-49	18-24
	4-12	*Extremely cobbly clay loam, Very gravelly loam, very cobbly loam	*GC, GC-GM	*A-2-6, A-1-a, A-7-6	0	0-47	31-61	28-59	20-57	15-46	21-46	6-24
	12-25	*Cemented material	---	---	---	---	---	---	---	---	---	---
	25-80	*Extremely gravelly sandy clay loam, Very gravelly loam, very gravelly sandy clay loam, very gravelly sandy loam, extremely gravelly sandy loam	*GP-GC, GC	*A-2-6, A-1-a	0	0-11	24-58	15-53	11-48	5-27	20-36	6-17
Berrend---------	0-4	*Sandy loam	*SC,	*A-6, A-4	0	0	76-100	76-100	58-86	36-57	27-43	9-17
	4-20	*Sandy clay loam, Loam, sandy loam	*CL, SC	*A-6, A-2-4, A-7-6	0	0	80-100	77-100	58-94	30-59	28-51	10-25
	20-39	*Sandy clay loam, Sandy loam	*SC, CL	*A-6, A-2-4	0	0	81-100	62-100	50-94	26-54	26-40	9-19
	39-80	*Fine sandy loam	*SC, SC-SM	*A-4, A-6, A-2-4	0	0	80-100	59-100	52-97	21-44	21-32	6-13
CNE:												
Chinati---------	0-5	*Very gravelly fine sandy loam	*SC, SP-SC	*A-2-4, A-2-6, A-1-a	0-5	0-17	61-83	22-66	19-65	8-30	22-37	6-13
	5-9	*Extremely gravelly sandy clay loam, Very gravelly loam, very gravelly clay loam	*SP-SC, GC	*A-2-6, A-7-6	0-5	0-17	58-82	19-64	15-62	8-38	28-47	12-24
	9-29	*Cemented material	---	---	---	---	---	---	---	---	---	---
	29-40	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Boracho---------	0-9	*Very gravelly loam	*GC, GC-GM	*A-2-6, A-2-4, A-1-a	0	0-11	31-53	28-51	22-49	15-37	22-43	6-18
	9-20	*Cemented material	---	---	---	---	---	---	---	---	---	---
	20-80	*Extremely gravelly sandy clay loam, Very gravelly loam, very gravelly sandy clay loam, very gravelly sandy loam, extremely gravelly sandy loam	*GP-GC, GC	*A-2-6, A-2-4, A-1-a	0	0-11	24-57	14-52	11-47	5-27	20-36	6-17
COC:												
Corazones-------	0-2	*Gravelly sandy loam	*SC, SP-SM	*A-2-4, A-1-a, A-6	0	0-1	55-83	26-82	19-67	9-36	19-31	3-12
	2-25	*Very gravelly sandy loam, Extremely gravelly sandy loam	*GC, GW	*A-2-4, A-1-a, A-2-6	0-1	0-10	42-66	13-64	10-53	4-28	19-31	3-12
	25-80	*Extremely gravelly loamy coarse sand, Extremely gravelly loamy sand, very gravelly loamy sand, very gravelly loamy coarse sand	*GW-GM, GW, SC-SM	*A-1-a, A-1-b	0-1	0-10	42-68	13-60	7-36	2-15	0-24	NP-6
Ojinaga---------	0-6	*Very gravelly sandy loam	*SC, GW-GC	*A-2-6, A-2-4	0-5	0-11	47-85	14-82	10-64	5-33	26-33	9-13
	6-12	*Very gravelly coarse sandy loam, Extremely gravelly loam, extremely gravelly sandy loam	*GW-GC, GP, GC	*A-2-6, A-2-4	0-5	0-10	35-63	9-54	5-35	3-22	25-32	9-13
	12-22	*Cemented material	---	---	---	---	---	---	---	---	---	---
	22-49	*Extremely gravelly loamy coarse sand	*GW-GM, GP, GC-GM	*A-1-a, A-1-b	0-5	0-10	37-59	8-51	4-30	2-13	16-24	2-6
	49-69	*Extremely gravelly coarse sandy loam	*GW-GM, GP, GC-GM	*A-1-a, A-1-b	0-5	0-16	35-54	8-47	5-33	3-21	16-24	2-6
	69-80	*Extremely gravelly loamy coarse sand	*GW-GM, GP, GC-GM	*A-1-a, A-1-b	0-5	0-10	37-59	8-51	4-30	2-13	16-24	2-6

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
COE:												
Corazones-------	0-3	*Very gravelly fine sandy loam	*SC, SP-SC	*A-2-4, A-6	0	0-1	57-82	25-82	23-79	10-37	26-33	9-13
	3-43	*Very gravelly fine sandy loam, Very gravelly sandy loam	*GC, GW-GC	*A-2-4, A-2-6	0-1	0-9	44-64	14-64	13-62	6-29	26-33	9-13
	43-80	*Extremely gravelly loamy coarse sand, Extremely gravelly coarse sandy loam	*GP, SP-SC	*A-2-4, A-1-a	0-1	0-9	44-64	14-64	6-33	2-12	21-28	6-10
Ojinaga---------	0-2	*Very gravelly loam	*SC, CL, SP-SC	*A-2-6, A-6, A-2-4	0-5	0-11	57-79	15-79	12-77	9-58	26-39	10-19
	2-16	*Very gravelly loam, Extremely gravelly loam	*GC, SP-SC	*A-2-6, A-6, A-2-4	0-5	0-11	58-59	15-59	13-57	9-43	26-39	10-19
	16-28	*Cemented material	---	---	---	---	---	---	---	---	---	---
	28-80	*Extremely gravelly loam	*GC, GP-GC	*A-2-6, A-6, A-2-4	0-5	0-16	45-71	9-61	7-59	5-44	26-38	10-19
CVC:												
Costavar--------	0-4	*Gravelly sandy clay loam	*SC,	*A-2-6, A-6	0-2	0-4	65-97	45-88	37-81	20-47	29-43	12-18
	4-13	*Very gravelly sandy clay loam, Extremely gravelly sandy clay loam	*SC, SP-SC	*A-2-7, A-7-6, A-2-6	0-2	0-3	64-85	18-69	13-63	7-38	31-47	13-24
	13-23	*Bedrock	---	---	---	---	---	---	---	---	---	---
Volco----------	0-2	*Very gravelly loam	*SC, GC-GM	*A-2-6, A-6, A-2-4	0	7-18	58-83	30-66	23-61	17-46	24-40	7-17
	2-9	*Extremely cobbly loam, Very gravelly loam, very gravelly sandy loam, very gravelly clay loam	*SC, CL, GC	*A-6, A-7-6, A-2-4	0	3-80	48-97	25-80	20-80	14-62	24-49	7-24
	9-22	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EEB:												
Espy----------	0-4	*Fine sandy loam	*SC-SM, SC, SM	*A-2-4, A-6, A-1-b	0	0-8	78-95	57-94	50-93	18-40	20-34	3-11
	4-16	*Fine sandy loam	*SC-SM, SC, SM	*A-2-4, A-6, A-1-b	0	0-8	80-94	52-94	45-94	17-44	20-37	3-13
	16-22	*Cemented material	---	---	---	---	---	---	---	---	---	---
	22-39	*Fine sandy loam	*SC-SM, SC, SM	*A-2-4, A-6, A-1-b	0	0-8	80-94	52-94	46-94	20-48	18-31	3-13
	39-80	*Loamy sand, Fine sandy loam	*SM, SC	*A-2-4, A-6, A-1-b	0	0-8	82-100	63-100	48-94	17-45	0-31	NP-13
Eppenauer-------	0-5	*Fine sandy loam	*SM,	*A-4, A-2-4, A-6	0	0	92-100	91-100	78-99	29-45	20-40	2-12
	5-10	*Sandy clay loam, Loam, clay loam	*SC, CL	*A-6, A-4, A-7-6	0	0	92-100	92-100	74-95	38-56	27-45	9-21
	10-18	*Sandy clay loam, Loam, clay loam	*SC, CL	*A-6, A-2-4, A-7-6	0	0	85-98	84-98	67-94	35-55	26-43	9-21
	18-23	*Loam, Sandy loam, fine sandy loam	*CL, CL-ML	*A-4, A-6	0	0	92-98	92-98	74-89	51-65	20-31	4-12
	23-40	*Bedrock	---	---	---	---	---	---	---	---	---	---
GAA:												
Galindo---------	0-12	*Clay	*CH,	*A-7-6,	0	0	98-100	96-100	78-100	68-91	52-74	29-45
	12-29	*Clay, Silty clay, silty clay loam, clay loam	*CH, CL	*A-7-6,	0	0	96-100	92-100	72-100	61-91	47-73	25-45
	29-47	*Very fine sandy loam, Sandy loam, silt loam, loam, fine sandy loam	*CL-ML, CL, ML	*A-4, A-6	0	0	95-100	95-100	85-100	51-85	16-32	2-13
	47-80	*Fine sand, Very fine sand, loamy fine sand, loamy very fine sand	*SP-SM, SP-SC	*A-2-4, A-3	0	0	95-100	95-100	85-100	5-12	0-21	NP-4
GEF:												
Geefour---------	0-2	*Very gravelly silty clay	*GC, CH	*A-7-6, A-2-7	0-6	0-12	43-61	35-56	33-56	32-56	50-62	29-36
	2-7	*Clay, Silty clay, silty clay loam	*CH, CL	*A-7-6,	0	0-1	79-100	76-100	65-100	52-83	46-62	25-36
	7-20	*Silty clay, Clay, silty clay loam	*CH, CL	*A-7-6,	0	0	100	100	89-100	85-100	46-62	25-36

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Geefour, eroded-	0-2	*Silty clay	*CH,	*A-7-6,	0	0-1	86-100	69-100	65-100	62-100	50-62	29-36
	2-7	*Clay, Silty clay, silty clay loam	*CH, CL	*A-7-6,	0	0-1	79-100	76-100	65-100	52-83	46-62	25-36
	7-20	*Silty clay, Clay, silty clay loam	*CH, CL	*A-7-6,	0	0	100	100	89-100	85-100	46-62	25-36
GFF:												
Geefour---------	0-11	*Clay	*CH, GC	*A-7-6, A-2-7	0	0-6	44-100	36-100	31-100	25-83	46-62	25-36
	11-20	*Clay, Silty clay, silty clay loam	*CH, CL	*A-7-6,	0	0	100	100	85-100	68-83	46-62	25-36
Corazones-------	0-9	*Very gravelly sandy loam	*SC, SP-SM	*A-2-4, A-1-a, A-6	0	0-1	55-83	26-82	19-67	9-36	19-31	3-12
	9-48	*Very cobbly sandy loam, Very gravelly sandy loam	*SC, GW	*A-2-4, A-1-a, A-2-6	0-1	0-43	42-80	13-78	10-64	4-34	18-30	3-12
	48-80	*Extremely gravelly loamy coarse sand, Extremely gravelly coarse sandy loam	*GP, SP-SC	*A-2-4, A-1-a	0-1	0-9	44-64	14-64	6-33	2-12	21-28	6-10
Ojinaga---------	0-4	*Very gravelly sandy loam	*SC, GW-GC	*A-2-6, A-2-4	0-5	0-11	47-85	14-82	10-64	5-33	26-33	9-13
	4-15	*Very gravelly sandy loam, Very gravelly loam, very gravelly coarse sandy loam	*GW-GC, GC, GP	*A-2-6, A-2-4	0-5	0-10	35-63	9-54	7-43	3-22	25-32	9-13
	15-22	*Cemented material	---	---	---	---	---	---	---	---	---	---
	22-49	*Extremely gravelly loamy coarse sand	*GW-GM, GP, GC-GM	*A-1-a, A-1-b	0-5	0-10	37-59	8-51	4-30	2-13	16-24	2-6
	49-69	*Extremely gravelly coarse sandy loam	*GW-GM, GP, GC-GM	*A-1-a, A-1-b	0-5	0-16	35-54	8-47	5-33	3-21	16-24	2-6
	69-80	*Extremely gravelly loamy coarse sand	*GW-GM, GP, GC-GM	*A-1-a, A-1-b	0-5	0-10	37-59	8-51	4-30	2-13	16-24	2-6
GMF:												
Geefour---------	0-5	*Clay	*CH, GC	*A-7-6,	0	0	49-100	46-100	38-100	33-91	51-71	29-44
	5-18	*Clay, Silty clay	*CH, GC	*A-7-6,	0	0	52-100	45-100	37-100	32-91	49-69	29-44
	18-28	*Clay, Silty clay	*CH, CL	*A-7-6,	0	0	96-100	92-100	76-100	65-91	49-69	29-44
Melado----------	0-3	*Silty clay	*CH,	*A-7-6,	0	0	95-100	90-100	82-100	78-100	50-66	29-40
	3-37	*Clay, Silty clay	*CH,	*A-7-6,	0	0	95-100	90-100	78-100	72-95	50-66	29-40
	37-80	*Clay	*CH, GC	*A-7-6,	0	0	70-100	55-100	51-100	44-100	50-70	29-44

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
GSA:												
Gemelo----------	0-6	*Gravelly fine sandy loam	*SC, SC-SM	*A-4, A-6, A-2-4	0	0	83-94	66-88	54-78	30-45	24-33	7-12
	6-14	*Fine sandy loam, Sandy loam, gravelly very fine sandy loam, gravelly sandy loam, very fine sandy loam, gravelly loam, gravelly fine sandy loam, loam	*CL, SC-SM	*A-4, A-6	0	0	94-100	94-100	76-89	41-52	21-30	6-12
	14-25	*Very gravelly fine sandy loam, Very gravelly sandy loam, loam, gravelly fine sandy loam, gravelly sandy loam	*GC, GP-GC	*A-2-4, A-2-6	0	0	48-66	21-55	16-44	9-26	23-31	7-12
	25-36	*Fine sandy loam, Very gravelly fine sandy loam, very gravelly sandy loam, loam, gravelly fine sandy loam, gravelly sandy loam	*SC, SC-SM	*A-6, A-4	0	0	94-100	88-100	68-83	38-49	23-30	7-12
	36-54	*Very gravelly fine sandy loam, Gravelly loamy fine sand, loam, gravelly sandy loam, very gravelly sandy loam, gravelly fine sandy loam	*GC-GM, GW-GC, GC	*A-2-4, A-2-6	0	0	47-71	31-71	23-57	12-32	22-30	7-12
	54-80	*Gravelly sandy loam, Gravelly fine sandy loam, gravelly loamy fine sand	*SC-SM, SC, SW-SM	*A-1-b, A-2-4, A-1-a	0	0	84-94	42-78	25-54	9-24	16-27	2-10
Straddlebug-----	0-4	*Silty clay loam	*CL, CH	*A-7-6, A-6	0	0	94-100	93-100	82-100	72-90	39-53	19-29
	4-18	*Clay, Clay loam	*CH, CL	*A-7-6, A-6	0	0	88-100	88-100	65-93	50-74	39-57	19-33
	18-26	*Clay loam	*CL,	*A-6, A-7-6	0	0	83-100	83-100	74-97	54-73	37-47	19-25
	26-33	*Sandy clay loam	*CL, SC	*A-6, A-7-6	0	0	83-100	83-100	69-98	46-70	31-47	13-25
	33-58	*Fine sandy loam	*CL, SC, SC-SM	*A-4, A-6	0	0	83-100	83-100	71-94	40-56	21-30	6-12
	58-80	*Clay loam	*CL,	*A-6, A-7-6	0	0	82-100	82-100	71-96	50-71	35-47	17-25

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
HOB:												
Holguin---------	0-5	*Very gravelly fine sandy loam	*SC, SP-SC	*A-2-4, A-1-a, A-2-6	0-7	0-6	83-93	25-50	21-48	8-22	21-33	4-12
	5-15	*Bedrock	---	---	---	---	---	---	---	---	---	---
HOD:												
Horsetrap-------	0-4	*Gravelly sandy clay loam	*SC, GC	*A-2-6, A-7-6	0	0	48-83	35-78	29-73	16-43	31-45	13-21
	4-13	*Very gravelly sandy clay loam, Very gravelly loam, very gravelly sandy loam	*GC, GP-GC	*A-2-7, A-2-4	0	0	27-51	27-51	20-46	11-27	27-45	9-21
	13-23	*Bedrock	---	---	---	---	---	---	---	---	---	---
Bofecillos------	0-4	*Very gravelly sandy clay loam	*SP-SC, SP, SC	*A-2-6, A-2-7	0	0	62-79	12-51	9-47	4-26	30-47	13-24
	4-14	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
KIB:												
Kinco----------	0-4	*Gravelly sandy loam	*SC, SC-SM	*A-2-4, A-1-b, A-6	0	0	76-100	51-100	38-81	18-43	21-31	6-12
	4-16	*Sandy loam, Gravelly sandy loam	*SC, SM, SC-SM	*A-2-4, A-1-b, A-6	0	0	84-100	67-100	49-81	24-43	20-40	6-12
	16-26	*Gravelly sandy loam, Sandy loam	*SC, SM, SC-SM	*A-2-4, A-4, A-6	0	0	76-100	52-100	38-81	19-45	22-40	7-13
	26-80	*Gravelly fine sandy loam, Fine sandy loam	*SC, SM, SC-SM	*A-2-4, A-4, A-6	0	0	76-100	52-100	46-97	20-45	22-40	7-13
LGC:												
Lingua----------	0-8	*Very gravelly loam	*SC, SP-SC	*A-2-6,	0	0	67-78	17-50	14-44	10-33	30-43	13-21
	8-18	*Bedrock	---	---	---	---	---	---	---	---	---	---
LIF:												
Lingua----------	0-8	*Very gravelly sandy clay loam	*SC, SP-SC	*A-2-6,	0	0	66-78	15-50	12-46	8-35	30-47	13-24
	8-18	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Ohtwo----------	0-8	*Very gravelly clay loam	*GC,	*A-2-7, A-6, A-2-6	0	0-11	24-52	21-50	18-49	13-39	33-49	13-25
	8-35	*Very gravelly clay loam, Extremely gravelly loam, very gravelly loam, extremely gravelly clay loam	*GC,	*A-2-7, A-6, A-2-6	0	0-12	34-54	32-52	26-51	20-41	32-49	13-25
	35-42	*Very cobbly loam, Extremely gravelly clay loam, very gravelly clay loam, very gravelly loam, extremely gravelly loam	*GC,	*A-6, A-2-6	2-12	28-36	41-80	39-79	33-78	24-61	30-47	13-25
	42-65	*Very gravelly loam, Extremely gravelly clay loam, extremely gravelly loam, very gravelly clay loam	*GC,	*A-2-6, A-6	0	0-12	34-58	31-57	26-56	19-44	30-46	13-25
	65-75	*Bedrock	---	---	---	---	---	---	---	---	---	---
MAE:												
Manzanillo------	0-2	*Very gravelly fine sandy loam	*GC, SC	*A-2-6, A-2-4, A-6	0	0-19	40-91	37-91	34-88	14-40	25-35	9-13
	2-7	*Extremely gravelly fine sandy loam	*GC, GP-GC	*A-2-6, A-2-4	0	13-33	23-63	19-62	17-59	7-27	26-34	9-13
	7-19	*Cemented material	---	---	---	---	---	---	---	---	---	---
	19-29	*Bedrock	---	---	---	---	---	---	---	---	---	---
Paisano---------	0-3	*Very gravelly loam	*SC, SC-SM, CL	*A-2-4, A-6	0	0-5	72-82	35-79	29-73	21-53	24-35	7-13
	3-12	*Very gravelly loam, Very gravelly sandy clay loam	*SC, SC-SM, GC	*A-2-4, A-6	0	0-4	70-78	30-74	25-68	18-50	24-35	7-13
	12-18	*Cemented material	---	---	---	---	---	---	---	---	---	---
	18-80	*Very gravelly sandy loam, Very gravelly sandy clay loam, very gravelly loam	*SC, GP-GC	*A-2-6, A-2-4	0	0-7	50-75	25-50	25-45	10-35	22-36	7-17

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MBE:												
Manzanillo------	0-2	*Gravelly sandy loam	*GC, SC	*A-2-6, A-6, A-2-4	0	0-20	48-91	46-91	34-72	16-38	26-36	9-14
	2-13	*Extremely gravelly sandy clay loam	*GC, GP-GC	*A-2-6,	0	13-33	23-63	19-62	16-55	8-31	28-37	12-16
	13-16	*Cemented material	---	---	---	---	---	---	---	---	---	---
	16-22	*Bedrock	---	---	---	---	---	---	---	---	---	---
Chilicotal------	0-3	*Extremely gravelly sandy clay loam	*GC, GP-GC	*A-2-6, A-2-4	0	0-45	27-57	24-55	19-51	10-29	26-40	9-19
	3-24	*Extremely gravelly sandy clay loam, Extremely gravelly sandy loam	*GP-GC, GC	*A-2-6,	0	0-34	24-53	21-51	17-47	9-27	27-39	12-19
	24-80	*Extremely gravelly sandy clay loam, Extremely gravelly sandy loam	*GP-GC, GC	*A-2-6,	0	0-34	24-54	21-52	17-47	9-27	27-38	12-19
Holguin---------	0-2	*Very gravelly fine sandy loam	*SC, SP-SC	*A-2-4, A-2-6	0	0-3	88-98	26-53	23-50	10-23	23-33	7-12
	2-5	*Extremely gravelly fine sandy loam	*SP-SC, SP, SC	*A-2-4, A-2-6	0	0-10	69-84	6-37	6-36	2-16	23-32	7-12
	5-15	*Bedrock	---	---	---	---	---	---	---	---	---	---
MCA:												
Marfa----------	0-4	*Clay loam	*CL, CH	*A-7-6, A-6	0	0	93-100	91-100	80-96	63-77	39-53	19-25
	4-41	*Clay loam, Clay	*CH, CL	*A-7-6,	0	0	93-100	91-100	81-100	64-86	45-63	25-36
	41-69	*Loam, Clay loam, sandy clay loam, fine sandy loam	*CL, SC-SM	*A-6, A-4, A-7-6	0	0	85-100	83-100	65-100	45-80	21-48	6-25
	69-80	*Loamy fine sand, Fine sandy loam, loam	*SC-SM, SC, SM	*A-2-4, A-4, A-6	0	0	85-100	83-100	73-100	20-42	0-33	NP-13
MDE:												
Mariscal--------	0-5	*Extremely channery loam	*GC, GP-GC	*A-2-6, A-1-a, A-6	0-18	25-44	23-67	21-67	17-65	12-48	22-40	6-19
	5-15	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MOA:												
Martillo--------	0-4	*Clay loam	*CL, CH	*A-6, A-7-6	0	0	86-100	83-100	68-97	52-78	33-51	13-25
	4-23	*Clay	*CH,	*A-7-6,	0	0	80-100	76-100	61-100	53-89	51-74	29-44
	23-80	*Loam, Silty clay loam, clay loam, sandy clay loam	*CL, SC	*A-6, A-7-6	0	0-7	78-100	77-100	64-99	48-77	31-46	13-25
Butcherknife----	0-4	*Silty clay loam	*CL, CH	*A-7-6, A-6	0	0	79-100	74-100	69-100	62-91	40-53	19-25
	4-22	*Clay, Silty clay	*CH,	*A-7-6,	0	0	80-100	76-100	63-97	54-86	51-70	29-40
	22-30	*Clay, Silty clay, silty clay loam	*CH, CL	*A-7-6,	0	0	80-100	76-100	62-97	49-79	41-56	21-33
	30-41	*Clay loam, Loam	*CL,	*A-7-6, A-6	0	0	81-100	77-100	63-96	48-77	32-47	14-25
	41-80	*Bedrock	---	---	---	---	---	---	---	---	---	---
MPB:												
Melado----------	0-4	*Silty clay	*CH,	*A-7-6,	0	0	95-100	90-100	82-100	79-100	50-66	29-40
	4-10	*Silty clay	*CH,	*A-7-6,	0	0	95-100	90-100	82-100	79-100	50-66	29-40
	10-44	*Silty clay	*CH,	*A-7-6,	0	0	95-100	90-100	82-100	79-100	50-66	29-40
	44-61	*Clay loam, Silty clay loam	*CL, CH	*A-7-6, A-6	0	0	95-100	90-100	77-98	59-78	38-51	19-29
	61-80	*Silty clay	*CH, GC	*A-7-6,	0	0	70-100	55-100	49-100	46-100	50-70	29-44
Pantera---------	0-2	*Gravelly coarse sandy loam	*SC-SM, SC, GM	*A-1-b, A-4, A-1-a	0	0	43-100	41-100	24-74	14-49	0-35	NP-12
	2-9	*Silty clay	*CH, SC	*A-7-6, A-2-7	0	0	67-100	34-100	31-100	30-100	50-66	29-40
	9-80	*Extremely gravelly coarse sand, Very gravelly coarse sand, extremely gravelly coarse sandy loam	*GW, SP-SC, GP	*A-1-a, A-2-4	0	6-43	49-77	10-61	5-34	1-11	0-26	NP-7
MUB:												
Murray----------	0-9	*Fine sandy loam	*SC, SM	*A-4, A-2-4, A-6	0	0	86-100	65-100	52-96	19-44	18-37	2-13
	9-26	*Loam, Clay loam	*CL, SC	*A-6, A-7-6	0	0	86-100	64-100	53-100	39-78	28-47	12-24
	26-47	*Sandy clay loam, Loam, clay loam	*SC, CL	*A-6, A-2-6, A-7-6	0	0	86-100	64-100	53-100	28-61	28-45	12-25
	47-80	*Sandy loam, Loam, sandy clay loam	*SC-SM, CL	*A-2-4, A-7-6, A-1-b	0	0	86-100	65-100	48-99	23-61	20-44	6-25

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Marfa----------	0-4	*Clay loam	*CL, CH	*A-7-6, A-6	0	0	93-100	91-100	80-96	63-77	39-53	19-25
	4-41	*Clay, Clay loam	*CH, CL	*A-7-6,	0	0	93-100	91-100	79-100	63-84	45-63	25-36
	41-69	*Loam, Clay loam, sandy clay loam, fine sandy loam	*CL, SC-SM	*A-6, A-4, A-7-6	0	0	85-100	83-100	65-100	45-80	21-48	6-25
	69-80	*Loamy fine sand, Fine sandy loam, loam	*SC-SM, SC, SM	*A-2-4, A-4, A-6	0	0	85-100	83-100	73-100	20-42	0-33	NP-13
Boracho---------	0-5	*Very gravelly loam	*GC, GC-GM	*A-2-6, A-7-6, A-1-a	0	0-17	28-53	25-51	19-48	13-36	22-43	6-18
	5-10	*Extremely gravelly loam, Very gravelly loam, very gravelly clay loam, very gravelly sandy clay loam, extremely gravelly sandy clay loam	*GC, GP-GC	*A-2-6, A-7-6, A-1-a	0	0-43	19-61	16-59	12-59	8-46	21-46	6-24
	10-25	*Cemented material	---	---	---	---	---	---	---	---	---	---
	25-80	*Extremely gravelly sandy clay loam, Very gravelly loam, very gravelly sandy clay loam, very gravelly sandy loam, extremely gravelly sandy loam	*GP-GC, GC	*A-2-6, A-1-a	0	0-11	24-58	15-53	11-48	5-27	20-36	6-17
MZA:												
Musquiz---------	0-7	*Clay loam	*CL,	*A-7-6, A-6	0	0-1	85-98	68-98	59-93	45-73	39-51	19-25
	7-35	*Clay, Clay loam	*CH,	*A-7-6,	0	0-1	86-98	66-98	56-98	45-87	47-68	25-40
	35-80	*Clay loam, Loam, gravelly clay loam, gravelly loam	*CL,	*A-6, A-7-6	0	0-4	79-95	52-91	39-89	29-71	25-47	7-25
NLA:												
Nillo----------	0-3	*Silty clay	*CH, CL	*A-7-6,	0	0	95-100	94-100	84-100	83-100	49-66	28-40
	3-26	*Loam, Silty clay loam, very fine sandy loam, silt loam	*CL, CL-ML	*A-6, A-4, A-7-6	0	0	95-100	95-100	82-100	63-91	23-47	6-25
	26-80	*Clay loam, Clay, silty clay loam	*CL, CH	*A-7-6, A-6	0	0	95-100	95-100	83-100	66-99	36-64	17-40

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
NPB:												
Nolam----------	0-2	*Gravelly sandy loam	*SC, SC-SM	*A-2-4, A-6, A-1-b	0	0	61-100	56-100	40-82	20-45	21-33	6-13
	2-11	*Extremely gravelly sandy clay loam, Extremely gravelly clay loam, very gravelly clay loam, extremely gravelly loam, very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam	*GP-GC, GC	*A-2-6, A-2-7	0	0-16	24-61	14-56	11-54	6-33	29-47	12-25
	11-45	*Very gravelly sandy clay loam, Extremely gravelly clay loam, very gravelly clay loam, extremely gravelly loam, very gravelly sandy loam, extremely gravelly sandy clay loam, very gravelly loam	*GC, GP-GC	*A-2-6, A-2-7	0	0-16	26-61	16-56	13-54	7-33	29-47	12-25
	45-63	*Gravelly sandy loam, Gravelly sandy clay loam, very gravelly coarse sandy loam, extremely gravelly sandy loam, very gravelly sandy clay loam, very gravelly sandy loam, extremely gravelly sandy clay loam	*GC, SC, GW-GC	*A-2-4, A-6, A-1-a	0-5	0-17	37-86	29-84	21-73	10-42	21-36	6-17
	63-80	*Very gravelly sandy loam, Very gravelly sandy clay loam, extremely gravelly sandy clay loam, very gravelly loamy sand, extremely gravelly sandy loam, extremely gravelly coarse sandy loam, very gravelly loam	*GC, GW-GC, SC	*A-2-4, A-6, A-1-a	0-5	0-17	37-86	29-84	22-75	10-43	20-36	6-17

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Paisano---------	0-4	*Extremely gravelly sandy loam	*GP-GC,	*A-2-4, A-1-a	0	0-11	22-57	18-56	12-44	5-23	18-37	2-13
	4-13	*Extremely gravelly sandy clay loam, Very gravelly fine sandy loam, very gravelly loam	*GP-GC, GP, GC	*A-2-6, A-2-4, A-1-a	0	0-10	16-54	13-52	9-46	4-25	19-40	2-17
	13-27	*Cemented material	---	---	---	---	---	---	---	---	---	---
	27-80	*Extremely gravelly loamy sand, Very gravelly loam, very gravelly sandy loam	*GW-GM, GM, GP	*A-1-a, A-2-4, A-2-7	0	0-10	24-57	14-52	11-49	3-18	20-45	4-17
PAC:												
Paisano---------	0-3	*Very gravelly fine sandy loam	*GC, GC-GM	*A-2-4, A-2-6	0	0-12	39-67	37-66	33-64	15-32	24-37	7-13
	3-8	*Very gravelly loam, Very gravelly fine sandy loam	*GC, GC-GM	*A-2-4, A-2-6	0	0-12	32-54	30-52	25-48	17-35	24-37	7-13
	8-14	*Cemented material	---	---	---	---	---	---	---	---	---	---
	14-80	*Very gravelly sandy loam, Very gravelly loam	*GC, GM, GP-GC	*A-2-4, A-2-7	0	0-12	31-54	28-52	20-43	9-24	22-45	7-17
PAD:												
Paisano---------	0-3	*Very gravelly fine sandy loam	*GC, GC-GM	*A-2-4, A-2-6	0	0-12	39-67	37-66	33-64	15-32	24-37	7-13
	3-8	*Very gravelly loam, Very gravelly fine sandy loam	*GC, GC-GM	*A-2-4, A-2-6	0	0-12	32-54	30-52	25-48	17-35	24-37	7-13
	8-14	*Cemented material	---	---	---	---	---	---	---	---	---	---
	14-80	*Very gravelly sandy loam, Very gravelly loam	*GC, GM, GP-GC	*A-2-4, A-2-7	0	0-12	31-54	28-52	20-43	9-24	22-45	7-17
PIB:												
Paisano---------	0-3	*Very gravelly fine sandy loam	*GC, GC-GM	*A-2-4, A-2-6	0	0-12	39-67	37-66	33-64	15-32	24-37	7-13
	3-8	*Very gravelly loam, Very gravelly fine sandy loam	*GC, GC-GM	*A-2-4, A-2-6	0	0-12	32-54	30-52	25-48	17-35	24-37	7-13
	8-14	*Cemented material	---	---	---	---	---	---	---	---	---	---
	14-80	*Very gravelly sandy loam, Very gravelly loam	*GC, GP-GC, GM	*A-2-4, A-2-7	0	0-12	31-54	28-52	20-43	9-24	22-45	7-17

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Musgrave--------	0-5	*Clay loam	*CH, CL	*A-7-6,	0	0	78-100	75-100	67-100	53-86	45-62	25-36
	5-18	*Clay loam, Silty clay loam, silty clay, clay	*CL, CH	*A-7-6,	0	0	100	100	90-100	71-91	44-64	25-40
	18-80	*Clay loam, Silty clay loam, silty clay, clay	*CL, CH	*A-7-6, A-6	0	0	100	100	85-100	66-91	39-62	21-40
PKD:												
Pantak----------	0-3	*Very gravelly sandy clay loam	*GC,	*A-2-6, A-2-7	0	0-11	30-54	27-52	23-49	13-30	36-48	17-25
	3-8	*Extremely gravelly sandy clay loam	*GC,	*A-2-7, A-2-6	0	0-17	25-55	22-53	16-44	10-30	35-46	17-25
	8-22	*Bedrock	---	---	---	---	---	---	---	---	---	---
Lingua----------	0-4	*Extremely gravelly sandy clay loam	*SP-SC, SC	*A-2-7, A-2-6	0	4-21	60-85	13-56	10-50	6-33	28-49	12-25
	4-14	*Bedrock	---	---	---	---	---	---	---	---	---	---
PKE:												
Pantak----------	0-2	*Very gravelly sandy clay loam	*GC, GP-GC	*A-2-6, A-2-7	0	0	27-59	24-58	19-55	10-33	29-46	12-24
	2-6	*Very gravelly sandy clay loam	*GC, GP-GC	*A-2-7, A-2-6	0	0-6	17-54	13-52	10-43	6-30	34-45	17-25
	6-16	*Bedrock	---	---	---	---	---	---	---	---	---	---
Lingua----------	0-8	*Extremely cobbly loam	*GC,	*A-2-6, A-7-6	0-16	21-32	22-65	20-64	17-62	13-47	30-43	13-21
	8-18	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
PTA:												
Phantom---------	0-3	*Clay loam	*CH, CL	*A-7-6,	0	0	98-100	93-100	83-95	66-76	47-57	25-29
	3-27	*Clay, Clay loam, silty clay	*CH, CL	*A-7-6,	0	0	91-100	82-100	65-100	55-92	47-72	25-44
	27-80	*Clay, Clay loam, silty clay	*CH, CL	*A-7-6,	0	0	91-100	82-100	71-100	57-94	46-70	25-44
PZB:												
Phantom---------	0-3	*Clay	*CH,	*A-7-6,	0	0	91-100	82-100	68-97	58-86	51-70	29-40
	3-30	*Clay, Silty clay, clay loam	*CH, CL	*A-7-6,	0	0	91-100	82-100	62-100	54-91	46-72	25-44
	30-80	*Clay, Silty clay, clay loam	*CH, CL	*A-7-6,	0	0	91-100	82-100	64-100	54-91	46-70	25-44

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Musquiz---------	0-8	*Clay loam	*CL,	*A-7-6, A-6	0	0-1	85-98	68-98	59-93	45-73	39-51	19-25
	8-23	*Clay loam, Clay	*CH,	*A-7-6,	0	0-1	87-98	68-98	61-98	48-89	47-68	25-40
	23-80	*Loam, Clay loam, gravelly clay loam, gravelly loam	*CL,	*A-6, A-7-6	0	0-4	79-95	52-91	40-91	29-71	23-45	7-25
QBE:												
Quadria---------	0-5	*Loam	*CL, SC	*A-6, A-7-6	0	0	100	77-100	64-98	45-74	33-49	13-25
	5-17	*Clay, Silty clay	*CH,	*A-7-6,	0	0	100	76-100	60-99	50-85	50-70	29-44
	17-46	*Gravelly clay loam, Gravelly clay, gravelly sandy clay loam, gravelly loam, clay, clay loam, sandy clay loam	*GC, CH, CL	*A-7-6, A-2-6, A-6	0	7-19	49-76	47-75	37-75	28-63	33-57	14-33
	46-57	*Fine sandy loam, Coarse sandy loam, gravelly coarse sandy loam, gravelly sandy loam, gravelly fine sandy loam, sandy loam	*SC, SM, CL	*A-4, A-6, A-2-4	0	0	92-100	84-100	72-98	33-52	18-32	2-12
	57-80	*Gravelly coarse sandy loam, Coarse sandy loam, gravelly coarse sandy loam, gravelly sandy loam, gravelly fine sandy loam, sandy loam	*SC-SM, SC, GM	*A-1-b, A-6, A-1-a	0	7-19	51-92	49-92	28-65	15-41	18-32	2-12
Nolam----------	0-5	*Gravelly loam	*GC, CL	*A-6, A-2-6, A-7-6	0	0	30-77	27-76	23-76	17-60	32-47	13-25
	5-12	*Extremely gravelly clay loam, Extremely gravelly sandy clay loam, extremely gravelly clay, very gravelly clay, very gravelly clay loam	*GC,	*A-2-6, A-7-6	0	0-15	15-45	11-42	10-42	8-37	38-55	19-32

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
	12-18	*Very gravelly clay, Very gravelly silty clay loam, extremely gravelly silty clay loam, extremely gravelly clay loam, extremely gravelly clay, very gravelly clay loam	*GC,	*A-7-6, A-2-7	0	0-17	30-55	27-53	20-50	17-44	41-61	21-37
	18-48	*Extremely cobbly silt loam, Extremely gravelly clay loam, very gravelly clay loam, very gravelly silty clay loam, very gravelly silt loam, extremely gravelly silty clay loam	*GC, GP-GC	*A-2-4, A-2-6	1-10	6-43	20-62	16-60	15-60	12-57	27-47	6-26
	48-80	*Extremely gravelly loam, Extremely gravelly coarse sandy loam, very gravelly loam, very gravelly sandy clay loam, extremely gravelly sandy clay loam	*GC, GP-GC	*A-2-4, A-2-6	0-5	0-16	17-77	14-76	12-72	8-51	24-35	7-15
Musgrave--------	0-5	*Clay loam	*CH, CL	*A-7-6,	0	0	78-100	75-100	67-100	53-86	45-62	25-36
	5-18	*Clay loam, Silty clay loam, silty clay, clay	*CL, CH	*A-7-6,	0	0	100	100	90-100	71-91	44-64	25-40
	18-80	*Clay loam, Silty clay loam, silty clay, clay	*CL, CH	*A-7-6, A-6	0	0	100	100	85-100	66-91	39-62	21-40
RCE:												
Redford---------	0-3	*Very gravelly sandy loam	*GP-GC, GW-GC, GC	*A-2-6, A-2-4	0-3	0-7	41-50	13-49	10-40	5-22	26-33	10-13
	3-14	*Gravelly sandy loam, Very gravelly sandy loam, gravelly fine sandy loam, very gravelly fine sandy loam	*SC, GP, GC	*A-2-6, A-1-a	0-3	0-10	37-64	8-64	5-50	2-26	19-33	4-13
	14-24	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Corazones-------	0-3	*Very gravelly fine sandy loam	*SC, SP-SC	*A-2-4, A-6	0	0-1	57-82	25-82	23-79	10-37	26-33	9-13
	3-48	*Very gravelly fine sandy loam, Very gravelly sandy loam	*GC, GW-GC	*A-2-4, A-2-6	0-1	0-9	44-64	14-64	13-62	6-29	26-33	9-13
	48-80	*Extremely gravelly loamy coarse sand, Extremely gravelly coarse sandy loam	*GP, SP-SC	*A-2-4, A-1-a	0-1	0-9	44-64	14-64	6-33	2-12	21-28	6-10
RCG:												
Redford---------	0-2	*Very gravelly sandy loam	*GP-GC, GP, SC	*A-2-6, A-2-4	0-3	0-7	48-74	7-49	5-40	3-22	26-33	10-13
	2-16	*Very gravelly sandy loam, Gravelly loam, extremely gravelly loam	*GC, GP	*A-2-6, A-1-a	0-3	0-6	43-72	9-72	6-57	2-29	19-33	4-13
	16-26	*Bedrock	---	---	---	---	---	---	---	---	---	---
Corazones-------	0-6	*Very gravelly fine sandy loam	*SC, SP-SC	*A-2-4, A-6	0	0-1	57-82	25-82	23-79	10-37	26-33	9-13
	6-48	*Very gravelly fine sandy loam, Very gravelly sandy loam	*GC, GW-GC	*A-2-4, A-2-6	0-1	0-9	44-64	14-64	13-62	6-29	26-33	9-13
	48-80	*Extremely gravelly loamy coarse sand, Extremely gravelly coarse sandy loam	*GP, SP-SC	*A-2-4, A-1-a	0-1	0-9	44-64	14-64	6-33	2-12	21-28	6-10
RED:												
Redlight--------	0-7	*Very gravelly coarse sandy loam	*GC-GM, GC, GP-GC	*A-1-b, A-1-a, A-2-4	0-2	0-9	35-54	33-53	20-36	11-22	20-30	4-9
	7-15	*Very gravelly coarse sandy loam	*GC-GM, GC	*A-1-b, A-1-a, A-2-4	0	0-12	33-60	30-59	18-40	11-24	19-27	4-8
	15-25	*Bedrock	---	---	---	---	---	---	---	---	---	---
Terlingua-------	0-9	*Very gravelly coarse sandy loam	*GC, GP-GC	*A-2-6, A-2-4	0-1	1-12	37-55	34-53	20-35	12-22	26-35	9-13
	9-19	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
REE:												
Reduff----------	0-4	*Very gravelly loam	*SC, GC	*A-2-6, A-2-7	0	0	64-79	23-50	19-48	14-37	31-45	13-21
	4-15	*Extremely gravelly loam, Very gravelly loam, very gravelly clay loam, extremely gravelly clay loam	*GC,	*A-2-6, A-2-7	13-21	0-5	41-54	14-46	12-44	9-34	30-43	13-21
	15-25	*Bedrock	---	---	---	---	---	---	---	---	---	---
Scotal----------	0-3	*Very gravelly sandy clay loam	*SC, SP-SC	*A-2-6, A-2-7	0-7	0-3	87-99	25-54	20-52	10-32	29-47	12-24
	3-8	*Very gravelly clay loam, Extremely gravelly loam, very gravelly fine sandy loam, extremely gravelly fine sandy loam, very gravelly loam, very gravelly sandy clay loam, extremely gravelly sandy clay loam, extremely gravelly clay loam	*SC,	*A-2-6, A-2-7	0-3	0-7	87-97	30-55	24-54	18-43	29-47	12-24
	8-18	*Bedrock	---	---	---	---	---	---	---	---	---	---
Holguin---------	0-9	*Very gravelly sandy loam	*GC, GP-GC	*A-2-4, A-2-6	0	0	17-54	13-52	10-43	6-26	23-35	7-13
	9-19	*Extremely channery sandy loam, Extremely gravelly loam, very gravelly sandy loam, extremely gravelly sandy clay loam, extremely gravelly sandy loam, very gravelly sandy clay loam, very gravelly loam, extremely channery sandy clay loam, extremely channery loam	*GP-GC, GC	*A-2-4, A-2-6	0	27-45	22-65	20-64	14-51	8-32	23-36	7-15
	19-29	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
RIA:												
Riverwash-------	---	---	---	---	---	---	---	---	---	---	---	---
Pantera---------	0-3	*Gravelly sandy loam	*GC-GM, GP-GM, SC	*A-1-b, A-1-a, A-2-4	0-6	0-18	35-77	33-75	24-62	11-34	16-27	2-10
	3-80	*Very gravelly loamy coarse sand, Extremely gravelly loamy coarse sand, very cobbly loamy coarse sand	*GP-GC, GP, GC-GM	*A-1-a, A-2-4	0-5	1-11	17-54	14-52	7-31	3-14	16-24	2-7
RMB:												
Rockhouse-------	0-13	*Loam	*CL, SC	*A-6,	0-3	1-7	83-96	67-96	57-90	42-68	29-40	12-19
	13-80	*Very gravelly sandy loam, Very gravelly loam, extremely gravelly sandy loam, extremely gravelly loam	*SC, SW-SC	*A-2-6, A-2-4, A-6	0-3	1-16	57-95	15-91	11-73	6-40	25-33	9-13
Medley----------	0-6	*Gravelly sandy clay loam	*SC, CL	*A-2-6, A-6	0	0-4	75-100	49-100	40-91	22-53	29-43	12-18
	6-22	*Sandy clay loam, Gravelly sandy clay loam	*SC, CL	*A-6, A-2-6, A-7-6	0	0-4	75-100	49-100	39-96	21-59	29-47	12-24
	22-58	*Loam, Sandy loam, clay loam	*CL, SC	*A-6, A-2-6, A-7-6	0	0-4	75-100	49-100	41-99	30-77	28-45	12-25
	58-80	*Gravelly loam, Gravelly clay loam, loam	*CL, SC	*A-6, A-2-6, A-7-6	0	0-4	91-100	58-100	48-99	35-77	28-45	12-25

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SCB:												
Sanmoss---------	0-3	*Very gravelly loam	*GC,	*A-2-6, A-2-4, A-6	0-3	0-13	51-73	30-65	25-61	18-45	29-40	9-17
	3-12	*Very gravelly loam, Very gravelly clay loam, very gravelly sandy clay loam	*GC,	*A-2-6, A-2-4, A-7-6	0-3	0-18	51-73	30-65	25-64	18-49	27-45	9-21
	12-40	*Very gravelly loam, Very gravelly clay loam, very gravelly sandy clay loam	*GC, GW-GC	*A-2-6, A-2-4, A-7-6	0-3	0-16	41-73	14-65	12-64	9-49	27-45	9-21
	40-55	*Very gravelly loam, Very gravelly clay loam, very gravelly sandy clay loam	*GC, GW-GC	*A-2-6, A-2-4, A-7-6	0-3	0-16	41-73	14-65	12-64	9-49	26-42	9-21
	55-80	*Very gravelly sandy loam, Very gravelly loam, very gravelly sandy clay loam	*SC, GC, GW-GC	*A-2-4, A-1-a, A-2-6	0-3	1-21	41-70	14-62	10-54	5-31	21-37	6-17
Medley----------	0-11	*Gravelly loam	*SC, CL	*A-6, A-4	0	0-7	86-100	57-100	49-98	35-74	27-43	9-18
	11-25	*Gravelly sandy loam, Gravelly clay loam, gravelly loam, sandy loam, loam	*SC, CL	*A-2-6, A-2-4, A-7-6	0	0-7	86-100	57-100	43-96	22-59	27-47	9-24
	25-80	*Gravelly clay loam, Gravelly sandy loam, gravelly loam, clay loam, loam	*CL, SC	*A-6, A-7-6	0	0-7	84-100	61-100	49-98	37-78	30-47	12-25
SDC:												
Sauceda---------	0-2	*Very gravelly loam	*SC, SP-SC	*A-2-6, A-6, A-1-a	0	0	66-79	15-50	12-47	9-36	21-39	6-17
	2-8	*Very cobbly loam	*GC,	*A-6, A-2-6	0	27-45	36-71	36-71	31-66	22-48	28-39	12-17
	8-22	*Bedrock	---	---	---	---	---	---	---	---	---	---
Boludo----------	0-4	*Very cobbly clay loam	*GC, MH	*A-7-6, A-2-6	0	0-34	32-84	29-83	24-82	18-65	34-55	13-25
	4-11	*Very gravelly clay loam, Very gravelly loam	*GC, CH, GP-GC	*A-2-7, A-7-6, A-2-6	0	0-32	22-85	19-84	16-82	12-66	32-51	13-25
	11-17	*Cemented material	---	---	---	---	---	---	---	---	---	---
	17-27	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
SEE:												
Sauceda---------	0-2	*Very gravelly loam	*SC, SP-SC	*A-2-6, A-6, A-1-a	0	0	66-79	15-50	12-47	9-36	21-39	6-17
	2-8	*Very cobbly loam	*GC,	*A-6, A-2-6	0	27-45	36-71	36-71	31-66	22-48	28-39	12-17
	8-22	*Bedrock	---	---	---	---	---	---	---	---	---	---
Decoty----------	0-5	*Very gravelly fine sandy loam	*SC-SM, SC	*A-2-4, A-6, A-1-b	0	6-19	62-82	36-65	31-61	18-39	21-35	4-12
	5-14	*Extremely cobbly fine sandy loam, Very gravelly loam, very gravelly sandy loam	*SC-SM, SP-SC, SC	*A-2-4, A-6, A-1-a	0	13-35	65-82	23-64	18-55	11-38	21-35	4-12
	14-24	*Bedrock	---	---	---	---	---	---	---	---	---	---
SHC:												
Scotal----------	0-3	*Very gravelly sandy clay loam	*SC, SP-SC	*A-2-6, A-2-7	0-7	0-3	87-99	25-54	20-52	10-32	29-47	12-24
	3-8	*Very gravelly clay loam, Extremely gravelly loam, very gravelly fine sandy loam, extremely gravelly fine sandy loam, very gravelly loam, very gravelly sandy clay loam, extremely gravelly sandy clay loam, extremely gravelly clay loam	*SC,	*A-2-6, A-2-7	0-3	0-7	87-97	30-55	24-54	18-43	29-47	12-24
	8-24	*Bedrock	---	---	---	---	---	---	---	---	---	---
Holguin---------	0-9	*Very gravelly sandy loam	*GC, GP-GC	*A-2-4, A-2-6	0	0	17-54	13-52	10-42	6-25	23-33	7-12
	9-19	*Extremely channery sandy loam, Extremely gravelly loam, extremely gravelly sandy loam, very gravelly sandy loam, very gravelly loam, extremely channery loam	*GP-GC, GC	*A-2-4, A-2-6	0	27-45	22-65	20-64	14-49	8-30	23-33	7-12
	19-29	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
SHE:												
Scotal----------	0-2	*Very gravelly loam	*GC, GC-GM, CL	*A-4, A-1-b, A-6	0	37-66	36-80	35-80	29-79	20-59	21-40	6-19
	2-7	*Extremely gravelly loam, Very gravelly loam, extremely gravelly fine sandy loam, very gravelly fine sandy loam, extremely gravelly sandy clay loam	*GP-GC, GC	*A-2-6, A-1-a	0	0	15-52	12-50	9-47	6-35	21-39	6-19
	7-17	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
SIG:												
Scotal----------	0-3	*Very gravelly sandy clay loam	*SC, SP-SC	*A-2-6, A-2-7	0-6	0-3	78-98	12-53	9-51	5-32	29-47	12-24
	3-8	*Very gravelly clay loam, Extremely gravelly loam, very gravelly fine sandy loam, extremely gravelly fine sandy loam, very gravelly loam, very gravelly sandy clay loam, extremely gravelly sandy clay loam, extremely gravelly clay loam	*GC,	*A-2-6, A-2-7	0	0	43-50	36-45	36-40	26-32	28-46	12-24
	8-18	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Ohtwo----------	0-8	*Very gravelly clay loam	*GC, GP-GC	*A-2-7, A-7-6, A-2-6	0	0-16	22-52	18-50	15-49	12-39	33-49	13-25
	8-35	*Very gravelly clay loam, Extremely gravelly loam, very gravelly loam, extremely gravelly clay loam	*GC, CL	*A-7-6, A-2-6	0	0-16	23-73	20-72	17-71	13-57	32-49	13-25
	35-42	*Very cobbly loam, Very gravelly loam, extremely gravelly loam, very gravelly clay loam, extremely gravelly clay loam	*GC, CL	*A-6, A-2-6, A-7-6	2-11	28-33	31-79	28-78	24-78	18-61	30-45	13-25
	42-65	*Very gravelly loam, Extremely gravelly loam, extremely gravelly clay loam, very gravelly clay loam	*GC, GP-GC	*A-2-6, A-7-6	0	0-11	19-55	19-55	16-54	12-42	29-44	13-25
	65-80	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
SRA:												
Straddlebug-----	0-4	*Silty clay loam	*CL, CH	*A-7-6, A-6	0	0	92-100	91-100	80-100	70-90	39-53	19-29
	4-18	*Clay, Clay loam	*CH, CL	*A-7-6, A-6	0	0	84-100	83-100	62-93	47-74	39-57	19-33
	18-26	*Clay loam	*CL,	*A-6, A-7-6	0	0	83-100	83-100	74-97	54-73	37-47	19-25
	26-33	*Sandy clay loam	*CL, SC	*A-6, A-7-6	0	0	83-100	83-100	69-98	46-70	31-47	13-25
	33-58	*Fine sandy loam	*CL, SC-SM	*A-4, A-6	0	0	83-100	83-100	71-94	40-56	21-30	6-12
	58-80	*Clay loam	*CL,	*A-6, A-7-6	0	0	82-100	82-100	71-96	50-71	35-47	17-25
STE:												
Strawhouse------	0-3	*Very gravelly sandy loam	*GC-GM, GC, GP-GM	*A-1-b, A-1-a, A-2-6	0-6	0-6	28-52	25-50	20-50	11-33	19-39	3-19
	3-7	*Very gravelly loam, Very gravelly clay loam, very gravelly sandy loam	*GC, GP-GC	*A-2-4, A-1-a, A-2-6	0-6	0-6	28-52	25-50	19-47	12-33	20-38	6-19
	7-28	*Cemented material	---	---	---	---	---	---	---	---	---	---
	28-80	*Very gravelly sandy clay loam, Extremely gravelly sandy clay loam	*GC, GP-GC	*A-2-6,	0-5	0-11	21-52	17-50	15-46	8-26	29-37	13-19

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Stillwell-------	0-7	*Very gravelly coarse sandy loam	*GM, GW-GM, GC	*A-1-a, A-2-6	0-1	0-8	32-54	29-52	13-30	8-21	17-33	2-12
	7-25	*Very gravelly fine sandy loam, Very gravelly loam, very gravelly sandy loam	*GC-GM, GW-GM, GC	*A-1-b, A-1-a, A-2-6	0-1	0-8	32-54	29-52	22-44	12-26	18-30	3-12
	25-80	*Extremely gravelly coarse sandy loam, Extremely gravelly loam, extremely gravelly sandy loam	*GP-GC, GP, GC	*A-1-a, A-2-6	0-1	0-5	17-55	14-53	9-39	4-22	18-30	3-12
SUD:												
Studybutte------	0-5	*Very gravelly sandy clay loam	*GC, GP-GC	*A-2-6, A-2-7	0-1	0-16	18-53	15-51	12-47	7-29	30-45	13-22
	5-10	*Extremely gravelly sandy clay loam, Very gravelly sandy clay loam, very gravelly loam, extremely gravelly fine sandy loam	*GP-GC, GC	*A-2-6, A-2-4, A-2-7	0-1	0-16	25-57	15-51	11-47	6-29	25-45	8-22
	10-20	*Bedrock	---	---	---	---	---	---	---	---	---	---
SUE:												
Studybutte	0-3	*Very gravelly loam	*GC, GP-GC	*A-2-4, A-2-6, A-1-a	0-21	0-21	24-57	14-51	11-50	7-37	17-39	2-17
	3-6	*Extremely gravelly loam, Very gravelly loam, very gravelly fine sandy loam, extremely gravelly fine sandy loam	*GC, GP-GC	*A-2-4, A-2-6, A-1-a	0-21	0-21	24-57	14-52	11-50	7-37	17-39	2-17
	6-16	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SUG:												
Studybutte------	0-3	*Very gravelly loam	*GC, GP-GC	*A-2-4, A-2-6, A-1-a	0-21	0-21	24-57	14-51	11-50	7-37	17-39	2-17
	3-6	*Extremely gravelly loam, Very gravelly loam, very gravelly fine sandy loam, extremely gravelly fine sandy loam	*GC, GP-GC	*A-2-4, A-2-6, A-1-a	0-21	0-21	24-57	14-52	11-50	7-37	17-39	2-17
	6-16	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
TEA:												
Tenneco---------	0-3	*Silt loam	*CL,	*A-6,	0	0	98-100	93-100	83-100	70-87	30-43	12-21
	3-28	*Silt loam, Clay loam, silty clay loam	*CL,	*A-6, A-7-6	0	0	98-100	93-100	83-100	72-94	30-47	12-25
	28-80	*Gravelly clay loam, Sandy clay loam, stratified loamy coarse sand to fine sandy loam to loam to clay loam to silty clay loam to silty clay	*CL, SC-SM, CH	*A-7-6, A-2-4	0	0	86-100	52-100	38-100	27-88	23-56	6-32
Bodecker--------	0-8	*Loam	*CL, GC-GM	*A-6, A-4, A-2-4	0	0	66-100	61-100	48-94	34-70	21-40	6-17
	8-14	*Loam, Clay loam, gravelly sandy loam	*CL, GC-GM	*A-6, A-4, A-2-4	0	0	62-100	57-100	45-99	31-75	21-43	6-21
	14-35	*Very gravelly coarse sand, Very gravelly sand, very gravelly loamy sand, very gravelly sandy loam	*GP-GM, GW, GC	*A-1-a, A-2-6	0	0	26-57	16-52	7-33	2-15	0-34	NP-14
	35-80	*Gravelly sandy clay loam, Very gravelly sandy loam, very gravelly loam, gravelly clay loam	*GC, GP-GC	*A-2-6, A-7-6, A-1-a	0	0	26-80	16-77	12-77	6-47	22-47	6-25
TRE:												
Terlingua-------	0-9	*Very gravelly sandy loam	*SC, GW-GM, GC	*A-2-4, A-2-6, A-1-a	0-3	8-10	53-73	22-73	14-60	6-33	17-35	2-13
	9-19	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
TRG:												
Terlingua-------	0-13	*Very gravelly coarse sandy loam	*GC-GM, GP-GM, GC	*A-1-a, A-2-4	0-5	0-11	26-53	23-51	14-36	8-24	17-28	2-10
	13-23	*Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock	---	---	---	---	---	---	---	---	---	---
VAA:												
Verhalen--------	0-7	*Silty clay	*CH, CL	*A-7-6,	0	0	56-100	12-100	11-100	11-100	47-72	25-44
	7-54	*Silty clay, Clay, clay loam	*CH, CL	*A-7-6,	0	0	80-100	60-100	52-100	50-100	46-72	25-44
	54-80	*Clay, Clay loam, silty clay	*CH, CL, SC	*A-7-6,	0	0	80-100	59-100	51-100	41-94	46-70	25-44
VCA:												
Vicente---------	0-9	*Loam	*CL,	*A-6,	0	0	92-100	91-100	86-100	69-84	31-40	12-19
	9-80	*Stratified loam to silt loam to clay loam, Loam, silt loam, very fine sandy loam	*CL, CL-ML	*A-4, A-6	0	0	92-100	91-100	86-100	68-83	21-30	6-12
Lomapelona------	0-11	*Loam	*CL, SC-SM	*A-6, A-2-4	0	0	92-100	77-100	67-100	34-62	21-39	6-19
	11-80	*Very fine sandy loam, Sandy loam, fine sandy loam, loam	*CL, SC-SM	*A-4, A-2-4, A-6	0	0	86-100	65-100	62-100	35-64	21-32	6-13
Castolon--------	0-11	*Silty clay loam	*CL,	*A-7-6, A-6	0	0	100	100	97-100	93-100	40-51	21-29
	11-23	*Silty clay loam, Silt loam, clay loam, loam	*CL, CH	*A-7-6, A-6	0	0	100	100	92-100	88-100	35-51	17-29
	23-80	*Silt loam, Silty clay, silty clay loam	*CL, CH	*A-6, A-7-6	0	0	100	100	99-100	95-100	35-59	17-36
VOC:												
Volco-----------	0-5	*Very gravelly loam	*SC, CL, GC-GM	*A-2-6, A-6, A-2-4	0	0-18	58-83	30-75	23-68	17-52	24-40	7-17
	5-18	*Very gravelly loam, Very gravelly sandy loam, very gravelly clay loam	*SC, CL, SP-SC	*A-2-6, A-7-6, A-2-4	0	2-22	57-80	15-70	12-70	8-54	24-49	7-24
	18-28	*Bedrock	---	---	---	---	---	---	---	---	---	---

Table 28.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Pardo----------	0-5	*Gravelly clay loam	*SC, CL	*A-7-6, A-6	0	0	85-98	56-82	49-80	38-64	39-55	17-25
	5-15	*Very gravelly clay loam, Very gravelly loam, extremely gravelly loam, extremely gravelly clay loam	*GC, CL, GP-GC	*A-2-7, A-7-6, A-2-6	0	13-21	43-80	19-76	16-75	12-60	33-51	13-25
	15-18	*Cemented material	---	---	---	---	---	---	---	---	---	---
	18-28	*Bedrock	---	---	---	---	---	---	---	---	---	---
W:												
Water----------	---	---	---	---	---	---	---	---	---	---	---	---

Table 29.--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					
ALB:												
Altar----------	0-10	10-25	1.30-1.60	2-6	0.07-0.10	0.0-3.0	0.5-1.0	.15	.20	2	5	56
	10-26	12-30	1.45-1.65	2-6	0.03-0.05	0.0-3.0	0.3-0.6	.02	.17			
	26-80	10-30	1.50-1.70	2-6	0.03-0.05	0.0-3.0	0.1-0.3	.05	.24			
Bodecker----------	0-5	2-15	1.25-1.45	6-20	0.02-0.05	0.0-2.9	0.5-2.0	.02	.10	5	3	86
	5-30	2-10	1.40-1.65	20-40	0.01-0.03	0.0-2.9	0.5-1.0	.02	.02			
	30-80	2-10	1.45-1.70	20-40	0.01-0.03	0.0-2.9	0.5-1.0	.02	.02			
Riverwash----------	---	---	---	---	---	---	---	---	---	-	---	---
ANS:												
Area not surveyed---	---	---	---	---	---	---	---	---	---	-	---	---
BAC:												
Baviza----------	0-3	1-10	1.35-1.55	6-20	0.06-0.10	0.0-2.9	0.5-1.0	.32	.32	5	2	134
	3-29	2-8	1.40-1.60	6-20	0.02-0.05	0.0-2.9	0.5-1.0	.02	.02			
	29-80	1-5	1.40-1.60	6-20	0.02-0.05	0.0-2.9	0.3-0.8	.02	.02			
Pantera----------	0-2	1-5	1.40-1.60	6-20	0.01-0.03	0.0-2.9	0.1-0.5	.02	.05	5	2	134
	2-80	1-5	1.20-1.50	6-20	0.01-0.03	0.0-2.9	0.1-0.3	.02	.02			
BEB:												
Berrend----------	0-2	15-25	1.55-1.65	0.2-0.6	0.14-0.19	3.0-5.9	1.0-4.0	.24	.24	5	5	56
	2-19	15-35	1.55-1.65	0.2-0.6	0.14-0.19	3.0-5.9	1.0-3.0	.20	.20			
	19-38	15-35	1.40-1.65	0.2-0.6	0.17-0.21	3.0-5.9	1.0-2.0	.28	.28			
	38-60	15-28	1.40-1.65	0.6-2	0.13-0.18	1.0-2.9	0.5-1.5	.28	.28			
	60-80	10-19	1.25-1.45	2-6	0.08-0.15	0.0-2.9	0.5-1.0	.24	.24			
Espy----------	0-4	7-17	1.30-1.50	0.6-2	0.08-0.15	0.0-2.9	1.0-3.0	.24	.24	1	3	86
	4-12	7-20	1.30-1.50	0.6-2	0.08-0.15	0.0-2.9	1.0-3.0	.32	.32			
	12-18	---	---	0.00-0.2	---	---	---	---	---			
	18-80	13-20	1.45-1.60	0.6-2	0.15-0.20	0.0-2.9	0.1-0.3	.37	.37			
BIC:												
Bissett----------	0-2	18-35	1.45-1.65	0.6-2	0.08-0.11	0.0-2.9	1.0-5.0	.10	.28	1	6	48
	2-9	18-35	1.45-1.65	0.6-2	0.08-0.11	0.0-2.9	0.8-5.0	.10	.32			
	9-19	---	---	0.01-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.01-0.06	---	---	---	---	---	-	---	---

Table 29.--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					
BIE:												
Bissett----------	0-2	18-35	1.45-1.65	0.6-2	0.08-0.11	0.0-2.9	1.0-5.0	.10	.28	1	6	48
	2-9	18-35	1.45-1.65	0.6-2	0.08-0.11	0.0-2.9	0.8-5.0	.10	.32			
	9-19	---	---	0.01-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.01-0.06	---	---	---	---	---	-	---	---
BIG:												
Bissett----------	0-2	18-35	1.45-1.65	0.6-2	0.08-0.11	0.0-2.9	1.0-5.0	.10	.28	1	6	48
	2-9	18-35	1.45-1.65	0.6-2	0.08-0.11	0.0-2.9	0.8-5.0	.10	.32			
	9-19	---	---	0.01-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.01-0.06	---	---	---	---	---	-	---	---
BLE:												
Blackgap----------	0-4	12-27	1.45-1.65	0.6-2	0.07-0.12	0.0-2.9	1.0-3.0	.10	.43	1	6	48
	4-9	18-27	1.45-1.65	0.6-2	0.07-0.12	0.0-2.9	0.5-2.0	.10	.37			
	9-20	---	---	0.06-2	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.06-2	---	---	---	---	---	-	---	---
BLG:												
Blackgap----------	0-4	12-27	1.45-1.65	0.6-2	0.07-0.12	0.0-2.9	1.0-3.0	.10	.43	1	6	48
	4-9	18-27	1.45-1.65	0.6-2	0.07-0.12	0.0-2.9	0.5-2.0	.10	.37			
	9-20	---	---	0.06-2	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.06-2	---	---	---	---	---	-	---	---
BNE:												
Bofecillos----------	0-3	20-35	1.45-1.60	0.2-0.6	0.03-0.06	0.0-2.9	0.5-2.0	.05	.32	1	8	0
	3-13	---	---	0.00-0.01	---	---	---	---	---			
Horsetrap----------	0-3	18-30	1.35-1.55	0.6-2	0.02-0.04	0.0-2.9	1.0-3.0	.05	.28	1	8	0
	3-16	15-30	1.35-1.60	0.6-2	0.05-0.07	0.0-2.9	1.0-3.0	.05	.28			
	16-26	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
BNG:												
Bofecillos----------	0-6	18-30	1.30-1.55	0.2-0.6	0.09-0.13	0.0-2.9	0.5-1.5	.15	.43	1	8	0
	6-16	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---

Table 29.--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					
BOB:												
Boracho----------	0-7	18-27	1.40-1.55	0.6-2	0.07-0.09	0.0-2.9	1.0-3.0	.10	.28	1	6	48
	7-15	10-35	1.40-1.55	0.6-2	0.05-0.09	0.0-2.9	0.5-1.5	.02	.28			
	15-19	---	---	0.00-0.2	---	---	---	---	---			
	19-80	10-25	1.45-1.70	2-6	0.03-0.05	0.0-2.9	0.1-0.5	.05	.24			
Espy----------	0-6	18-30	1.30-1.50	0.6-2	0.11-0.14	0.0-2.9	1.0-3.0	.20	.37	1	7	38
	6-17	18-30	1.30-1.50	0.6-2	0.11-0.14	0.0-2.9	1.0-3.0	.20	.37			
	17-24	---	---	0.00-0.2	---	---	---	---	---			
	24-80	18-27	1.45-1.60	2-6	0.08-0.11	0.0-2.9	0.1-0.3	.05	.20			
BOC:												
Borunda----------	0-3	18-30	1.45-1.65	0.6-2	0.06-0.12	3.0-5.9	0.5-2.0	.37	.37	2	4L	86
	3-12	30-55	1.45-1.70	0.06-0.6	0.15-0.20	3.0-5.9	0.5-1.0	.24	.24			
	12-28	30-55	1.45-1.70	0.06-0.6	0.11-0.15	3.0-5.9	0.1-0.3	.24	.24			
	28-40	---	---	0.00-0.06	---	---	---	---	---			
	40-62	---	---	0.00-0.06	---	---	---	---	---			
Borunda, gravelly---	0-5	27-40	1.45-1.65	0.2-0.6	0.15-0.20	3.0-5.9	0.5-2.0	.17	.28	2	5	56
	5-12	30-55	1.45-1.65	0.06-0.6	0.07-0.12	3.0-5.9	0.5-1.0	.15	.24			
	12-30	30-55	1.45-1.70	0.06-0.6	0.11-0.15	3.0-5.9	0.1-0.3	.32	.32			
	30-40	---	---	0.00-0.06	---	---	---	---	---			
	40-62	---	---	0.00-0.06	---	---	---	---	---			
BRD:												
Brewster----------	0-4	18-35	1.30-1.55	0.6-2	0.05-0.14	0.0-4.0	1.0-4.0	.10	.32	1	8	0
	4-14	---	---	0.00-0.01	---	---	---	---	---			
BRF:												
Brewster----------	0-4	18-35	1.30-1.55	0.2-0.6	0.05-0.14	0.0-4.5	1.0-4.0	.10	.28	1	8	0
	4-14	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
BRG:												
Brewster----------	0-11	18-35	1.30-1.55	0.6-2	0.05-0.14	0.0-2.9	1.0-4.0	.10	.32	1	8	0
	11-20	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
BUD:												
Buckear----------	0-7	10-27	1.45-1.65	0.6-2	0.05-0.07	0.0-2.9	0.5-2.0	.15	.37	1	6	48
	7-24	---	---	0.01-0.06	---	---	---	---	---			

Table 29.--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					
Coyanosa----------	0-7	12-22	1.40-1.55	0.6-2	0.05-0.07	0.0-2.9	0.5-1.0	.05	.28	1	8	0
	7-17	---	---	0.00-0.01	---	---	---	---	---			
CAA:												
Castolon----------	0-11	30-40	1.25-1.35	0.2-0.6	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43	5	4L	86
	11-23	25-40	1.25-1.35	0.2-0.6	0.16-0.24	3.0-5.9	0.3-0.8	.43	.43			
	23-80	25-50	1.20-1.30	0.2-0.6	0.16-0.24	3.0-5.9	0.3-0.8	.49	.49			
CAG:												
Catto----------	0-7	20-35	1.45-1.55	0.6-2	0.08-0.11	0.0-2.9	1.0-5.0	.05	.20	1	8	0
	7-17	---	---	0.00-0.01	---	---	---	---	---			
Buckear----------	0-13	10-27	1.45-1.65	0.6-2	0.05-0.07	0.0-2.9	0.5-2.0	.15	.37	2	6	48
	13-24	---	---	0.01-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
CIC:												
Chilicotal----------	0-2	12-25	1.40-1.60	0.6-2	0.07-0.09	0.0-2.9	0.8-2.0	.15	.37	5	6	48
	2-40	10-27	1.40-1.60	0.6-2	0.08-0.11	0.0-2.9	0.2-1.0	.10	.37			
	40-80	5-27	1.40-1.65	0.6-2	0.06-0.08	0.0-2.9	0.1-0.5	.10	.43			
CID:												
Chilicotal----------	0-2	12-25	1.40-1.60	0.6-2	0.07-0.09	0.0-2.9	0.8-2.0	.15	.37	5	6	48
	2-40	10-27	1.40-1.60	0.6-2	0.08-0.11	0.0-2.9	0.2-1.0	.10	.37			
	40-80	5-27	1.40-1.65	0.6-2	0.06-0.08	0.0-2.9	0.1-0.5	.10	.43			
CLC:												
Chilicotal----------	0-9	12-25	1.40-1.60	0.6-2	0.08-0.12	0.0-2.9	0.8-2.0	.15	.24	5	5	56
	9-16	10-27	1.40-1.60	0.6-2	0.05-0.12	0.0-2.9	0.2-1.0	.15	.37			
	16-80	10-27	1.40-1.65	0.6-2	0.05-0.12	0.0-2.9	0.1-0.5	.10	.37			
Paisano----------	0-5	12-20	1.45-1.60	2-6	0.05-0.11	0.0-2.9	1.0-3.0	.10	.28	1	6	48
	5-18	12-20	1.45-1.60	2-6	0.05-0.11	0.0-2.9	1.0-3.0	.10	.43			
	18-31	---	---	0.00-0.2	---	---	---	---	---			
	31-80	12-25	1.45-1.60	2-6	0.05-0.11	0.0-2.9	0.1-5.0	.02	.10			
CMC:												
Chilimol----------	0-10	10-27	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	1.0-3.0	.15	.37	5	8	0
	10-80	15-32	1.35-1.60	0.6-2	0.09-0.13	0.0-2.9	0.3-1.0	.15	.37			

Table 29.--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					
Boracho----------	0-6	10-20	1.40-1.55	0.6-2	0.08-0.12	0.0-2.9	1.0-3.0	.05	.24	1	8	0
	6-12	10-35	1.40-1.55	0.6-2	0.05-0.09	0.0-2.9	0.5-1.5	.05	.24			
	12-25	---	---	0.00-0.2	---	---	---	---	---			
	25-80	10-25	1.45-1.70	2-6	0.03-0.05	0.0-2.9	0.1-0.5	.05	.24			
Berrend----------	0-2	15-25	1.30-1.60	0.6-2	0.13-0.18	0.0-2.9	1.0-4.0	.32	.32	5	6	48
	2-19	15-35	1.45-1.65	0.2-0.6	0.17-0.21	3.0-5.9	1.0-3.0	.28	.28			
	19-51	15-35	1.45-1.65	0.2-0.6	0.17-0.21	3.0-5.9	0.5-1.5	.28	.28			
	51-80	10-19	1.25-1.45	2-6	0.08-0.15	0.0-2.9	0.5-1.0	.24	.24			
CND:												
Chinati----------	0-3	10-25	1.40-1.55	2-6	0.06-0.10	0.0-2.9	1.0-3.0	.15	.37	1	7	38
	3-12	18-35	1.40-1.55	0.6-2	0.07-0.11	0.0-2.9	0.5-2.0	.15	.37			
	12-21	---	---	0.00-0.2	---	---	---	---	---			
	21-47	---	---	0.00-0.2	---	---	---	---	---			
Boracho----------	0-4	27-35	1.40-1.55	0.6-2	0.08-0.12	0.0-2.9	1.0-3.0	.10	.28	1	6	48
	4-12	10-35	1.40-1.55	0.6-2	0.05-0.09	0.0-2.9	0.5-1.5	.05	.37			
	12-25	---	---	0.00-0.2	---	---	---	---	---			
	25-80	10-25	1.45-1.70	2-6	0.03-0.05	0.0-2.9	0.1-0.5	.05	.24			
Berrend----------	0-4	15-25	1.30-1.60	0.6-2	0.08-0.13	0.0-2.9	1.0-4.0	.28	.28	5	3	86
	4-20	15-35	1.55-1.65	0.2-0.6	0.14-0.19	3.0-5.9	1.0-3.0	.20	.20			
	20-39	15-28	1.30-1.60	0.6-2	0.08-0.13	0.0-2.9	0.5-1.5	.24	.24			
	39-80	10-19	1.25-1.45	2-6	0.08-0.15	0.0-2.9	0.5-1.0	.24	.24			
CNE:												
Chinati----------	0-5	10-20	1.40-1.55	2-6	0.06-0.10	0.0-2.9	1.0-3.0	.10	.28	1	6	48
	5-9	18-35	1.40-1.55	0.6-2	0.07-0.11	0.0-2.9	0.5-2.0	.05	.28			
	9-29	---	---	0.00-0.2	---	---	---	---	---			
	29-40	---	---	0.00-0.2	---	---	---	---	---			
Boracho----------	0-9	10-27	1.40-1.55	0.6-2	0.08-0.12	0.0-2.9	1.0-3.0	.15	.37	1	6	48
	9-20	---	---	0.00-0.2	---	---	---	---	---			
	20-80	10-25	1.45-1.70	2-6	0.03-0.05	0.0-2.9	0.1-0.5	.05	.24			
COC:												
Corazones----------	0-2	7-18	1.45-1.60	2-6	0.07-0.10	0.0-2.9	0.5-1.0	.10	.24	5	5	56
	2-25	7-18	1.45-1.65	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.05	.24			
	25-80	3-10	1.45-1.65	2-6	0.02-0.04	0.0-2.9	0.3-0.8	.02	.17			

Table 29.--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					
Ojinaga----------	0-6	15-20	1.00-1.55	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.10	.24	1	6	48
	6-12	15-20	1.00-1.60	2-6	0.03-0.06	0.0-2.9	0.3-0.8	.05	.24			
	12-22	---	---	0.00-0.2	---	---	---	---	---			
	22-49	5-10	1.00-1.60	2-6	0.01-0.03	0.0-2.9	0.3-0.8	.02	.05			
	49-69	5-10	1.00-1.60	2-6	0.02-0.03	0.0-2.9	0.3-0.8	.02	.20			
	69-80	5-10	1.00-1.60	2-6	0.01-0.03	0.0-2.9	0.3-0.8	.02	.05			
COE:												
Corazones----------	0-3	15-20	1.45-1.60	2-6	0.07-0.09	0.0-2.9	0.5-1.0	.10	.24	5	6	48
	3-43	15-20	1.45-1.65	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.05	.24			
	43-80	10-15	1.45-1.65	2-6	0.05-0.70	0.0-2.9	0.3-0.8	.02	.05			
Ojinaga----------	0-2	16-28	1.00-1.55	2-6	0.09-0.13	0.0-2.9	0.5-1.0	.17	.43	1	6	48
	2-16	16-28	1.00-1.60	2-6	0.09-0.13	0.0-2.9	0.1-1.0	.15	.43			
	16-28	---	---	0.00-0.2	---	---	---	---	---			
	28-80	16-28	1.00-1.60	2-6	0.06-0.08	0.0-2.9	0.1-0.3	.10	.37			
CVC:												
Costavar----------	0-4	18-27	1.45-1.60	0.2-0.6	0.09-0.13	0.0-2.9	1.0-3.0	.15	.28	1	6	48
	4-13	20-35	1.45-1.65	0.2-0.6	0.05-0.10	0.0-2.9	1.0-2.0	.05	.24			
	13-23	---	---	0.00-0.01	---	---	---	---	---			
Volco----------	0-2	12-25	1.35-1.60	0.6-2	0.07-0.11	0.0-2.9	1.0-3.0	.15	.37	1	6	48
	2-9	12-35	1.40-1.65	0.6-2	0.04-0.06	0.0-2.9	1.0-3.0	.05	.37			
	9-22	---	---	0.00-0.01	---	---	---	---	---			
EEB:												
Espy----------	0-4	7-17	1.30-1.50	0.6-2	0.08-0.15	0.0-2.9	1.0-3.0	.24	.24	1	3	86
	4-16	7-20	1.30-1.50	0.6-2	0.08-0.15	0.0-2.9	1.0-3.0	.32	.32			
	16-22	---	---	0.00-0.2	---	---	---	---	---			
	22-39	7-20	1.30-1.50	0.6-2	0.08-0.15	0.0-2.9	0.1-0.3	.28	.28			
	39-80	2-20	1.55-1.70	0.6-2	0.08-0.15	0.0-2.9	0.1-0.3	.28	.28			
Eppenauer----------	0-5	5-18	1.30-1.60	0.6-2	0.11-0.15	0.0-2.9	2.0-5.0	.24	.24	3	3	86
	5-10	15-30	1.45-1.70	0.6-2	0.12-0.17	0.0-2.9	1.0-3.0	.24	.24			
	10-18	15-30	1.45-1.70	0.6-2	0.12-0.17	0.0-2.9	0.5-2.0	.28	.28			
	18-23	8-18	1.45-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	23-40	---	---	0.06-0.6	---	---	---	---	---			

Table 29.--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					
GAA:												
Galindo----------	0-12	40-60	1.30-1.40	0.06-0.2	0.11-0.17	9.0-15.0	0.5-1.0	.20	.20	5	4	86
	12-29	35-60	1.30-1.40	0.06-0.2	0.11-0.17	9.0-15.0	0.1-0.5	.24	.24			
	29-47	5-20	1.45-1.65	2-6	0.12-0.18	0.0-2.9	0.1-0.5	.49	.49			
	47-80	1-8	1.45-1.65	2-6	0.05-0.08	0.0-2.9	0.1-0.5	.15	.15			
GEF:												
Geefour----------	0-2	40-50	1.35-1.55	0.06-0.2	0.06-0.10	6.0-8.9	0.5-1.0	.10	.32	1	6	48
	2-7	35-50	1.40-1.60	0.06-0.2	0.09-0.13	6.0-8.9	0.5-1.0	.24	.24			
	7-20	35-50	1.80-2.00	0.00-0.2	0.01-0.03	6.0-8.9	0.5-1.0	.32	.32			
Geefour, eroded-----	0-2	40-50	1.40-1.60	0.06-0.2	0.09-0.13	6.0-8.9	0.5-1.0	.32	.32	1	4	86
	2-7	35-50	1.40-1.60	0.06-0.2	0.09-0.13	6.0-8.9	0.5-1.0	.24	.24			
	7-20	35-50	1.80-2.00	0.00-0.2	0.01-0.03	6.0-8.9	0.5-1.0	.32	.32			
GFF:												
Geefour----------	0-11	35-50	1.40-1.60	0.06-0.2	0.09-0.13	6.0-8.9	0.5-1.0	.24	.24	2	4	86
	11-20	35-50	1.80-2.00	0.00-0.2	0.01-0.03	6.0-8.9	0.5-1.0	.24	.24			
Corazones----------	0-9	7-18	1.45-1.60	2-6	0.07-0.10	0.0-2.9	0.5-1.0	.10	.24	5	6	48
	9-48	7-18	1.45-1.65	2-6	0.06-0.08	0.0-2.9	0.3-0.8	.05	.24			
	48-80	10-15	1.45-1.65	2-6	0.05-0.70	0.0-2.9	0.3-0.8	.02	.05			
Ojinaga----------	0-4	15-20	1.00-1.55	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.10	.24	1	6	48
	4-15	15-20	1.00-1.60	2-6	0.06-0.08	0.0-2.9	0.3-0.8	.05	.24			
	15-22	---	---	0.00-0.2	---	---	---	---	---			
	22-49	5-10	1.00-1.60	2-6	0.01-0.03	0.0-2.9	0.3-0.8	.02	.05			
	49-69	5-10	1.00-1.60	2-6	0.02-0.03	0.0-2.9	0.3-0.8	.02	.20			
	69-80	5-10	1.00-1.60	2-6	0.01-0.03	0.0-2.9	0.3-0.8	.02	.05			
GMF:												
Geefour----------	0-5	40-60	1.25-1.45	0.00-0.06	0.08-0.12	6.0-8.9	1.0-1.5	.15	.15	2	4	86
	5-18	40-60	1.35-1.60	0.00-0.06	0.08-0.12	6.0-8.9	0.0-0.5	.24	.24			
	18-28	40-60	1.80-2.00	0.00-0.06	0.01-0.03	6.0-8.9	0.0-0.5	.24	.24			
Melado----------	0-3	40-55	1.35-1.55	0.00-0.06	0.08-0.12	6.0-8.9	0.5-1.0	.32	.32	5	4	86
	3-37	40-55	1.35-1.60	0.00-0.06	0.06-0.10	6.0-8.9	0.5-1.0	.28	.28			
	37-80	40-60	1.35-1.60	0.00-0.06	0.03-0.05	6.0-8.9	0.5-1.0	.32	.32			

Table 29.--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					
GSA:												
Gemelo----------	0-6	12-18	1.40-1.65	2-6	0.07-0.12	0.0-2.9	1.0-2.0	.17	.28	5	5	56
	6-14	10-18	1.40-1.70	2-6	0.08-0.15	0.0-2.9	0.3-0.8	.32	.32			
	14-25	12-18	1.40-1.70	2-6	0.05-0.08	0.0-2.9	0.3-1.0	.05	.24			
	25-36	12-18	1.40-1.70	2-6	0.08-0.15	0.0-2.9	0.3-0.7	.28	.28			
	36-54	12-18	1.40-1.70	2-6	0.05-0.08	0.0-2.9	0.2-0.5	.10	.28			
	54-80	5-15	1.45-1.70	2-6	0.07-0.10	0.0-2.9	0.1-0.5	.10	.20			
Straddlebug---------	0-4	27-40	1.30-1.55	0.2-0.6	0.17-0.21	3.0-5.9	1.0-2.0	.32	.32	2	4L	86
	4-18	27-45	1.30-1.60	0.06-0.6	0.14-0.16	6.0-8.9	0.5-1.0	.20	.20			
	18-26	27-35	1.30-1.70	0.2-0.6	0.17-0.21	3.0-5.9	0.3-0.8	.32	.32			
	26-33	20-35	1.45-1.70	0.2-0.6	0.13-0.18	3.0-5.9	0.3-0.8	.32	.32			
	33-58	10-18	1.40-1.70	2-6	0.08-0.14	0.0-2.9	0.3-0.8	.32	.32			
	58-80	25-35	1.30-1.70	0.2-0.6	0.16-0.20	3.0-5.9	0.3-0.8	.32	.32			
HOB:												
Holguin----------	0-5	8-18	1.30-1.50	2-6	0.06-0.08	0.0-2.9	0.5-2.0	.05	.28	1	6	48
	5-15	---	---	0.00-0.01	---	---	---	---	---			
HOD:												
Horsetrap----------	0-4	20-30	1.35-1.55	0.6-2	0.09-0.13	0.0-2.9	1.0-3.0	.15	.28	1	5	56
	4-13	15-30	1.35-1.60	0.6-2	0.05-0.10	0.0-2.9	1.0-3.0	.10	.28			
	13-23	---	---	0.00-0.01	---	---	---	---	---			
Bofecillos----------	0-4	20-35	1.45-1.60	0.2-0.6	0.05-0.10	0.0-2.9	0.5-2.0	.05	.24	1	7	38
	4-14	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
KIB:												
Kinco----------	0-4	10-18	1.40-1.65	2-6	0.08-0.11	0.0-2.9	0.5-1.0	.10	.15	5	5	56
	4-16	10-18	1.40-1.70	2-6	0.09-0.13	0.0-2.9	0.1-5.0	.15	.15			
	16-26	12-20	1.40-1.70	2-6	0.08-0.11	0.0-2.9	0.1-5.0	.05	.10			
	26-80	12-20	1.40-1.70	2-6	0.09-0.12	0.0-2.9	0.1-5.0	.10	.20			
LGC:												
Lingua----------	0-8	20-30	1.35-1.55	0.6-2	0.07-0.11	0.0-2.9	0.5-2.0	.10	.37	1	8	0
	8-18	---	---	0.00-0.01	---	---	---	---	---			
LIF:												
Lingua----------	0-8	20-35	1.35-1.55	0.2-0.6	0.05-0.10	1.0-4.5	0.5-2.0	.10	.37	1	7	38
	8-18	---	---	0.00-0.01	---	---	---	---	---			

Table 29.--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					
Ohtwo----------	0-8	20-35	1.30-1.60	0.6-2	0.07-0.13	2.9-5.9	1.0-2.0	.10	.32	5	8	0
	8-35	20-35	1.45-1.65	0.6-2	0.07-0.13	2.9-5.9	0.5-2.0	.10	.32			
	35-42	20-35	1.40-1.65	0.6-2	0.07-0.11	1.0-5.9	0.5-1.0	.10	.32			
	42-65	20-35	1.40-1.65	0.6-2	0.07-0.11	1.0-5.9	0.1-0.5	.15	.32			
	65-75	---	---	0.00-0.01	---	---	---	---	---			
MAE:												
Manzanillo----------	0-2	14-20	1.30-1.55	0.6-2	0.07-0.09	0.0-2.9	0.5-2.0	.10	.32	1	6	48
	2-7	15-20	1.60-1.65	0.6-2	0.05-0.07	0.0-2.9	0.5-1.5	.05	.32			
	7-19	---	---	0.00-0.2	---	---	---	---	---			
	19-29	---	---	0.00-0.01	---	---	---	---	---			
Paisano----------	0-3	12-20	1.45-1.60	2-6	0.10-0.14	0.0-2.9	1.0-2.0	.17	.43	1	6	48
	3-12	12-20	1.45-1.60	2-6	0.10-0.14	0.0-2.9	1.0-2.0	.17	.43			
	12-18	---	---	0.00-0.2	---	---	---	---	---			
	18-80	12-25	1.45-1.60	2-6	0.06-0.09	0.0-2.9	0.1-0.5	.05	.15			
MBE:												
Manzanillo----------	0-2	15-21	1.30-1.55	0.6-2	0.08-0.11	0.0-2.9	0.5-2.0	.10	.28	1	5	56
	2-13	18-24	1.60-1.65	0.6-2	0.05-0.07	0.0-2.9	0.5-1.5	.05	.32			
	13-16	---	---	0.00-0.2	---	---	---	---	---			
	16-22	---	---	0.00-0.01	---	---	---	---	---			
Chilicotal----------	0-3	15-27	1.40-1.60	0.6-2	0.05-0.07	0.0-2.9	0.8-2.0	.05	.24	5	8	0
	3-24	18-27	1.40-1.60	0.6-2	0.05-0.07	0.0-2.9	0.2-1.0	.05	.24			
	24-80	18-27	1.40-1.65	0.6-2	0.05-0.07	0.0-2.9	0.1-0.5	.05	.24			
Holguin----------	0-2	12-18	1.30-1.50	2-6	0.06-0.08	0.0-2.9	0.5-2.0	.10	.28	1	6	48
	2-5	12-18	1.45-1.70	2-6	0.04-0.06	0.0-2.9	0.5-1.5	.05	.32			
	5-15	---	---	0.00-0.01	---	---	---	---	---			
MCA:												
Marfa----------	0-4	27-35	1.30-1.50	0.6-2	0.14-0.20	3.0-5.9	1.0-4.0	.28	.28	5	6	48
	4-41	35-50	1.35-1.50	0.2-0.6	0.14-0.20	3.0-5.9	1.0-2.5	.24	.24			
	41-69	10-35	1.35-1.70	0.2-6	0.10-0.20	0.0-5.9	0.5-1.3	.37	.37			
	69-80	2-20	1.40-1.70	0.6-6	0.07-0.18	0.0-2.9	0.5-1.0	.24	.24			
MDE:												
Mariscal----------	0-5	10-27	1.30-1.50	0.6-2	0.07-0.09	0.0-2.9	1.0-2.0	.10	.43	1	8	0
	5-15	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---

Table 29.--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					
MOA:												
Martillo----------	0-4	20-35	1.30-1.60	0.2-0.6	0.13-0.18	3.0-5.9	1.0-3.0	.32	.32	2	6	48
	4-23	40-60	1.35-1.60	0.06-0.2	0.10-0.18	6.0-8.9	1.0-3.0	.20	.20			
	23-80	20-35	1.40-1.65	0.2-0.6	0.08-0.12	3.0-5.9	0.2-0.5	.37	.37			
Butcherknife--------	0-4	27-35	1.25-1.45	0.2-0.6	0.15-0.20	5.9-8.9	1.0-3.0	.43	.43	2	4L	86
	4-22	40-55	1.35-1.60	0.06-0.2	0.12-0.18	5.9-8.9	1.0-3.0	.20	.20			
	22-30	30-45	1.35-1.60	0.06-0.2	0.10-0.16	5.9-8.9	0.1-0.2	.28	.28			
	30-41	20-35	1.45-1.70	0.2-0.6	0.11-0.13	5.9-8.9	0.1-0.2	.37	.37			
	41-80	---	---	0.00-0.06	---	---	---	---	---			
MPB:												
Melado----------	0-4	40-55	1.35-1.55	0.00-0.06	0.04-0.06	6.0-8.9	0.5-1.0	.32	.32	5	4	86
	4-10	40-55	1.35-1.55	0.00-0.06	0.04-0.06	6.0-8.9	0.5-1.0	.32	.32			
	10-44	40-55	1.35-1.55	0.00-0.06	0.06-0.08	6.0-8.9	0.5-1.0	.32	.32			
	44-61	27-40	1.45-1.60	0.2-0.6	0.07-0.09	2.9-5.9	0.5-1.0	.37	.37			
	61-80	40-60	1.35-1.60	0.00-0.06	0.09-0.12	6.0-8.9	0.5-1.0	.28	.28			
Pantera----------	0-2	3-18	1.35-1.55	2-6	0.05-0.08	0.0-2.9	1.0-3.0	.15	.24	5	5	56
	2-9	40-55	1.35-1.60	0.00-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.32	.32			
	9-80	2-12	1.50-1.70	20-40	0.01-0.02	0.0-2.9	0.5-1.0	.02	.05			
MUB:												
Murray----------	0-9	5-20	1.30-1.55	2-6	0.11-0.16	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	9-26	18-35	1.30-1.50	0.6-2	0.10-0.15	0.0-2.9	0.5-2.0	.32	.32			
	26-47	18-35	1.30-1.50	0.6-2	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24			
	47-80	10-35	1.35-1.55	0.6-2	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
Marfa----------	0-4	27-35	1.30-1.50	0.6-2	0.14-0.20	3.0-5.9	1.0-4.0	.28	.28	5	6	48
	4-41	35-50	1.35-1.50	0.2-0.6	0.14-0.20	3.0-5.9	1.0-2.5	.24	.24			
	41-69	10-35	1.35-1.70	0.2-6	0.10-0.20	0.0-5.9	0.5-1.3	.37	.37			
	69-80	2-20	1.40-1.70	0.6-6	0.07-0.18	0.0-2.9	0.5-1.0	.24	.24			
Boracho----------	0-5	10-27	1.40-1.55	0.6-2	0.08-0.12	0.0-2.9	1.0-3.0	.15	.32	1	6	48
	5-10	10-35	1.40-1.55	0.6-2	0.05-0.09	0.0-2.9	0.5-1.5	.10	.37			
	10-25	---	---	0.00-0.2	---	---	---	---	---			
	25-80	10-25	1.45-1.70	2-6	0.03-0.05	0.0-2.9	0.1-0.5	.05	.24			
MZA:												
Musquiz----------	0-7	28-35	1.30-1.55	0.2-0.6	0.14-0.18	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	7-35	35-55	1.35-1.60	0.06-0.2	0.14-0.18	6.0-8.9	1.0-2.0	.24	.24			
	35-80	12-35	1.30-1.70	0.2-0.6	0.10-0.18	3.0-5.9	0.5-1.0	.32	.32			

Table 29.--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					
NLA:												
Nillo----------	0-3	40-55	1.25-1.45	0.06-0.2	0.12-0.18	3.0-5.9	0.5-2.0	.28	.28	3	4	86
	3-26	10-35	1.40-1.65	0.6-2	0.15-0.20	3.0-5.9	0.5-1.0	.49	.49			
	26-80	27-55	1.45-1.70	0.06-0.6	0.15-0.20	3.0-5.9	0.5-1.0	.32	.32			
NPB:												
Nolam----------	0-2	10-20	1.30-1.60	2-6	0.03-0.10	0.0-2.9	0.5-1.0	.15	.24	5	5	56
	2-11	18-35	1.45-1.65	0.6-2	0.03-0.13	2.0-5.9	0.5-1.0	.02	.20			
	11-45	18-35	1.45-1.65	0.6-2	0.03-0.13	2.0-5.9	0.3-0.7	.05	.24			
	45-63	10-25	1.60-1.65	0.6-6	0.03-0.10	0.0-2.9	0.3-0.7	.10	.24			
	63-80	10-25	1.60-1.70	2-6	0.03-0.08	0.0-2.9	0.1-0.5	.10	.24			
Paisano----------	0-4	5-20	1.45-1.60	2-6	0.03-0.05	0.0-2.9	1.0-3.0	.05	.20	1	8	0
	4-13	5-25	1.45-1.60	2-6	0.03-0.06	0.0-2.9	1.0-3.0	.02	.24			
	13-27	---	---	0.00-0.2	---	---	---	---	---			
	27-80	10-25	1.45-1.60	6-20	0.01-0.03	0.0-2.9	0.1-5.0	.02	.05			
PAC:												
Paisano----------	0-3	12-20	1.45-1.60	2-6	0.02-0.04	0.0-2.9	1.0-3.0	.10	.28	1	6	48
	3-8	12-20	1.45-1.60	2-6	0.07-0.11	0.0-2.9	1.0-3.0	.15	.37			
	8-14	---	---	0.00-0.2	---	---	---	---	---			
	14-80	12-25	1.45-1.60	2-6	0.05-0.08	0.0-2.9	0.1-5.0	.05	.10			
PAD:												
Paisano----------	0-3	12-20	1.45-1.60	2-6	0.02-0.04	0.0-2.9	1.0-3.0	.10	.28	1	6	48
	3-8	12-20	1.35-1.60	2-6	0.07-0.11	0.0-2.9	1.0-3.0	.15	.37			
	8-14	---	---	0.00-0.2	---	---	---	---	---			
	14-80	12-25	1.45-1.60	2-6	0.05-0.08	0.0-2.9	0.1-5.0	.05	.10			
PIB:												
Paisano----------	0-3	12-20	1.45-1.60	2-6	0.02-0.04	0.0-2.9	1.0-3.0	.10	.28	1	6	48
	3-8	12-20	1.35-1.60	2-6	0.07-0.11	0.0-2.9	1.0-3.0	.15	.37			
	8-14	---	---	0.00-0.2	---	---	---	---	---			
	14-80	12-25	1.45-1.60	2-6	0.05-0.08	0.0-2.9	0.1-5.0	.05	.10			
Musgrave----------	0-5	35-50	1.30-1.50	0.2-0.6	0.17-0.21	3.0-5.9	1.0-2.0	.28	.28	2	4L	86
	5-18	35-55	1.30-1.70	0.06-0.2	0.13-0.21	3.0-5.9	0.2-0.7	.28	.28			
	18-80	30-55	1.80-2.00	0.00-0.2	0.01-0.03	3.0-5.9	0.0-0.1	.32	.32			
PKD:												
Pantak----------	0-3	25-35	1.45-1.60	0.2-0.6	0.05-0.10	3.0-5.0	0.8-1.5	.10	.28	1	7	38
	3-8	25-35	1.45-1.65	0.2-0.6	0.03-0.06	3.0-5.0	0.3-0.8	.05	.28			
	8-22	---	---	0.00-0.01	---	---	---	---	---			

Table 29.--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					
Lingua----------	0-4	18-35	1.45-1.65	0.2-0.6	0.03-0.06	0.0-5.9	0.5-2.0	.05	.28	1	8	0
	4-14	---	---	0.00-0.01	---	---	---	---	---			
PKE:												
Pantak----------	0-2	18-35	1.45-1.60	0.2-0.6	0.05-0.10	0.0-2.9	0.8-1.5	.10	.28	1	7	38
	2-6	25-35	1.45-1.65	0.2-0.6	0.05-0.10	0.0-2.9	0.3-0.8	.10	.28			
	6-16	---	---	0.00-0.01	---	---	---	---	---			
Lingua----------	0-8	20-30	1.30-1.55	0.6-2	0.04-0.06	0.0-2.9	0.5-2.0	.10	.43	1	8	0
	8-18	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
PTA:												
Phantom----------	0-3	35-40	1.30-1.55	0.2-0.6	0.15-0.20	6.0-8.9	1.0-3.0	.28	.28	5	4	86
	3-27	35-60	1.30-1.60	0.06-0.2	0.12-0.18	6.0-8.9	0.8-2.0	.24	.24			
	27-80	35-60	1.30-1.60	0.06-0.2	0.12-0.18	6.0-8.9	0.5-1.0	.28	.28			
PZB:												
Phantom----------	0-3	40-55	1.25-1.45	0.06-0.2	0.15-0.20	6.0-8.9	1.0-3.0	.20	.20	5	4	86
	3-30	35-60	1.30-1.60	0.06-0.2	0.14-0.20	6.0-8.9	0.5-2.0	.20	.20			
	30-80	35-60	1.30-1.60	0.06-0.2	0.14-0.20	6.0-8.9	0.5-1.0	.24	.24			
Musquiz----------	0-8	28-35	1.30-1.55	0.2-0.6	0.14-0.18	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	8-23	35-55	1.30-1.60	0.06-0.2	0.14-0.18	6.0-8.9	1.0-2.0	.28	.28			
	23-80	12-35	1.35-1.50	0.6-2	0.10-0.18	0.0-2.9	0.5-1.0	.32	.32			
QBE:												
Quadria----------	0-5	20-35	1.35-1.60	0.6-2	0.14-0.19	2.9-5.9	1.0-2.0	.32	.32	2	6	48
	5-17	40-60	1.30-1.50	0.06-0.2	0.12-0.18	5.9-8.9	0.5-1.0	.20	.20			
	17-46	20-45	1.45-1.65	0.2-0.6	0.09-0.11	5.9-8.9	0.5-1.0	.15	.32			
	46-57	5-18	1.50-1.70	2-6	0.09-0.11	2.9-5.9	0.3-0.5	.32	.32			
	57-80	5-18	1.50-1.70	2-6	0.03-0.06	2.9-5.9	0.1-0.5	.10	.24			
Nolam----------	0-5	20-35	1.35-1.60	0.6-2	0.10-0.14	2.9-5.9	0.5-1.0	.20	.37	5	5	56
	5-12	27-45	1.45-1.65	0.2-0.6	0.05-0.07	2.9-5.6	0.5-1.0	.05	.32			
	12-18	30-50	1.30-1.55	0.2-0.6	0.05-0.10	2.9-5.9	0.3-0.7	.05	.20			
	18-48	15-36	1.35-1.60	0.6-2	0.05-0.07	2.9-5.9	0.3-0.7	.05	.49			
	48-80	12-22	1.40-1.65	2-6	0.04-0.06	2.9-5.9	0.1-0.5	.10	.37			
Musgrave----------	0-5	35-50	1.30-1.50	0.2-0.6	0.17-0.21	3.0-5.9	1.0-2.0	.28	.28	2	4L	86
	5-18	35-55	1.30-1.70	0.06-0.2	0.13-0.21	3.0-5.9	0.2-0.7	.28	.28			
	18-80	30-55	1.80-2.00	0.00-0.2	0.01-0.03	3.0-5.9	0.0-0.1	.32	.32			

Table 29.--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					
RCE:												
Redford----------	0-3	16-20	1.00-1.55	2-6	0.05-0.07	0.0-2.9	0.5-1.0	.10	.32	1	6	48
	3-14	8-20	1.00-1.60	2-6	0.07-0.10	0.0-2.9	0.1-1.0	.15	.28			
	14-24	---	---	0.00-0.01	---	---	---	---	---			
Corazones----------	0-3	15-20	1.45-1.60	2-6	0.07-0.09	0.0-2.9	0.5-1.0	.10	.24	5	6	48
	3-48	15-20	1.45-1.65	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.05	.24			
	48-80	10-15	1.45-1.65	2-6	0.05-0.70	0.0-2.9	0.3-0.8	.02	.05			
RCG:												
Redford----------	0-2	16-20	1.00-1.55	2-6	0.05-0.07	0.0-2.9	0.5-1.0	.10	.32	1	6	48
	2-16	8-20	1.00-1.60	2-6	0.06-0.08	0.0-2.9	0.1-1.0	.10	.28			
	16-26	---	---	0.00-0.01	---	---	---	---	---			
Corazones----------	0-6	15-20	1.45-1.60	2-6	0.07-0.09	0.0-2.9	0.5-1.0	.10	.24	5	6	48
	6-48	15-20	1.45-1.65	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.05	.24			
	48-80	10-15	1.45-1.65	2-6	0.05-0.70	0.0-2.9	0.3-0.8	.02	.05			
RED:												
Redlight----------	0-7	8-15	1.50-1.70	0.6-2	0.04-0.06	0.0-2.5	0.8-2.0	.10	.24	1	6	48
	7-15	8-15	1.30-1.60	0.6-2	0.04-0.06	0.0-2.5	0.5-1.0	.10	.32			
	15-25	---	---	0.06-0.2	---	---	---	---	---			
Terlingua----------	0-9	15-20	1.30-1.55	0.6-2	0.04-0.06	0.0-2.9	0.5-2.0	.05	.17	1	6	48
	9-19	---	---	0.06-0.2	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
REE:												
Reduff----------	0-4	20-30	1.35-1.55	0.6-2	0.07-0.11	0.0-2.9	1.0-3.0	.10	.37	1	8	0
	4-15	20-30	1.35-1.55	0.6-2	0.04-0.06	0.0-2.9	0.5-2.0	.10	.37			
	15-25	---	---	0.00-0.06	---	---	---	---	---			
Scotal----------	0-3	18-35	1.45-1.60	0.2-0.6	0.05-0.10	0.0-2.9	1.0-2.0	.05	.17	1	6	48
	3-8	18-35	1.45-1.70	0.2-0.6	0.07-0.13	0.0-2.9	1.0-2.0	.10	.37			
	8-18	---	---	0.00-0.06	---	---	---	---	---			
Holguin----------	0-9	12-20	1.30-1.55	2-6	0.05-0.08	0.0-2.9	0.5-2.0	.10	.37	1	6	48
	9-19	12-22	1.50-1.65	2-6	0.03-0.05	0.0-2.9	0.5-2.0	.05	.32			
	19-29	---	---	0.00-0.06	---	---	---	---	---			

Table 29.--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					
RIA:												
Riverwash----------	---	---	---	---	---	---	---	---	---	-	---	---
Pantera----------	0-3	5-15	1.40-1.60	2-6	0.07-0.10	0.0-2.9	0.1-0.5	.10	.24	5	5	56
	3-80	5-12	1.20-1.50	6-20	0.01-0.03	0.0-2.9	0.1-0.3	.02	.02			
RMB:												
Rockhouse----------	0-13	18-27	1.35-1.50	2-6	0.13-0.18	0.0-2.9	1.0-2.0	.24	.24	3	6	48
	13-80	14-20	1.50-1.65	2-6	0.06-0.09	0.0-2.9	0.5-1.0	.05	.20			
Medley----------	0-6	18-27	1.40-1.55	0.6-2	0.09-0.13	0.0-2.9	1.0-3.0	.10	.20	5	6	48
	6-22	18-35	1.40-1.55	0.6-2	0.11-0.15	0.0-2.9	1.0-2.0	.20	.20			
	22-58	18-35	1.40-1.55	0.6-2	0.12-0.16	0.0-2.9	0.5-1.0	.32	.32			
	58-80	18-35	1.45-1.60	0.6-2	0.12-0.16	0.0-2.9	0.5-1.0	.20	.32			
SCB:												
Sanmoss----------	0-3	15-25	1.40-1.55	0.6-2	0.09-0.13	0.0-2.9	2.0-3.0	.10	.32	5	8	0
	3-12	15-30	1.40-1.55	0.6-2	0.09-0.13	0.0-2.9	1.0-3.0	.15	.32			
	12-40	15-30	1.40-1.55	0.6-2	0.09-0.13	0.0-2.9	1.0-3.0	.10	.32			
	40-55	15-30	1.40-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.5	.15	.37			
	55-80	10-25	1.35-1.60	2-6	0.05-0.09	0.0-2.9	0.3-1.0	.05	.10			
Medley----------	0-11	15-27	1.30-1.55	2-6	0.12-0.16	0.0-2.9	1.0-3.0	.20	.32	5	6	48
	11-25	15-35	1.40-1.55	2-6	0.08-0.11	0.0-2.9	1.0-2.0	.15	.24			
	25-80	18-35	1.30-1.70	0.6-2	0.12-0.16	3.0-5.9	0.5-1.0	.20	.32			
SDC:												
Sauceda----------	0-2	10-25	1.30-1.55	0.6-2	0.07-0.11	0.0-2.9	0.5-2.0	.10	.37	1	8	0
	2-8	18-25	1.40-1.60	0.6-2	0.07-0.11	0.0-2.9	0.5-2.0	.10	.43			
	8-22	---	---	0.00-0.01	---	---	---	---	---			
Boludo----------	0-4	20-35	1.30-1.60	0.2-0.6	0.07-0.13	2.0-5.9	2.0-5.0	.15	.32	1	6	48
	4-11	20-35	1.45-1.65	0.2-0.6	0.07-0.13	2.0-5.9	1.0-3.0	.10	.37			
	11-17	---	---	0.06-0.6	---	---	---	---	---			
	17-27	---	---	0.00-0.01	---	---	---	---	---			
SEE:												
Sauceda----------	0-2	10-25	1.30-1.55	0.6-2	0.07-0.11	0.0-2.9	0.5-2.0	.10	.37	1	8	0
	2-8	18-25	1.40-1.60	0.6-2	0.07-0.11	0.0-2.9	0.5-2.0	.10	.43			
	8-22	---	---	0.00-0.01	---	---	---	---	---			

Table 29.--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					
Decoty----------	0-5	8-18	1.35-1.60	2-6	0.02-0.04	0.0-2.9	1.0-3.0	.15	.43	1	6	48
	5-14	8-18	1.35-1.60	2-6	0.03-0.05	0.0-2.9	1.0-3.0	.10	.49			
	14-24	---	---	0.00-0.01	---	---	---	---	---			
SHC:												
Scotal----------	0-3	18-35	1.45-1.60	0.6-2	0.05-0.10	0.0-2.9	1.0-2.0	.05	.17	1	6	48
	3-8	18-35	1.45-1.70	0.6-2	0.07-0.10	0.0-2.9	1.0-2.0	.15	.37			
	8-24	---	---	0.00-0.01	---	---	---	---	---			
Holguin----------	0-9	12-18	1.30-1.55	2-6	0.05-0.08	0.0-2.9	0.5-2.0	.10	.37	1	6	48
	9-19	12-18	1.50-1.65	2-6	0.03-0.05	0.0-2.9	0.5-2.0	.05	.32			
	19-29	---	---	0.00-0.01	---	---	---	---	---			
SHE:												
Scotal----------	0-2	10-27	1.30-1.55	0.6-2	0.08-0.11	0.0-2.9	0.5-1.5	.15	.49	1	6	48
	2-7	10-27	1.30-1.55	0.6-2	0.05-0.07	0.0-2.9	0.3-1.0	.05	.43			
	7-17	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
SIG:												
Scotal----------	0-3	18-35	1.30-1.60	0.6-2	0.07-0.09	0.0-2.9	1.0-2.0	.05	.17	1	6	48
	3-8	18-35	1.45-1.70	0.6-2	0.08-0.11	0.0-2.9	0.5-1.5	.10	.37			
	8-18	---	---	0.00-0.01	---	---	---	---	---			
Ohtwo----------	0-8	20-35	1.30-1.60	0.6-2	0.09-0.13	2.9-5.9	1.0-2.0	.10	.24	5	8	0
	8-35	20-35	1.45-1.70	0.6-2	0.09-0.13	2.9-5.9	0.5-2.0	.10	.32			
	35-42	20-35	1.40-1.65	0.6-2	0.08-0.11	0.0-2.9	0.5-1.0	.10	.32			
	42-65	20-35	1.40-1.65	0.6-2	0.09-0.13	0.0-2.9	0.1-0.5	.15	.32			
	65-80	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
SRA:												
Straddlebug---------	0-4	27-40	1.30-1.55	0.2-0.6	0.17-0.21	3.0-5.9	1.0-2.0	.32	.32	2	4L	86
	4-18	27-45	1.30-1.60	0.06-0.6	0.14-0.16	6.0-8.9	0.5-1.0	.20	.20			
	18-26	27-35	1.30-1.70	0.2-0.6	0.17-0.21	3.0-5.9	0.3-0.8	.32	.32			
	26-33	20-35	1.45-1.70	0.2-0.6	0.13-0.18	3.0-5.9	0.3-0.8	.32	.32			
	33-58	10-18	1.40-1.70	2-6	0.08-0.14	0.0-2.9	0.3-0.8	.32	.32			
	58-80	25-35	1.30-1.70	0.2-0.6	0.16-0.20	3.0-5.9	0.3-0.8	.32	.32			

Table 29.--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					
STE:												
Strawhouse----------	0-3	7-20	1.30-1.50	0.6-2	0.06-0.09	0.0-2.9	0.5-1.0	.15	.37	1	6	48
	3-7	10-27	1.30-1.50	0.6-2	0.09-0.13	0.0-2.9	0.1-0.5	.15	.43			
	7-28	---	---	0.00-0.2	---	---	---	---	---			
	28-80	20-27	1.35-1.55	0.6-2	0.06-0.08	0.0-2.9	0.0-0.3	.05	.24			
Stillwell----------	0-7	6-18	1.45-1.65	0.6-2	0.04-0.06	0.0-2.9	0.5-2.0	.05	.20	5	6	48
	7-25	7-18	1.45-1.65	0.6-2	0.07-0.09	0.0-2.9	0.1-0.5	.10	.32			
	25-80	7-18	1.50-1.70	0.6-2	0.02-0.04	0.0-2.9	0.1-0.5	.02	.17			
SUD:												
Studybutte----------	0-5	20-32	1.40-1.60	0.6-2	0.05-0.10	0.0-2.9	0.5-2.0	.05	.28	1	6	48
	5-10	15-32	1.40-1.60	0.6-2	0.03-0.10	0.0-2.9	0.5-2.0	.05	.28			
	10-20	---	---	0.00-0.01	---	---	---	---	---			
SUE:												
Studybutte----------	0-3	5-25	1.40-1.60	2-6	0.05-0.10	0.0-2.9	0.5-2.0	.15	.43	1	7	38
	3-6	5-25	1.40-1.60	2-6	0.03-0.10	0.0-2.9	0.5-2.0	.05	.43			
	6-16	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
SUG:												
Studybutte----------	0-3	5-25	1.40-1.60	2-6	0.05-0.10	0.0-2.9	0.5-2.0	.15	.43	1	7	38
	3-6	5-25	1.40-1.60	2-6	0.03-0.10	0.0-2.9	0.5-2.0	.05	.43			
	6-16	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
TEA:												
Tenneco----------	0-3	18-30	1.30-1.60	0.6-2	0.15-0.22	3.0-5.9	0.5-1.0	.43	.43	5	4L	86
	3-28	18-35	1.30-1.55	0.6-2	0.15-0.22	3.0-5.9	0.5-1.0	.43	.43			
	28-80	10-45	1.45-1.65	0.2-0.6	0.12-0.17	3.0-5.9	0.5-1.0	.20	.32			
Bodecker----------	0-8	10-25	1.35-1.60	0.6-2	0.13-0.20	0.0-2.9	0.5-2.0	.37	.37	5	4L	86
	8-14	10-30	1.40-1.65	0.6-2	0.13-0.20	0.0-5.9	0.5-1.0	.37	.37			
	14-35	3-20	1.40-1.65	2-20	0.02-0.08	0.0-5.9	0.5-1.0	.02	.02			
	35-80	10-35	1.45-1.65	0.2-6	0.09-0.13	2.0-5.9	0.5-1.0	.10	.24			

Table 29.--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					
TRE:												
Terlingua----------	0-9	5-20	1.45-1.65	2-6	0.06-0.08	0.0-2.9	0.5-2.0	.10	.32	1	8	0
	9-19	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
TRG:												
Terlingua----------	0-13	5-15	1.40-1.60	2-6	0.03-0.06	0.0-2.9	0.5-1.0	.10	.28	1	6	48
	13-23	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
VAA:												
Verhalen----------	0-7	35-60	1.25-1.45	0.00-0.06	0.12-0.17	6.0-8.9	1.0-2.0	.28	.28	5	4	86
	7-54	35-60	1.30-1.55	0.00-0.06	0.12-0.17	6.0-8.9	0.5-2.0	.32	.32			
	54-80	35-60	1.25-1.45	0.00-0.06	0.14-0.16	6.0-8.9	0.5-1.0	.28	.28			
VCA:												
Vicente----------	0-9	18-27	1.45-1.55	0.2-0.6	0.15-0.20	3.0-5.9	0.8-1.0	.49	.49	5	4L	86
	9-80	10-18	1.40-1.50	0.6-2	0.15-0.20	0.0-2.9	0.3-0.8	.55	.55			
Lomapelona----------	0-11	10-28	1.50-1.60	0.6-2	0.14-0.19	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	11-80	10-20	1.30-1.60	0.2-0.6	0.12-0.18	0.0-2.9	0.3-0.8	.55	.55			
Castolon----------	0-11	30-40	1.25-1.35	0.2-0.6	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43	5	4L	86
	11-23	25-40	1.25-1.35	0.2-0.6	0.16-0.24	3.0-5.9	0.3-0.8	.43	.43			
	23-80	25-50	1.20-1.30	0.2-0.6	0.16-0.24	3.0-5.9	0.3-0.8	.49	.49			
VOC:												
Volco----------	0-5	12-25	1.35-1.60	0.6-2	0.07-0.11	0.0-2.9	1.0-3.0	.15	.37	1	6	48
	5-18	12-35	1.35-1.60	0.6-2	0.07-0.11	0.0-2.9	1.0-3.0	.10	.37			
	18-28	---	---	0.00-0.01	---	---	---	---	---			
Pardo----------	0-5	25-35	1.30-1.55	0.2-0.6	0.12-0.17	3.0-5.9	2.0-5.0	.17	.28	1	5	56
	5-15	20-35	1.30-1.70	0.2-0.6	0.07-0.13	3.0-5.9	1.0-3.0	.10	.37			
	15-18	---	---	0.00-0.2	---	---	---	---	---			
	18-28	---	---	0.00-0.01	---	---	---	---	---			
W:												
Water----------	---	---	---	---	---	---	---	---	---	-	---	---

Table 30.--Chemical Soil Properties

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
ALB:							
Altar----------	0-10	8.6-20	6.6-7.8	0-1	0	0.0-2.0	0
	10-26	10-23	7.4-8.4	1-5	0	0.0-2.0	0
	26-80	7.9-23	7.4-8.4	1-15	0	0.0-2.0	0
Bodecker----------	0-5	2.0-13	7.9-9.0	1-10	0	0.0-2.0	0
	5-30	2.0-8.9	7.9-9.0	1-10	0	0.0-2.0	0
	30-80	1.8-7.8	7.9-9.0	1-10	0	0.0-2.0	0
Riverwash----------	---	---	---	---	---	---	---
ANS:							
Area not surveyed----	---	---	---	---	---	---	---
BAC:							
Baviza----------	0-3	1.0-7.8	7.4-9.0	1-5	0-1	0.0-2.0	0
	3-29	1.8-6.4	7.4-9.0	2-10	0-3	0.0-2.0	0
	29-80	0.9-4.2	7.4-9.0	2-10	0-5	0.0-4.0	0
Pantera----------	0-2	0.9-4.0	7.9-9.0	2-5	0	0.0-2.0	0
	2-80	0.9-3.9	7.9-9.0	4-10	0	0.0-4.0	0
BEB:							
Berrend----------	0-2	13-21	6.6-7.8	0-10	0	0.0-2.0	0
	2-19	13-29	7.4-8.4	0-10	0	0.0-2.0	0
	19-38	13-28	7.4-8.4	5-25	0	0.0-2.0	0
	38-60	13-23	7.9-8.4	10-30	0	0.0-2.0	0
	60-80	8.6-16	7.9-8.4	5-20	0	0.0-2.0	0
Espy----------	0-4	6.4-15	7.4-8.4	0-3	0	0.0-2.0	0
	4-12	6.4-17	7.4-8.4	5-25	0	0.0-2.0	0
	12-18	---	---	---	---	---	---
	18-80	10-16	7.9-8.4	40-75	0	0.0-2.0	0-3
BIC:							
Bissett----------	0-2	13-34	7.9-8.4	40-80	0	0.0-2.0	0
	2-9	12-34	7.9-8.4	40-80	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BIE:							
Bissett----------	0-2	13-34	7.9-8.4	40-80	0	0.0-2.0	0
	2-9	12-34	7.9-8.4	40-80	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BIG:							
Bissett----------	0-2	13-34	7.9-8.4	40-80	0	0.0-2.0	0
	2-9	12-34	7.9-8.4	40-80	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
BLE:							
Blackgap----------	0-4	8.6-24	7.9-8.4	40-80	0	0.0-2.0	0
	4-9	11-22	7.9-8.4	40-80	0	0.0-2.0	0
	9-20	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BLG:							
Blackgap----------	0-4	8.6-24	7.9-8.4	40-80	0	0.0-2.0	0
	4-9	11-22	7.9-8.4	40-80	0	0.0-2.0	0
	9-20	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BNE:							
Bofecillos----------	0-3	16-28	6.6-8.4	0-2	0	0	0
	3-13	---	---	---	---	---	---
Horsetrap----------	0-3	15-25	6.6-7.8	0-15	0	0.0-2.0	0
	3-16	13-25	7.4-8.4	5-20	0	0.0-2.0	0
	16-26	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BNG:							
Bofecillos	0-6	15-24	6.6-8.4	0-2	0	0.0-2.0	0
	6-16	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BOB:							
Boracho----------	0-7	15-23	7.4-8.4	2-20	0	0.0-2.0	0
	7-15	8.6-28	7.9-8.4	2-20	0	0.0-2.0	0
	15-19	---	---	---	---	---	---
	19-80	8.1-20	7.9-8.4	15-50	0	0.0-2.0	0-3
Espy----------	0-6	15-25	7.4-8.4	0-3	0	0.0-2.0	0
	6-17	15-25	7.4-8.4	5-25	0	0.0-2.0	0
	17-24	---	---	---	---	---	---
	24-80	14-21	7.9-8.4	40-75	0	0.0-2.0	0-3
BOC:							
Borunda----------	0-3	15-25	7.4-8.4	5-20	0	0.0-2.0	0-10
	3-12	23-41	7.9-9.0	15-40	0-5	2.0-8.0	15-40
	12-28	6.5-24	7.9-9.0	15-40	5-20	8.0-16.0	15-40
	28-40	---	---	---	---	---	---
	40-62	---	---	---	---	---	---
Borunda, gravelly----	0-5	21-32	7.4-8.4	5-20	0	0.0-2.0	0-10
	5-12	23-41	7.9-9.0	5-20	0-5	0.0-8.0	15-40
	12-30	6.5-24	7.9-9.0	15-40	5-20	8.0-16.0	15-40
	30-40	---	---	---	---	---	---
	40-62	---	---	---	---	---	---
BRD:							
Brewster----------	0-4	15-29	6.6-7.3	0-5	0	0	0
	4-14	---	---	---	---	---	---

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
BRF:							
Brewster	0-4	15-29	6.6-7.3	0-5	0	0	0
	4-14	---	---	---	---	---	---
Rock outcrop	0-10	---	---	---	---	---	---
BRG:							
Brewster	0-11	15-29	6.6-7.3	0-5	0	0	0
	11-20	---	---	---	---	---	---
Rock outcrop	0-10	---	---	---	---	---	---
BUD:							
Buckear	0-7	8.6-22	7.4-8.4	0-10	0	0.0-2.0	0
	7-24	---	---	---	---	---	---
Coyanosa	0-7	10-18	6.6-8.4	0-2	0	0.0-2.0	0
	7-17	---	---	---	---	---	---
CAA:							
Castolon	0-11	23-31	7.9-8.4	5-15	0-3	0.0-8.0	0-6
	11-23	19-31	7.9-8.4	5-15	0-3	0.0-8.0	0-6
	23-80	19-38	7.9-8.4	5-15	0-3	0.0-8.0	0-6
CAG:							
Catto	0-7	11-19	6.1-7.3	0-1	0	0.0-2.0	0
	7-17	---	---	---	---	---	---
Buckear	0-13	8.6-22	7.4-8.4	0-10	0	0.0-2.0	0
	13-24	---	---	---	---	---	---
Rock outcrop	0-10	---	---	---	---	---	---
CIC:							
Chilicotal	0-2	10-21	7.9-8.4	2-15	0	0.0-2.0	0-2
	2-40	8.3-22	7.9-8.4	15-25	0	0.0-2.0	4-10
	40-80	4.3-21	7.9-9.0	15-25	0-5	0.0-4.0	4-13
CID:							
Chilicotal	0-2	10-21	7.9-8.4	2-15	0	0.0-2.0	0-2
	2-40	8.3-22	7.9-8.4	15-25	0	0.0-2.0	4-10
	40-80	4.3-21	7.9-9.0	15-25	0-5	0.0-4.0	4-13
CLC:							
Chilicotal	0-9	10-21	7.9-8.4	2-15	0	0.0-2.0	0-2
	9-16	8.3-22	7.9-8.4	15-25	0	0.0-2.0	4-10
	16-80	8.1-21	7.9-9.0	15-25	0-5	0.0-4.0	4-13
Paisano	0-5	9.4-19	7.4-8.4	15-40	0	0.0-2.0	0
	5-18	9.4-19	7.9-8.4	40-60	0	0.0-2.0	0
	18-31	---	---	---	---	---	---
	31-80	5.3-26	7.9-8.4	40-75	0	0.0-2.0	0-3
CMC:							
Chilimol	0-10	8.9-23	7.9-8.4	0-5	0	0.0-2.0	0
	10-80	12-25	7.9-8.4	5-25	0	0.0-2.0	0

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
Boracho----------	0-6	8.9-17	7.4-8.4	2-20	0	0.0-2.0	0
	6-12	8.6-28	7.9-8.4	2-20	0	0.0-2.0	0
	12-25	---	---	---	---	---	---
	25-80	8.1-20	7.9-8.4	15-50	0	0.0-2.0	0-3
Berrend----------	0-2	13-21	6.6-7.8	0-10	0	0.0-2.0	0
	2-19	13-29	7.4-8.4	0-10	0	0.0-2.0	0
	19-51	13-28	7.4-8.4	5-25	0	0.0-2.0	0
	51-80	8.6-16	7.9-8.4	5-20	0	0.0-2.0	0
CND:							
Chinati----------	0-3	8.9-21	7.4-7.8	0-5	0	0.0-2.0	0
	3-12	15-28	7.4-8.4	0-15	0	0.0-2.0	0
	12-21	---	---	---	---	---	---
	21-47	---	---	---	---	---	---
Boracho----------	0-4	22-29	7.4-8.4	2-20	0	0.0-2.0	0
	4-12	8.6-28	7.9-8.4	2-20	0	0.0-2.0	0
	12-25	---	---	---	---	---	---
	25-80	8.1-20	7.9-8.4	15-50	0	0.0-2.0	0-3
Berrend----------	0-4	13-21	6.6-7.8	0-10	0	0.0-2.0	0
	4-20	13-29	7.4-8.4	0-10	0	0.0-2.0	0
	20-39	13-23	7.4-8.4	10-30	0	0.0-2.0	0
	39-80	8.6-16	7.9-8.4	5-20	0	0.0-2.0	0
CNE:							
Chinati----------	0-5	8.9-17	7.4-7.8	0-5	0	0.0-2.0	0
	5-9	15-28	7.4-8.4	0-15	0	0.0-2.0	0
	9-29	---	---	---	---	---	---
	29-40	---	---	---	---	---	---
Boracho----------	0-9	8.9-23	7.4-8.4	2-20	0	0.0-2.0	0
	9-20	---	---	---	---	---	---
	20-80	8.1-20	7.9-8.4	15-50	0	0.0-2.0	0-3
COC:							
Corazones----------	0-2	6.3-15	7.9-8.4	5-15	0	0.0-2.0	0
	2-25	6.3-15	7.9-8.4	15-30	0	0.0-2.0	0-2
	25-80	2.8-8.8	7.9-8.4	15-30	0	0.0-4.0	0-8
Ojinaga----------	0-6	13-17	7.9-9.0	2-15	0	0.0-2.0	0-2
	6-12	12-16	7.9-9.0	5-40	0	0.0-2.0	0-2
	12-22	---	---	---	---	---	---
	22-49	3.8-8.8	7.9-9.0	5-20	0-1	0.0-8.0	0-10
	49-69	3.8-8.8	7.9-9.0	5-20	0-1	2.0-16.0	7-25
	69-80	3.8-8.8	7.9-9.0	1-15	0-1	2.0-16.0	5-25
COE:							
Corazones----------	0-3	13-17	7.9-8.4	5-15	0	0.0-2.0	0
	3-43	13-17	7.9-8.4	15-30	0	0.0-2.0	0-2
	43-80	8.4-13	7.9-8.4	15-30	0	0.0-4.0	0-8
Ojinaga----------	0-2	13-23	7.9-9.0	2-15	0	0.0-2.0	0-2
	2-16	12-23	7.9-9.0	5-40	0	0.0-2.0	0-2
	16-28	---	---	---	---	---	---
	28-80	12-21	7.9-9.0	15-40	0-1	0.0-8.0	0-10

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
CVC:							
Costavar	0-4	15-23	6.6-7.8	0-5	0	0.0-2.0	0
	4-13	17-28	6.6-7.8	0-10	0	0.0-2.0	0
	13-23	---	---	---	---	---	---
Volco	0-2	11-21	7.4-8.4	5-15	0	0.0-2.0	0
	2-9	11-29	7.4-8.4	20-35	0	0.0-2.0	0
	9-22	---	---	---	---	---	---
EEB:							
Espy	0-4	6.4-15	7.4-8.4	0-3	0	0.0-2.0	0
	4-16	6.4-17	7.4-8.4	5-25	0	0.0-2.0	0
	16-22	---	---	---	---	---	---
	22-39	5.9-16	7.9-8.4	5-25	0	0.0-2.0	0
	39-80	1.9-16	7.9-8.4	1-10	0	0.0-2.0	0
Eppenauer	0-5	4.9-16	7.4-8.4	0-5	0	0.0-2.0	0
	5-10	13-25	7.4-8.4	0-5	0	0.0-2.0	0
	10-18	13-25	7.9-8.4	1-5	0	0.0-2.0	0
	18-23	7.1-15	7.9-8.4	5-15	0	0.0-2.0	0
	23-40	---	---	---	---	---	---
GAA:							
Galindo	0-12	30-45	7.4-8.4	1-5	0-2	0.0-16.0	2-8
	12-29	25-44	7.4-8.4	1-5	0-2	0.0-16.0	2-8
	29-47	4.3-16	7.4-8.4	1-5	0-2	0.0-16.0	2-8
	47-80	4.1-7.1	7.4-8.4	1-5	0-2	0.0-16.0	2-8
GEF:							
Geefour	0-2	29-37	7.9-9.0	1-10	0-2	4.0-16.0	2-13
	2-7	26-37	7.9-9.0	1-10	0-2	16.0-32.0	2-13
	7-20	26-37	7.9-9.0	0-10	0-2	16.0-32.0	2-13
Geefour, eroded	0-2	29-37	7.9-9.0	1-10	0-2	4.0-32.0	2-13
	2-7	26-37	7.9-9.0	1-10	0-2	16.0-32.0	2-13
	7-20	26-37	7.9-9.0	0-10	0-2	16.0-32.0	2-13
GFF:							
Geefour	0-11	26-37	7.9-9.0	1-10	0-2	4.0-32.0	2-13
	11-20	26-37	7.9-9.0	0-10	0-2	16.0-32.0	2-13
Corazones	0-9	6.3-15	7.9-8.4	5-15	0	0.0-2.0	0
	9-48	6.1-15	7.9-8.4	15-30	0	0.0-2.0	0-2
	48-80	8.4-13	7.9-8.4	15-30	0	0.0-4.0	0-8
Ojinaga	0-4	13-17	7.9-9.0	2-15	0	0.0-2.0	0-2
	4-15	12-16	7.9-9.0	5-40	0	0.0-2.0	0-2
	15-22	---	---	---	---	---	---
	22-49	3.8-8.8	7.9-9.0	5-20	0-1	0.0-8.0	0-10
	49-69	3.8-8.8	7.9-9.0	5-20	0-1	2.0-16.0	7-25
	69-80	3.8-8.8	7.9-9.0	1-15	0-1	2.0-16.0	5-25
GMF:							
Geefour	0-5	30-43	7.9-9.0	1-5	1-5	8.0-20.0	15-24
	5-18	20-37	7.9-9.0	1-15	2-15	10.0-20.0	45-70
	18-28	20-37	7.9-9.0	1-15	2-15	8.0-20.0	45-70
Melado	0-3	29-40	7.9-8.4	1-15	0-5	0.0-40.0	0-60
	3-37	29-40	7.9-9.0	1-15	0-6	5.0-40.0	13-60
	37-80	29-43	7.9-9.0	1-15	1-5	10.0-40.0	13-60

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
GSA:							
Gemelo----------	0-6	11-16	7.9-9.0	1-4	0	0.0-2.0	1-5
	6-14	8.4-15	7.9-9.0	1-4	0	0.0-2.0	1-15
	14-25	10-15	7.9-9.0	1-4	0	0.0-4.0	5-15
	25-36	10-15	7.9-9.0	1-4	0	0.0-4.0	5-15
	36-54	8.7-15	7.9-9.5	1-5	0	1.0-6.0	13-50
	54-80	4.3-13	7.9-9.5	1-4	0	1.0-6.0	13-50
Straddlebug----------	0-4	22-32	7.9-9.0	1-10	0	0.0-2.0	1-5
	4-18	21-35	7.9-9.0	5-15	0	0.0-2.0	10-20
	18-26	20-27	7.9-9.0	2-15	0	2.0-4.0	20-35
	26-33	15-27	7.9-9.0	2-15	0	2.0-4.0	20-35
	33-58	8.4-15	7.9-9.0	2-15	0	2.0-4.0	20-35
	58-80	19-27	7.9-9.0	2-15	0	2.0-4.0	20-35
HOB:							
Holguin----------	0-5	7.3-16	7.4-8.4	1-15	0	0.0-2.0	0
	5-15	---	---	---	---	---	---
HOD:							
Horsetrap----------	0-4	17-25	6.6-7.8	0-15	0	0.0-2.0	0
	4-13	13-25	7.4-8.4	5-20	0	0.0-2.0	0
	13-23	---	---	---	---	---	---
Bofecillos----------	0-4	16-28	6.6-8.4	0-5	0	0	0
	4-14	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
KIB:							
Kinco----------	0-4	8.6-15	7.9-8.4	5-15	0	0.0-2.0	0
	4-16	8.1-16	7.9-8.4	5-15	0	0.0-2.0	0
	16-26	9.6-18	7.9-8.4	15-35	0	0.0-2.0	0
	26-80	9.6-18	7.9-8.4	15-35	0	0.0-2.0	0
LGC:							
Lingua----------	0-8	16-25	6.6-7.8	0-1	0	0	0
	8-18	---	---	---	---	---	---
LIF:							
Lingua----------	0-8	16-28	6.6-7.8	0-1	0	0	0
	8-18	---	---	---	---	---	---
Ohtwo----------	0-8	17-28	7.4-8.4	0-2	0	0.0-2.0	0-1
	8-35	16-28	7.4-8.4	0-5	0	0.0-2.0	0-1
	35-42	16-28	7.4-8.4	0-10	0	0.0-2.0	0-1
	42-65	15-27	7.4-8.4	0-10	0	0.0-2.0	0-1
	65-75	---	---	---	---	---	---
MAE:							
Manzanillo----------	0-2	12-17	7.4-8.4	5-20	0	0.0-2.0	0
	2-7	13-17	7.9-8.4	15-25	0	0.0-2.0	0
	7-19	---	---	---	---	---	---
	19-29	---	---	---	---	---	---
Paisano----------	0-3	9.4-17	7.4-8.4	15-40	0	0.0-2.0	0
	3-12	9.4-17	7.9-8.4	40-60	0	0.0-2.0	0
	12-18	---	---	---	---	---	---
	18-80	5.3-15	7.9-8.4	40-75	0	0.0-2.0	0-3

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
MBE:							
Manzanillo----------	0-2	13-18	7.4-8.4	5-20	0	0.0-2.0	0
	2-13	15-20	7.9-8.4	15-25	0	0.0-2.0	0
	13-16	---	---	---	---	---	---
	16-22	---	---	---	---	---	---
Chilicotal----------	0-3	13-22	7.9-8.4	2-15	0	0.0-2.0	0-2
	3-24	14-22	7.9-8.4	15-25	0	0.0-2.0	4-10
	24-80	14-21	7.9-9.0	15-25	0-5	0.0-4.0	4-13
Holguin----------	0-2	11-16	7.4-8.4	1-15	0	0.0-2.0	0
	2-5	10-15	7.4-8.4	1-15	0	0.0-2.0	0
	5-15	---	---	---	---	---	---
MCA:							
Marfa----------	0-4	22-29	6.1-7.3	0	0-5	0.0-2.0	0
	4-41	28-39	6.6-7.8	0-2	0-5	0.0-2.0	0
	41-69	8.6-28	7.4-8.4	1-10	0-5	0.0-2.0	0
	69-80	2.0-17	7.9-8.4	5-15	0-5	0.0-4.0	0
MDE:							
Mariscal----------	0-5	8.1-22	7.9-8.4	40-70	0	0.0-2.0	0
	5-15	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
MOA:							
Martillo----------	0-4	17-29	7.9-8.4	1-10	0	0.0-8.0	0-12
	4-23	31-47	7.9-9.0	2-15	0-2	2.0-8.0	15-50
	23-80	15-27	7.9-9.0	2-15	0-5	4.0-16.0	25-65
Butcherknife---------	0-4	22-29	7.4-8.4	1-10	0-2	0.0-2.0	5-10
	4-22	31-43	7.4-9.0	5-15	0-5	2.0-8.0	15-40
	22-30	16-25	7.9-9.0	5-15	5-25	4.0-16.0	15-40
	30-41	8.1-14	7.9-9.0	20-40	10-25	8.0-16.0	25-40
	41-80	---	---	---	---	---	---
MPB:							
Melado----------	0-4	29-40	7.9-8.4	1-15	0-5	0.0-40.0	0-60
	4-10	29-40	7.9-8.4	1-15	0-5	5.0-40.0	0-60
	10-44	29-40	7.9-9.0	1-15	0-6	5.0-40.0	13-60
	44-61	21-30	7.9-9.0	1-15	0-6	5.0-40.0	40-60
	61-80	29-43	7.9-9.0	1-15	0-5	10.0-40.0	13-60
Pantera----------	0-2	3.1-14	7.4-8.4	1-15	0-5	0.0-4.0	0-8
	2-9	15-32	7.9-8.4	1-15	5-12	0.0-4.0	0-8
	9-80	1.2-9.4	7.9-8.4	1-10	1-10	0.0-4.0	0-8
MUB:							
Murray----------	0-9	4.8-17	7.4-8.4	0-15	0	0.0-2.0	0
	9-26	13-28	7.4-8.4	10-30	0	0.0-2.0	0
	26-47	14-28	7.4-8.4	10-30	0	0.0-2.0	0
	47-80	8.1-27	7.4-8.4	5-20	0	0.0-2.0	0
Marfa----------	0-4	22-29	6.1-7.3	0	0-5	0.0-2.0	0
	4-41	28-39	6.6-7.8	0-2	0-5	0.0-2.0	0
	41-69	8.6-28	7.4-8.4	1-10	0-5	0.0-2.0	0
	69-80	2.0-17	7.9-8.4	5-15	0-5	0.0-4.0	0

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
Boracho----------	0-5	8.9-23	7.4-8.4	2-20	0	0.0-2.0	0
	5-10	8.6-28	7.9-8.4	2-20	0	0.0-2.0	0
	10-25	---	---	---	---	---	---
	25-80	8.1-20	7.9-8.4	15-50	0	0.0-2.0	0-3
MZA:							
Musquiz----------	0-7	23-29	6.6-7.8	0-5	0	0.0-1.0	0
	7-35	28-42	6.6-7.8	0-10	0	0.0-2.0	0
	35-80	10-28	7.9-8.4	15-25	0	0.0-2.0	0
NLA:							
Nillo----------	0-3	30-42	7.9-8.4	0-10	0	0.0-2.0	0-5
	3-26	8.6-28	7.9-8.4	0-10	0	0.0-4.0	0-15
	26-80	20-41	8.5-9.0	0-15	0	0.0-4.0	15-25
NPB:							
Nolam----------	0-2	8.6-17	7.4-8.4	1-10	0	0.0-2.0	0
	2-11	15-28	7.4-8.4	5-15	0	0.0-2.0	0
	11-45	14-27	7.9-8.4	15-25	0-2	0.0-2.0	0
	45-63	8.5-20	7.9-9.0	15-40	0-2	0.0-2.0	0
	63-80	8.1-20	7.9-9.0	10-35	0-2	0.0-2.0	0
Paisano----------	0-4	4.6-19	7.9-8.4	15-40	0	0.0-2.0	0
	4-13	4.6-23	7.9-8.4	40-60	0	0.0-2.0	0
	13-27	---	---	---	---	---	---
	27-80	4.5-26	7.9-8.4	40-75	0	0.0-2.0	0-1
PAC:							
Paisano----------	0-3	9.4-19	7.9-8.4	15-40	0	0.0-2.0	0
	3-8	9.4-19	7.9-8.4	40-60	0	0.0-2.0	0
	8-14	---	---	---	---	---	---
	14-80	5.3-26	7.9-8.4	40-75	0	0.0-2.0	0-3
PAD:							
Paisano----------	0-3	9.4-19	7.9-8.4	15-40	0	0.0-2.0	0
	3-8	9.4-19	7.9-8.4	40-60	0	0.0-2.0	0
	8-14	---	---	---	---	---	---
	14-80	5.3-26	7.9-8.4	40-75	0	0.0-2.0	0-3
PIB:							
Paisano----------	0-3	9.4-19	7.9-8.4	15-40	0	0.0-2.0	0
	3-8	9.4-19	7.9-8.4	40-60	0	0.0-2.0	0
	8-14	---	---	---	---	---	---
	14-80	5.3-26	7.9-8.4	40-75	0	0.0-2.0	0-1
Musgrave----------	0-5	28-39	7.9-8.4	0-15	0-2	0.0-2.0	5-20
	5-18	26-41	7.9-9.0	0-15	0-2	0.0-2.0	5-20
	18-80	20-38	7.9-9.0	0-15	0-2	0.0-4.0	5-25
PKD:							
Pantak----------	0-3	20-28	5.6-6.5	0-2	0	0.0-1.0	0
	3-8	19-27	5.6-6.5	0-5	0	0.0-1.0	0-1
	8-22	---	---	---	---	---	---
Lingua----------	0-4	15-28	6.6-7.8	0-1	0	0	0
	4-14	---	---	---	---	---	---

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
PKE:							
Pantak	0-2	15-28	6.6-7.8	0-2	0	0.0-2.0	0
	2-6	19-27	6.6-7.8	0-5	0	0.0-2.0	0
	6-16	---	---	---	---	---	---
Lingua	0-8	16-25	6.6-8.4	0-1	0	0.0-2.0	0
	8-18	---	---	---	---	---	---
Rock outcrop	0-10	---	---	---	---	---	---
PTA:							
Phantom	0-3	27-31	6.6-8.4	0-5	0	0.0-2.0	0
	3-27	27-44	7.9-8.4	1-20	0	0.0-2.0	0
	27-80	26-43	7.9-8.4	2-20	0	0.0-2.0	0
PZB:							
Phantom	0-3	30-41	6.6-8.4	0-5	0	0.0-1.0	0
	3-30	26-44	7.9-8.4	0-10	0	0.0-2.0	0
	30-80	26-43	7.9-8.4	5-20	0	0.0-2.0	0
Musquiz	0-8	23-29	6.6-7.8	0-5	0	0.0-1.0	0
	8-23	28-42	6.6-7.8	0-10	0	0.0-2.0	0
	23-80	10-28	7.9-8.4	15-25	0	0.0-2.0	0
QBE:							
Quadria	0-5	17-28	7.4-8.4	0-5	0	0.0-2.0	0-2
	5-17	30-45	7.4-8.4	0-5	0	0.0-2.0	5-15
	17-46	16-35	7.4-8.4	0-10	0	4.0-12.0	30-40
	46-57	4.5-15	7.9-9.0	5-15	0	4.0-12.0	25-35
	57-80	4.3-15	7.9-9.0	0-5	0-1	4.0-12.0	35-45
Nolam	0-5	16-28	7.4-8.4	3-10	0	0.0-2.0	0
	5-12	21-35	7.4-8.4	5-15	0	0.0-2.0	0-1
	12-18	23-37	7.9-8.4	15-25	0-2	0.0-2.0	0-1
	18-48	9.3-28	7.9-8.4	15-40	0-2	0.0-2.0	0-1
	48-80	9.6-18	7.9-9.0	10-35	0-2	0.0-2.0	0-1
Musgrave	0-5	28-39	7.9-8.4	0-15	0-2	0.0-2.0	5-20
	5-18	26-41	7.9-9.0	0-15	0-2	0.0-2.0	5-20
	18-80	20-38	7.9-9.0	0-15	0-2	0.0-4.0	5-25
RCE:							
Redford	0-3	13-17	7.9-9.0	2-15	0	0.0-2.0	0
	3-14	6.6-17	7.9-9.0	5-30	0	0.0-2.0	0
	14-24	---	---	---	---	---	---
Corazones	0-3	13-17	7.9-8.4	5-15	0	0.0-2.0	0
	3-48	13-17	7.9-8.4	15-30	0	0.0-2.0	0-2
	48-80	8.4-13	7.4-8.4	15-30	0	0.0-4.0	0-8
RCG:							
Redford	0-2	13-17	7.9-9.0	2-15	0	0.0-2.0	0
	2-16	6.6-17	7.9-9.0	5-30	0	0.0-2.0	0
	16-26	---	---	---	---	---	---
Corazones	0-6	13-17	7.9-8.4	5-15	0	0.0-2.0	0
	6-48	13-17	7.9-8.4	15-30	0	0.0-2.0	0-2
	48-80	8.4-13	7.4-8.4	15-30	0	0.0-4.0	0-8

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
RED:							
Redlight----------	0-7	6.3-12	7.9-8.4	10-25	0	0.0-1.0	0
	7-15	5.1-9.4	7.9-8.4	25-40	0	0.0-1.0	0
	15-25	---	---	---	---	---	---
Terlingua----------	0-9	13-17	7.4-8.4	0-10	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
REE:							
Reduff----------	0-4	17-25	6.6-8.4	0-3	0	0.0-2.0	0-2
	4-15	16-25	6.6-8.4	0-1	0	0.0-2.0	0-2
	15-25	---	---	---	---	---	---
Scotal----------	0-3	15-28	7.9-8.4	1-15	0	0	0
	3-8	15-28	7.9-8.4	1-15	0	0	0
	8-18	---	---	---	---	---	---
Holguin----------	0-9	10-17	7.9-8.4	0-5	0	0	0
	9-19	10-19	7.9-8.4	0-5	0	0	0
	19-29	---	---	---	---	---	---
RIA:							
Riverwash----------	---	---	---	---	---	---	---
Pantera----------	0-3	3.6-11	7.9-9.0	2-5	0	0.0-2.0	0
	3-80	3.6-8.4	7.9-9.0	4-10	0	0.0-4.0	0
RMB:							
Rockhouse----------	0-13	15-22	6.6-8.4	0-2	0	0.0-2.0	0
	13-80	12-17	6.6-8.4	0-5	0	0.0-2.0	0
Medley----------	0-6	15-23	6.6-8.4	0-2	0	0.0-2.0	0
	6-22	15-28	7.4-8.4	0-2	0	0.0-2.0	0
	22-58	15-28	7.4-8.4	2-15	0	0.0-2.0	0
	58-80	15-28	7.4-8.4	2-15	0	0.0-2.0	0
SCB:							
Sanmoss----------	0-3	13-21	6.6-7.8	0-5	0	0.0-1.0	0
	3-12	13-25	6.6-8.4	0-5	0	0.0-1.0	0
	12-40	13-25	7.4-8.4	2-15	0	0.0-1.0	0
	40-55	13-24	7.4-8.4	2-15	0	0.0-1.0	0
	55-80	8.4-20	7.4-8.4	2-10	0	0.0-1.0	0
Medley----------	0-11	13-23	6.6-8.4	0	0	0.0-2.0	0
	11-25	13-28	6.6-8.4	0-2	0	0.0-2.0	0
	25-80	15-28	7.4-8.4	2-15	0	0.0-2.0	0
SDC:							
Sauceda----------	0-2	8.6-21	7.4-8.4	1-10	0	0.0-2.0	0
	2-8	15-21	7.9-8.4	1-10	0	0.0-2.0	0
	8-22	---	---	---	---	---	---
Boludo----------	0-4	17-29	7.4-8.4	5-20	0	0.0-2.0	0
	4-11	17-29	7.9-8.4	20-40	0	0.0-2.0	0
	11-17	---	---	---	---	---	---
	17-27	---	---	---	---	---	---

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
SEE:							
Sauceda	0-2	8.6-21	7.4-8.4	1-10	0	0.0-2.0	0
	2-8	15-21	7.9-8.4	1-10	0	0.0-2.0	0
	8-22	---	---	---	---	---	---
Decoty	0-5	7.3-16	7.4-8.4	5-15	0	0.0-2.0	0
	5-14	7.3-16	7.4-8.4	5-20	0	0.0-2.0	0
	14-24	---	---	---	---	---	---
SHC:							
Scotal	0-3	15-28	7.9-8.4	1-15	0	0.0-2.0	0
	3-8	15-28	7.9-8.4	1-15	0	0.0-2.0	0
	8-24	---	---	---	---	---	---
Holguin	0-9	10-16	7.9-8.4	0-5	0	0	0
	9-19	10-16	7.9-8.4	0-5	0	0	0
	19-29	---	---	---	---	---	---
SHE:							
Scotal	0-2	8.6-22	7.9-8.4	1-15	0	0.0-2.0	0
	2-7	8.4-22	7.9-8.4	1-15	0	0.0-2.0	0
	7-17	---	---	---	---	---	---
Rock outcrop	0-10	---	---	---	---	---	---
SIG:							
Scotal	0-3	15-28	7.9-8.4	1-15	0	0.0-2.0	0
	3-8	15-28	7.9-8.4	1-15	0	0.0-2.0	0
	8-18	---	---	---	---	---	---
Ohtwo	0-8	17-28	7.4-8.4	0-2	0	0.0-2.0	0
	8-35	16-28	7.4-8.4	0-5	0	0.0-2.0	0
	35-42	16-28	7.4-8.4	1-10	0	0.0-2.0	0
	42-65	15-27	7.4-8.4	1-10	0	0.0-2.0	0
	65-80	---	---	---	---	---	---
Rock outcrop	0-10	---	---	---	---	---	---
SRA:							
Straddlebug	0-4	22-32	7.9-9.0	1-10	0	0.0-2.0	1-5
	4-18	21-35	7.9-9.0	5-15	0	0.0-2.0	10-20
	18-26	20-27	7.9-9.0	2-15	0	2.0-4.0	20-35
	26-33	15-27	7.9-9.0	2-15	0	2.0-4.0	20-35
	33-58	8.4-15	7.9-9.0	2-15	0	2.0-4.0	20-35
	58-80	19-27	7.9-9.0	2-15	0	2.0-4.0	20-35
STE:							
Strawhouse	0-3	5.0-18	7.9-8.4	40-60	0	0.0-2.0	0
	3-7	4.5-15	7.9-8.4	40-75	0	0.0-2.0	0
	7-28	---	---	---	---	---	---
	28-80	5.3-14	7.9-8.4	40-75	0	0.0-2.0	0
Stillwell	0-7	3.7-16	7.4-8.4	40-80	0	0.0-2.0	0
	7-25	3.4-11	7.4-8.4	40-80	0	0.0-4.0	0-5
	25-80	3.4-11	7.4-8.4	40-80	0	2.0-8.0	20-35
SUD:							
Studybutte	0-5	16-25	6.6-8.4	0-10	0	0	0
	5-10	13-25	6.6-8.4	0-10	0	0	0
	10-20	---	---	---	---	---	---

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
SUE:							
Studybutte----------	0-3	4.6-21	6.6-8.4	0-2	0	0.0-2.0	0
	3-6	4.6-21	6.6-8.4	0-2	0	0.0-2.0	0
	6-16	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
SUG:							
Studybutte----------	0-3	4.6-21	6.6-8.4	0-2	0	0.0-2.0	0
	3-6	4.6-21	6.6-8.4	0-2	0	0.0-2.0	0
	6-16	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
TEA:							
Tenneco----------	0-3	15-24	7.4-8.4	1-10	0	0.0-2.0	0
	3-28	15-28	7.9-8.4	2-10	0	0.0-2.0	0
	28-80	8.6-35	7.9-8.4	3-15	0	0.0-2.0	0-1
Bodecker----------	0-8	8.6-21	7.9-8.4	0-10	0	0.0-2.0	0
	8-14	8.6-24	7.9-8.4	0-10	0	0.0-2.0	0
	14-35	2.9-17	7.9-8.4	0-10	0	0.0-2.0	0
	35-80	8.6-28	7.9-8.4	0-10	0	0.0-2.0	0
TRE:							
Terlingua----------	0-9	4.6-17	7.9-8.4	5-15	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
TRG:							
Terlingua----------	0-13	4.6-13	7.9-8.4	2-10	0-1	0.0-2.0	0
	13-23	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
VAA:							
Verhalen----------	0-7	27-44	7.4-8.4	1-10	0	2.0-4.0	0
	7-54	26-44	7.9-8.4	5-15	0-5	2.0-8.0	0-2
	54-80	13-35	7.9-8.4	5-20	0-10	2.0-8.0	0-2
VCA:							
Vicente----------	0-9	15-22	7.4-8.4	5-10	0	0.0-4.0	2-4
	9-80	8.4-15	7.4-8.4	10-15	0	0.0-4.0	2-4
Lomapelona----------	0-11	8.6-23	7.4-8.4	2-10	0	0.0-4.0	0-2
	11-80	8.4-16	7.4-8.4	2-10	0	0.0-4.0	0-2
Castolon----------	0-11	23-31	7.9-8.4	5-15	0-3	0.0-8.0	0-6
	11-23	19-31	7.9-8.4	5-15	0-3	0.0-8.0	0-6
	23-80	19-38	7.9-8.4	5-15	0-3	0.0-8.0	0-6
VOC:							
Volco----------	0-5	11-21	7.4-8.4	5-15	0	0.0-2.0	0
	5-18	11-29	7.4-8.4	20-35	0	0.0-2.0	0
	18-28	---	---	---	---	---	---

Table 30.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	pH	Pct	Pct	mmhos/cm	
Pardo----------	0-5	21-29	7.9-8.4	2-15	0	0.0-2.0	0
	5-15	17-29	7.9-8.4	20-40	0	0.0-2.0	0
	15-18	---	---	---	---	---	---
	18-28	---	---	---	---	---	---
W:							
Water----------	---	---	---	---	---	---	---

Table 31.--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				
ALB:										
Altar	A	Very low	Jul-Oct	---	---	---	---	None	---	Rare
Bodecker	A	Very low	Jul-Oct	---	---	---	---	None	Very brief	Occasional
Riverwash	---	---	Jan-Feb	---	---	---	---	---	Brief	Frequent
			Jul-Oct	---	---	---	---	---	Brief	Frequent
			Dec	---	---	---	---	---	Brief	Frequent
ANS:										
Area not surveyed	---	---	Jan-Dec	---	---	---	---	---	---	---
BAC:										
Baviza	A	Very low	Jan-Dec	---	---	---	---	None	---	None
Pantera	A	Very low	Jul-Sep	---	---	---	---	None	Extremely brief	Frequent
BEB:										
Berrend	C	Low	Jan-Dec	---	---	---	---	None	---	None
Espy	D	Medium	Jan-Dec	---	---	---	---	None	---	None
BIC:										
Bissett	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
BIE:										
Bissett	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
BIG:										
Bissett	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
BLE:										
Blackgap	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None

Table 31.--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				
BLG:										
Blackgap	D	High	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
BNE:										
Bofecillos	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Horsetrap	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
BNG:										
Bofecillos	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	---	---	---
BOB:										
Boracho	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Espy	D	Medium	Jan-Dec	---	---	---	---	None	---	None
BOC:										
Borunda	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Borunda, gravelly	D	Medium	Jan-Dec	---	---	---	---	None	---	None
BRD:										
Brewster	D	Very high	Jan-Dec	---	---	---	---	None	---	None
BRF:										
Brewster	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	---	---	---
BRG:										
Brewster	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
BUD:										
Buckear	D	High	Jan-Dec	---	---	---	---	None	---	None
Coyanosa	D	Very high	Jan-Dec	---	---	---	---	None	---	None
CAA:										
Castolon	C	Negligible	Jul-Sep	---	---	---	---	None	Brief	Occasional

Table 31.--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				
CAG:										
Catto	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Buckear	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
CIC:										
Chilicotal	B	Low	Jan-Dec	---	---	---	---	None	---	None
CID:										
Chilicotal	B	Medium	Jan-Dec	---	---	---	---	None	---	None
CLC:										
Chilicotal	B	Low	Jan-Dec	---	---	---	---	None	---	None
Paisano	D	Medium	Jan-Dec	---	---	---	---	None	---	None
CMC:										
Chilimol	B	Medium	Jan-Dec	---	---	---	---	None	---	None
Boracho	D	High	Jan-Dec	---	---	---	---	None	---	None
Berrend	C	Medium	Jan-Dec	---	---	---	---	None	---	None
CND:										
Chinati	D	High	Jan-Dec	---	---	---	---	None	---	None
Boracho	D	High	Jan-Dec	---	---	---	---	None	---	None
Berrend	C	Medium	Jan-Dec	---	---	---	---	None	---	None
CNE:										
Chinati	D	High	Jan-Dec	---	---	---	---	None	---	None
Boracho	D	High	Jan-Dec	---	---	---	---	None	---	None
COC:										
Corazones	A	Low	Jan-Dec	---	---	---	---	None	---	None
Ojinaga	D	High	Jan-Dec	---	---	---	---	None	---	None
COE:										
Corazones	A	Medium	Jan-Dec	---	---	---	---	None	---	None
Ojinaga	D	Very high	Jan-Dec	---	---	---	---	None	---	None
CVC:										
Costavar	D	High	Jan-Dec	---	---	---	---	None	---	None
Volco	D	High	Jan-Dec	---	---	---	---	None	---	None

Table 31.--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				
EEB:										
Espy	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Eppenauer	C	Low	Jan-Dec	---	---	---	---	None	---	None
GAA:										
Galindo	C	Low	Jul-Sep	---	---	---	---	None	Brief	Occasional
GEF:										
Geefour	D	High	Jan-Dec	---	---	---	---	None	---	None
Geefour, eroded	D	Very high	Jan-Dec	---	---	---	---	None	---	None
GFF:										
Geefour	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Corazones	A	Low	Jan-Dec	---	---	---	---	None	---	None
Ojinaga	D	High	Jan-Dec	---	---	---	---	None	---	None
GMF:										
Geefour	D	High	Jan-Dec	---	---	---	---	None	---	None
Melado	D	High	Jan-Dec	---	---	---	---	None	---	None
GSA:										
Gemelo	A	Very low	Jan-Dec	---	---	---	---	None	---	None
Straddlebug	C	Low	Jan-Dec	---	---	---	---	None	---	None
HOB:										
Holguin	D	Very high	Jan-Dec	---	---	---	---	None	---	None
HOD:										
Horsetrap	D	High	Jan-Dec	---	---	---	---	None	---	None
Bofecillos	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	---	---	---
KIB:										
Kinco	A	Very low	Jan-Dec	---	---	---	---	None	---	None
LGC:										
Lingua	D	High	Jan-Dec	---	---	---	---	None	---	None
LIF:										
Lingua	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Ohtwo	B	High	Jan-Dec	---	---	---	---	None	---	None

Table 31.--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				
MAE:										
Manzanillo	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Paisano	D	High	Jan-Dec	---	---	---	---	None	---	None
MBE:										
Manzanillo	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Chilicotal	B	Medium	Jan-Dec	---	---	---	---	None	---	None
Holguin	D	Very high	Jan-Dec	---	---	---	---	None	---	None
MCA:										
Marfa	C	Low	Jul-Sep	---	---	---	---	None	Brief	Occasional
MDE:										
Mariscal	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
MOA:										
Martillo	C	Low	Jan-Dec	---	---	---	---	None	---	None
Butcherknife	C	Medium	Jan-Dec	---	---	---	---	None	---	None
MPB:										
Melado	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Pantera	D	Medium	Jul-Sep	---	---	---	---	None	Extremely brief	Occasional
MUB:										
Murray	B	Low	Jan-Dec	---	---	---	---	None	---	None
Marfa	C	Low	Jan-Dec	---	---	---	---	None	---	None
Boracho	D	Medium	Jan-Dec	---	---	---	---	None	---	None
MZA:										
Musquiz	C	Medium	Jan-Dec	---	---	---	---	None	---	None
NLA:										
Nillo	C	Medium	Jun-Sep	---	---	---	---	None	Very brief	Occasional
NPB:										
Nolam	B	Low	Jan-Dec	---	---	---	---	None	---	None
Paisano	D	Medium	Jan-Dec	---	---	---	---	None	---	None

Table 31.--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				
PAC:										
Paisano	D	Medium	Jan-Dec	---	---	---	---	None	---	None
PAD:										
Paisano	D	High	Jan-Dec	---	---	---	---	None	---	None
PIB:										
Paisano	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Musgrave	D	Medium	Jan-Dec	---	---	---	---	None	---	None
PKD:										
Pantak	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Lingua	D	High	Jan-Dec	---	---	---	---	None	---	None
PKE:										
Pantak	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Lingua	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
PTA:										
Phantom	C	Medium	Apr-Oct	---	---	---	---	None	Very brief	Occasional
PZB:										
Phantom	C	Medium	Jan-Dec	---	---	---	---	None	---	None
Musquiz	C	Medium	Jan-Dec	---	---	---	---	None	---	None
QBE:										
Quadria	C	Medium	Jan-Dec	---	---	---	---	None	---	None
Nolam	C	Medium	Jan-Dec	---	---	---	---	None	---	None
Musgrave	D	High	Jan-Dec	---	---	---	---	None	---	None
RCE:										
Redford	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Corazones	A	Medium	Jan-Dec	---	---	---	---	None	---	None
RCG:										
Redford	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Corazones	A	Medium	Jan-Dec	---	---	---	---	None	---	None

Table 31.--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				
RED:										
Redlight	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Terlingua	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
REE:										
Reduff	D	High	Jan-Dec	---	---	---	---	None	---	None
Scotal	D	High	Jan-Dec	---	---	---	---	None	---	None
Holguin	D	Medium	Jan-Dec	---	---	---	---	None	---	None
RIA:										
Riverwash	---	---	Jun-Sep	---	---	---	---	None	Very brief	Frequent
Pantera	A	Very low	Jul-Sep	---	---	---	---	None	Extremely brief	Frequent
RMB:										
Rockhouse	A	Negligible	Jul-Oct	---	---	---	---	None	Very brief	Occasional
Medley	B	Low	Jan-Dec	---	---	---	---	None	---	None
SCB:										
Sanmoss	B	Low	Jan-Dec	---	---	---	---	None	---	None
Medley	B	Very low	Jan-Dec	---	---	---	---	None	---	None
SDC:										
Sauceda	D	High	Jan-Dec	---	---	---	---	None	---	None
Boludo	D	High	Jan-Dec	---	---	---	---	None	---	None
SEE:										
Sauceda	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Decoty	D	Very high	Jan-Dec	---	---	---	---	None	---	None
SHC:										
Scotal	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Holguin	D	High	Jan-Dec	---	---	---	---	None	---	None
SHE:										
Scotal	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None

Table 31.--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				
SIG:										
Scotal	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Ohtwo	B	High	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	---	---	---
SRA:										
Straddlebug	C	Low	Jul-Oct	---	---	---	---	None	---	Rare
STE:										
Strawhouse	D	High	Jan-Dec	---	---	---	---	None	---	None
Stillwell	B	Medium	Jan-Dec	---	---	---	---	None	---	None
SUE:										
Studybutte	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
SUG:										
Studybutte	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
TEA:										
Tenneco	C	Low	Jan-Dec	---	---	---	---	None	---	None
Bodecker	B	Low	Jul-Oct	---	---	---	---	None	Very brief	Occasional
TRE:										
Terlingua	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	---	---	---
TRG:										
Terlingua	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	---	Jan-Dec	---	---	---	---	None	---	None
VAA:										
Verhalen	D	Low	Jan-Dec	---	---	---	---	None	---	Rare

Table 31.--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				
VCA:										
Vicente	C	Negligible	Jul-Sep	---	---	---	---	None	Long	Occasional
Lomapelona	C	Negligible	Jul-Sep	---	---	---	---	None	Long	Occasional
Castolon	C	Negligible	Jul-Sep	---	---	---	---	None	Long	Occasional
VOC:										
Volco	D	High	Jan-Dec	---	---	---	---	None	---	None
Pardo	D	High	Jan-Dec	---	---	---	---	None	---	None
W:										
Water	---	---	Jan-Dec	---	---	---	---	---	---	---

Table 32.--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			
ALB:						
Altar	---	---	---	---	Moderate	Low
Bodecker	---	---	---	---	Moderate	Moderate
Riverwash	---	---	---	---	---	---
ANS:						
Area not surveyed	---	---	---	---	---	---
BAC:						
Baviza	---	---	---	---	Moderate	Moderate
Pantera	---	---	---	---	High	Moderate
BEB:						
Berrend	---	---	---	---	Moderate	Low
Espy	Petrocalcic	10-20	---	Strongly cemented	Moderate	Low
BIC:						
Bissett	Lithic bedrock	7-20	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
BIE:						
Bissett	Lithic bedrock	7-20	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
BIG:						
Bissett	Lithic bedrock	7-20	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
BLE:						
Blackgap	Lithic bedrock	6-20	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
BLG:						
Blackgap	Lithic bedrock	6-20	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
BNE:						
Bofecillos	Lithic bedrock	2-10	---	Indurated	Moderate	Low
Horsetrap	Lithic bedrock	10-20	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
BNG:						
Bofecillos	Lithic bedrock	4-10	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
BOB:						
Boracho	Petrocalcic	7-20	4-30	Strongly cemented	Moderate	Low
Espy	Petrocalcic	10-20	---	Moderately cemented	Moderate	Low
BOC:						
Borunda	Paralithic bedrock	20-40	---	Moderately cemented	High	High
	Lithic bedrock	30-80	---	Strongly cemented		
Borunda, gravelly	Paralithic bedrock	20-40	---	Moderately cemented	High	High
	Lithic bedrock	30-80	---	Strongly cemented		

Table 32.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
BRD:						
Brewster	Lithic bedrock	2-20	---	Indurated	Moderate	Low
BRF:						
Brewster	Lithic bedrock	4-20	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
BRG:						
Brewster	Lithic bedrock	4-20	---	Indurated	Low	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
BUD:						
Buckear	Paralithic bedrock	4-20	---	Moderately cemented	Moderate	Low
Coyanosa	Lithic bedrock	3-14	---	Very strongly cemented	Moderate	Low
CAA:						
Castolon	---	---	---	---	Moderate	Moderate
CAG:						
Catto	Lithic bedrock	4-20	---	Indurated	Moderate	Low
Buckear	Paralithic bedrock	4-20	---	Moderately cemented	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
CIC:						
Chilicotal	---	---	---	---	Moderate	Moderate
CID:						
Chilicotal	---	---	---	---	Moderate	Moderate
CLC:						
Chilicotal	---	---	---	---	Moderate	Moderate
Paisano	Petrocalcic	5-20	4-17	Strongly cemented	Moderate	Low
CMC:						
Chilimol	---	---	---	---	Moderate	Low
Boracho	Petrocalcic	7-20	4-30	Strongly cemented	Moderate	Low
Berrend	---	---	---	---	Moderate	Low
CND:						
Chinati	Petrocalcic	8-20	---	Strongly cemented	Moderate	Low
	Lithic bedrock	20-40	---	Strongly cemented		
Boracho	Petrocalcic	7-20	---	Strongly cemented	Moderate	Low
Berrend	---	---	---	---	Moderate	Low
CNE:						
Chinati	Petrocalcic	8-20	---	Strongly cemented	Moderate	Low
	Lithic bedrock	20-40	---	Strongly cemented		
Boracho	Petrocalcic	7-20	4-30	Strongly cemented	Moderate	Low
COC:						
Corazones	---	---	---	---	Moderate	Moderate
Ojinaga	Petrocalcic	4-15	---	Strongly cemented	High	High

Table 32.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
COE:						
Corazones	---	---	---	---	Moderate	Moderate
Ojinaga	Petrocalcic	6-20	---	Strongly cemented	Moderate	Moderate
CVC:						
Costavar	Lithic bedrock	4-18	---	Indurated	Moderate	Low
Volco	Lithic bedrock	6-20	---	Indurated	Moderate	Low
EEB:						
Espy	Petrocalcic	10-20	---	Strongly cemented	Moderate	Low
Eppenauer	Paralithic bedrock	20-40	---	Weakly cemented	Moderate	Low
GAA:						
Galindo	---	---	---	---	High	Moderate
GEF:						
Geefour	Densic bedrock	5-20	---	Noncemented	High	High
Geefour, eroded	Densic bedrock	5-20	---	Noncemented	High	High
GFF:						
Geefour	Densic bedrock	5-20	---	Noncemented	High	High
Corazones	---	---	---	---	Moderate	Moderate
Ojinaga	Petrocalcic	6-20	---	Strongly cemented	High	High
GMF:						
Geefour	Densic bedrock	10-20	---	Noncemented	High	High
Melado	---	---	---	---	High	High
GSA:						
Gemelo	---	---	---	---	High	Moderate
Straddlebug	---	---	---	---	Moderate	Moderate
HOB:						
Holguin	Lithic bedrock	4-20	---	Indurated	Moderate	Low
HOD:						
Horsetrap	Lithic bedrock	10-20	---	Indurated	Moderate	Low
Bofecillos	Lithic bedrock	2-10	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
KIB:						
Kinco	---	---	---	---	Moderate	Low
LGC:						
Lingua	Lithic bedrock	4-20	---	Indurated	Low	Low
LIF:						
Lingua	Lithic bedrock	4-20	---	Indurated	Low	Low
Ohtwo	Lithic bedrock	60-80	---	Indurated	Moderate	Low
MAE:						
Manzanillo	Petrocalcic	4-18	---	Weakly cemented	Moderate	Low
	Lithic bedrock	10-20	---	Strongly cemented		
Paisano	Petrocalcic	5-20	---	Strongly cemented	Moderate	Low
MBE:						
Manzanillo	Petrocalcic	4-18	---	Moderately cemented	Moderate	Low
	Lithic bedrock	10-20	---	Strongly cemented		

Table 32.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
Chilicotal	---	---	---	---	Moderate	Moderate
Holguin	Lithic bedrock	4-20	---	Indurated	Moderate	Low
MCA:						
Marfa	---	---	---	---	Moderate	Low
MDE:						
Mariscal	Lithic bedrock	4-20	---	Very strongly cemented	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Very strongly cemented	---	---
MOA:						
Martillo	---	---	---	---	High	Moderate
Butcherknife	Paralithic bedrock	40-60	---	Moderately cemented	High	High
MPB:						
Melado	---	---	---	---	High	High
Pantera	---	---	---	---	Moderate	High
MUB:						
Murray	---	---	---	---	Low	Low
Marfa	---	---	---	---	Moderate	Low
Boracho	Petrocalcic	7-20	4-30	Strongly cemented	Moderate	Low
MZA:						
Musquiz	---	---	---	---	Moderate	Low
NLA:						
Nillo	---	---	---	---	Moderate	Moderate
NPB:						
Nolam	---	---	---	---	Moderate	Low
Paisano	Petrocalcic	7-20	4-17	Indurated	Moderate	Low
PAC:						
Paisano	Petrocalcic	7-14	4-17	Indurated	Moderate	Low
PAD:						
Paisano	Petrocalcic	7-14	4-17	Indurated	Moderate	Low
PIB:						
Paisano	Petrocalcic	7-14	4-17	Indurated	Moderate	Low
Musgrave	Densic bedrock	4-20	---	Noncemented	High	Low
PKD:						
Pantak	Lithic bedrock	7-20	---	Indurated	Moderate	Low
Lingua	Lithic bedrock	3-20	---	Indurated	Moderate	Low
PKE:						
Pantak	Lithic bedrock	4-20	---	Very strongly cemented	Moderate	Low
Lingua	Lithic bedrock	4-10	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
PTA:						
Phantom	---	---	---	---	High	Low

Table 32.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
PZB:						
Phantom	---	---	---	---	High	Low
Musquiz	---	---	---	---	Moderate	Low
QBE:						
Quadria	Natric	---	---	Noncemented	High	High
Nolam	---	---	---	---	Moderate	Low
Musgrave	Densic bedrock	4-20	---	Noncemented	High	Low
RCE:						
Redford	Lithic bedrock	7-20	---	Strongly cemented	Moderate	Low
Corazones	---	---	---	---	Moderate	Moderate
RCG:						
Redford	Lithic bedrock	7-20	---	Strongly cemented	Moderate	Low
Corazones	---	---	---	---	Moderate	Moderate
RED:						
Redlight	Lithic bedrock	7-20	---	Indurated	Low	Low
Terlingua	Lithic bedrock	4-20	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
REE:						
Reduff	Lithic bedrock	4-20	---	Strongly cemented	Moderate	Low
Scotal	Lithic bedrock	4-20	---	Strongly cemented	Moderate	Low
Holguin	Lithic bedrock	4-20	---	Indurated	Low	Low
RIA:						
Riverwash	---	---	---	---	---	---
Pantera	---	---	---	---	High	Moderate
RMB:						
Rockhouse	---	---	---	---	Moderate	Low
Medley	---	---	---	---	Moderate	Low
SCB:						
Sanmoss	---	---	---	---	Low	Low
Medley	---	---	---	---	Moderate	Low
SDC:						
Sauceda	Lithic bedrock	4-20	---	Indurated	Moderate	Low
Boludo	Petrocalcic	7-18	---	Very strongly cemented	Moderate	Low
	Lithic bedrock	10-20	---	Indurated		
SEE:						
Sauceda	Lithic bedrock	4-20	---	Indurated	Moderate	Low
Decoty	Lithic bedrock	7-20	---	Indurated	Moderate	Low
SHC:						
Scotal	Lithic bedrock	4-20	---	Strongly cemented	Moderate	Low
Holguin	Lithic bedrock	4-20	---	Indurated	Low	Low
SHE:						
Scotal	Lithic bedrock	4-20	---	Strongly cemented	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Strongly cemented	---	---

Table 32.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
SIG:						
Scotal	Lithic bedrock	4-20	---	Strongly cemented	Moderate	Low
Ohtwo	Lithic bedrock	60-80	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Strongly cemented	---	---
SRA:						
Straddlebug	---	---	---	---	Moderate	Moderate
STE:						
Strawhouse	Petrocalcic	4-28	4-30	Strongly cemented	Moderate	Low
Stillwell	---	---	---	---	High	Moderate
SUD:						
Studybutte	Lithic bedrock	4-20	---	Indurated	Moderate	Low
SUE:						
Studybutte	Lithic bedrock	4-20	---	Very strongly cemented	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Very strongly cemented	---	---
SUG:						
Studybutte	Lithic bedrock	4-20	---	Very strongly cemented	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Very strongly cemented	---	---
TEA:						
Tenneco	---	---	---	---	Moderate	Low
Bodecker	---	---	---	---	Moderate	Low
TRE:						
Terlingua	Lithic bedrock	4-14	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
TRG:						
Terlingua	Lithic bedrock	4-14	---	Indurated	Low	Low
Rock outcrop	Lithic bedrock	0-4	---	Indurated	---	---
VAA:						
Verhalen	---	---	---	---	High	High
VCA:						
Vicente	---	---	---	---	High	Moderate
Lomapelona	---	---	---	---	Moderate	Moderate
Castolon	---	---	---	---	Moderate	Moderate
VOC:						
Volco	Lithic bedrock	6-20	---	Indurated	Moderate	Low
Pardo	Petrocalcic	6-18	4-14	Strongly cemented	Moderate	Low
	Lithic bedrock	8-20	---	Indurated		
W:						
Water	---	---	---	---	---	---

Table 33.--Physical Analyses of Selected Soils

(The abbreviation "COLE" means coefficient of linear extensibility. Dashes indicate that data were not available. Footnotes indicate lab analyses and location of pedons.)

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	Coarse Frag-ments	COLE	Bulk Density: 1/3-bar	Bulk Density: Oven Dry	Water Content 1/3-bar
	In		(by weight)											cm/cm	g/cc	g/cc	Wt %
Baviza (4,5)																	
(S08-TX377-008)																	
T083770081	0-2	A	8.4	18.7	28.0	27.1	7.8	90.0	---	7.1	---	2.8	---	---	---	---	---
T083770082	2-11	Bw	7.8	21.8	29.9	27.6	8.3	95.4	---	2.2	---	2.4	---	---	---	---	---
T083770083	11-28	C1	19.4	23.1	22.4	16.2	7.9	89.0	---	6.2	---	4.9	---	---	---	---	---
T083770084	28-40	C2	18.3	20.2	20.8	20.2	6.7	86.2	---	5.0	---	8.7	---	---	---	---	---
T083770085	40-55	C3	25.8	32.9	20.6	7.3	1.6	88.2	---	6.6	---	5.2	---	---	---	---	---
Corazones (2,6)																	
(S85-TX377-001)																	
85P03334	0-10	A	13.8	12.5	11.2	12.5	14.9	64.9	11.9	24.8	---	10.3	55.0	---	---	---	---
85P03335	10-29	Bk1	24.7	12.2	10.4	11.3	12.6	71.2	10.6	20.7	---	8.1	60.0	---	---	---	---
85P03336	29-45	Bk2	26.5	18.0	14.9	11.8	8.4	79.6	8.2	14.7	---	5.7	92.0	---	---	---	---
85P03337	45-55	2C	24.8	21.6	20.0	13.2	5.0	84.6	5.4	10.1	---	5.3	61.0	---	---	---	---
Decoty (3,7)																	
(S93-TX377-003)																	
4754	0-5	A	17.9	9.7	5.4	11.0	20.8	64.8	13.7	24.6	3.3	10.6	66	---	---	---	---
4755	5-14	Bk	12.4	7.3	4.8	10.4	19.7	54.6	20.8	33.2	4.8	12.2	68	---	---	---	---
4756	14-40	Crk	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Marfa (4,8)																	
(S99-TX377-001a)																	
T993770011	0-3	A	0.2	0.8	2.8	13.0	12.4	29.2	---	39.9	---	31.0	---	---	---	---	---
T993770012	3-13	Bt1	0.2	1.0	3.2	11.9	9.9	26.2	---	40.7	---	33.1	---	---	---	---	---
T993770013	13-24	Bt2	1.5	1.6	4.8	16.0	9.1	33.0	---	28..7	---	38.3	---	---	---	---	---
T993770014	24-41	Bt3	1.1	1.8	5.5	17.7	8.7	34.8	---	25.2	---	39.9	---	---	---	---	---
T993770015	41-55	2Btk1	0.7	1.4	5.8	20.1	13.3	41.3	---	37.6	---	21.1	---	---	---	---	---
T993770016	55-69	2Btk	0.7	1.5	6.4	28.6	14.3	51.5	---	34.4	---	14.2	---	---	---	---	---
T993770017	69-80	2Bk	6.5	12.2	13.9	27.3	16.4	76.3	---	21.6	---	2.1	---	---	---	---	---

Table 33.--Physical Analyses 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	Coarse Frag-ments	COLE	Bulk Density: 1/3-bar	Bulk Density: Oven Dry	Water Content 1/3-bar
	In		(by weight)											cm/cm	g/cc	g/cc	Wt %
Martillo (3, 9)																	
(S93-TX377-004)																	
4757	0-4	A	2.9	3.4	4.0	9.2	10.9	30.4	30.7	40.8	3.4	28.8	7	0.117	0.94	1.31	61.5
4758	4-12	Bw1	1.1	2.0	2.8	6.6	8.7	21.2	23.2	26.8	24.5	52.0	---	0.222	0.97	1.77	67.9
4759	12-17	Bw2	0.3	1.3	2.3	6.0	9.4	19.3	23.5	28.5	24.8	52.2	---	0.134	1.18	1.72	39.9
4760	17-23	2Bw3	1.0	2.2	2.3	6.1	13.3	24.9	26.9	34.4	14.1	40.7	2	0.158	1.07	1.66	51.0
4761	23-34	2Bz	1.2	1.9	2.0	5.8	13.1	24.0	12.8	49.3	11.8	26.7	1	0.066	1.08	1.31	47.1
4762	34-44	3Bkz1	1.3	2.0	1.8	6.6	22.1	33.8	21.3	40.8	12.3	25.4	1	0.073	1.14	1.41	63.6
4763	44-55	3Bkz2	3.4	7.3	8.0	12.7	18.2	49.6	16.6	29.2	8.3	21.2	3	0.076	0.98	1.22	51.9
4764	55-64	4B'w1	1.8	3.9	4.8	14.8	19.9	45.2	21.2	28.8	12.9	26.0	4	0.065	1.15	1.39	43.1
4765	64-72	5B'w2	1.3	3.6	3.0	5.1	13.3	26.3	30.1	40.7	15.5	33.0	1	0.137	1.00	1.47	60.2
4766	72-80	6Bk	0.3	0.4	0.4	1.2	8.3	10.6	28.2	55.5	16.6	33.9	---	0.095	1.09	1.43	52.0
Melado (3, 10)																	
(S04-TX377-002)																	
6846	0-4	Az	0.1	0.2	0.4	3.0	11.9	15.6	28.7	39.3	8.9	45.1	1	0.070	1.20	1.47	39.4
6847	4-10	Bz1	0.2	0.2	0.4	2.5	11.4	14.7	27.6	38.2	12.8	47.1	---	0.076	1.35	1.68	33.1
6848	10-22	Bz2	0.0	0.1	0.4	3.3	13.2	17.0	26.6	36.2	14.2	46.8	---	0.078	1.34	1.68	34.5
6849	22-35	Bz3	0.2	0.2	0.4	2.0	9.4	12.2	29.5	37.5	14.0	50.3	---	0.077	1.36	1.70	33.6
6850	35-44	Bz4	0.4	0.8	1.9	7.2	17.6	27.9	21.5	32.5	10.3	39.6	---	0.030	1.39	1.52	26.3
6851	44-61	BCz	0.4	0.9	2.5	15.6	30.7	50.1	12.6	21.6	10.1	28.3	---	0.026	1.40	1.51	27.3
6852	61-80	Cyz1	2.1	1.8	1.3	8.8	18.4	32.4	19.9	27.5	14.7	40.1	4	0.033	1.35	1.49	28.6
6853	61-80	Cyz2	27.6	23.5	10.6	10.3	7.3	79.3	5.2	8.0	5.0	12.7	33	---	---	---	---
Nillo (3, 11)																	
(S93-TX377-005)																	
4767	0-3	A	0.2	0.1	0.1	0.4	1.8	2.6	39.6	47.2	10.0	50.2	---	---	---	---	---
4768	3-12	C1	0.2	0.4	1.6	13.7	30.7	46.6	12.2	36.5	9.1	16.9	---	0.042	1.14	1.29	37.4
4769	12-26	C2	0.2	0.2	1.3	7.6	19.1	28.4	17.3	46.5	11.3	25.1	---	0.045	1.13	1.29	40.3
4770	26-32	Ab	1.5	1.5	2.3	10.0	17.9	33.2	23.1	39.2	8.1	27.6	2	0.066	1.08	1.31	42.8
4771	32-46	Bwb1	0.4	1.0	2.1	8.0	16.4	27.9	23.3	32.2	15.3	39.9	---	0.120	1.16	1.63	42.9
4772	46-55	Bwb2	0.0	0.4	0.9	5.0	18.8	25.1	24.9	37.0	14.3	37.9	---	0.100	1.15	1.53	42.0
4773	55-66	Bwb3	0.3	1.2	4.8	15.2	17.0	38.5	19.4	30.5	9.5	31.2	---	0.076	1.22	1.52	40.2
4774	66-80	Bkb	0.2	0.5	1.8	8.6	15.6	26.7	26.4	36.2	12.9	37.1	---	0.079	1.17	1.47	41.5

Table 33.--Physical Analyses 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	Coarse Frag-ments	COLE	Bulk Density: 1/3-bar	Bulk Density: Oven Dry	Water Content 1/3-bar
	In		(by weight)											cm/cm	g/cc	g/cc	Wt %
Ojinaga (3, 12) (S04-TX377-001)																	
6837	0-5	A	10.9	9.9	10.2	15.9	14.9	61.8	15.4	24.2	1.9	14.0	47	0.003	1.09	1.10	45.6
6838	5-12	Bk	18.3	13.2	10.4	12.0	10.7	64.6	15.5	22.4	2.4	13.0	26	---	---	---	---
6839	12-16	Bkm1	19.5	14.6	12.5	12.4	9.6	68.6	14.8	21.1	2.1	10.3	45	0.003	1.29	1.30	32.2
6840	16-22	Bkm2	16.1	12.5	13.7	16.4	11.8	70.5	15.3	21.8	1.7	7.7	51	0.000	1.35	1.35	30.9
6841	22-34	BCk1	18.5	16.3	17.7	16.1	10.3	78.9	10.4	16.1	1.2	5.0	58	0.003	1.26	1.27	34.6
6842	34-49	BCk2	14.6	17.3	19.8	18.1	9.3	79.1	9.8	15.7	1.8	5.2	64	---	---	---	---
6843	49-57	CBk1	25.3	16.4	14.7	11.4	7.5	75.3	8.9	15.5	2.0	9.2	84	---	---	---	---
6844	57-69	CBk2	20.9	17.5	15.4	12.0	8.7	74.5	11.9	18.5	1.5	7.0	78	---	---	---	---
6845	69-80	C	28.8	24.5	21.4	10.4	3.1	88.2	3.7	5.1	1.8	6.7	70	---	---	---	---
Sauceda (3, 13) (S93-TX377-002)																	
4752	0-2	A1	6.4	4.8	3.4	11.7	20.7	47.0	18.3	39.3	3.8	13.7	73	---	---	---	
4753	2-8	A2	5.5	3.1	2.7	9.9	17.7	38.9	21.2	41.8	6.2	19.3	56	---	---	---	
Terlingua (4, 14) (S08-TX377-595)																	
T083775451	0-3	A1	22.0	13.5	10.8	11.1	10.4	67.8	---	26.5	---	5.7	---	---	---	---	---
T083775452	3-13	A2	15.8	12.2	11.7	13.9	10.5	64.1	---	27.8	---	8.1	---	---	---	---	---
Terlingua (4, 15) (S08-TX377-2046)																	
	0-7	A	26.7	20.1	8.9	7.4	6.8	69.9	---	23.5	---	6.6	---	---	---	---	---

1 Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

2 Analyses by USDA-NRCS National Soil Survey Laboratory, Lincoln, Nebraska.

3 Analyses by Texas A&M University Soil Characterization Laboratory, College Station, Texas.

4 Analyses by Texas Tech University Soil Characterization Laboratory, Lubbock, Texas.

Table 33.--Physical Analyses of Selected Soils--Continued

5 Location of Baviza; USGS topographic quadrangle: Adobes; Latitude: 29 degrees 51 minutes 44.21 seconds N; Longitude: 104 degrees 34 minutes 31.90 seconds W; UTM Zone: 13; UTM Easting: 540996 meters; UTM Northing: 3303601 meters.

6 Location of Corazones; USGS topographic quadrangle: Las Conchas; Latitude: 29 degrees 59 minutes 52.0 seconds N; Longitude: 104 degrees 37 minutes 48.0 seconds W; UTM Zone: 13; UTM Easting: 535687 meters; UTM Northing: 3318597 meters.

7 Location of Decoty; USGS topographic quadrangle: Puerto Potrillo; Latitude: 29 degrees 49 minutes 18 seconds N; Longitude: 103 degrees 54 minutes 58.0 seconds W; UTM Zone: 13; UTM Easting: 604724 meters; UTM Northing: 3299518 meters.

8 Location of Marfa; USGS topographic quadrangle: Marfa; Latitude: 30 degrees 19 minutes 9.4 seconds N; Longitude: 104 degrees 01 minutes 46.4 seconds W; UTM Zone: 13; UTM Easting: 593298 meters; UTM Northing: 3354564 meters.

9 Location of Martillo; USGS topographic quadrangle: McKinney Mountain; Latitude: 29 degrees 48 minutes 4.87 seconds N; Longitude: 103 degrees 49 minutes 3.56 seconds W; UTM Zone: 13; UTM Easting: 614265 meters; UTM Northing: 3297360 meters.

10 Location of Melado; USGS topographic quadrangle: Arroyo Melado; Latitude: 29 degrees 40 minutes 19.19 seconds N; Longitude: 104 degrees 28 minutes 49.27 seconds W; UTM Zone: 13; UTM Easting: 550283 meters; UTM Northing: 3282554 meters.

11 Location of Nillo; USGS topographic quadrangle: McKinney Mountain; Latitude: 29 degrees 46 minutes 26.08 seconds N; Longitude: 103 degrees 48 minutes 5.92 seconds W; UTM Zone: 13; UTM Easting: 615844 meters; UTM Northing: 3294335 meters.

12 Location of Ojinaga; USGS topographic quadrangle: Arroyo Melado; Latitude: 29 degrees 42 minutes 35.66 seconds N; Longitude: 104 degrees 23 minutes 9.93 seconds W; UTM Zone: 13; UTM Easting: 559382 meters; UTM Northing: 3286799 meters.

13 Location of Sauceda; USGS topographic quadrangle: Puerto Potrillo; Latitude: 29 degrees 45 minutes 29.29 seconds N; Longitude: 103 degrees 54 minutes 56.04 seconds W; UTM Zone: 13; UTM Easting: 604847 meters; UTM Northing: 3292478 meters.

14 Location of Terlingua; USGS topographic quadrangle: Manzanillo Canyon; Latitude: 29 degrees 30 minutes 49.12 seconds N; Longitude: 104 degrees 06 minutes 37.26 seconds W; UTM Zone: 13; UTM Easting: 586222 meters; UTM Northing: 3265225 meters.

15 Location of Terlingua; USGS topographic quadrangle: Cerro Redondo; Latitude: 29 degrees 30 minutes 38.43 seconds N; Longitude: 104 degrees 07 minutes 35.55 seconds W; UTM Zone: 13; UTM Easting: 584655 meters; UTM Northing: 3264884 meters.

Table 34.--Chemical Analyses of Selected Soils

(Dashes indicate analyses were not made. Footnotes indicate lab analyses and location of pedons.)

Soil name and sample number	Depth	Horizon	pH 1:1 (soil: water)	Organic Carbon	Extractable bases				Sum of Bases	Cation Exchange capacity (NH_4OAC) (pH 7)	Base Saturation (NH_4OAC) (Sum)	Calcium Carbonate Equivalent	Calcite	Dolomite	Gypsum	Electrical Conductivity	Exchangeable Sodium Percentage (ESP)	Sodium Absorption Ratio (SAR)
					Ca	Mg	K	Na										
	In		pH	Pct	---------- Meq/100gm ----------						Pct	Pct	Pct	Pct	Pct	dS/m		
Baviza (4,5)																		
(S08-TX377-008)																		
T083770081	0-2	A	8.3	0.3	---	---	---	---	---	7.6	---	1.8	---	---	0.9	0.4	---	---
T083770082	2-11	Bw	8.4	0.5	---	---	---	---	---	9.4	---	3.0	---	---	1.0	0.4	---	---
T083770083	11-28	C1	8.5	0.5	---	---	---	---	---	9.0	---	5.9	---	---	1.0	0.4	---	---
T083770084	28-40	C2	8.3	0.4	---	---	---	---	---	10.1	---	3.7	---	---	1.1	0.7	---	---
T083770085	40-55	C3	8.6	0.2	---	---	---	---	---	6.1	---	2.2	---	---	0.3	0.4	---	---
Corazones (2,6)																		
(S85-TX377-001)																		
85P03334	0-10	A	8.4	0.7	48.5*	1.7	0.4	0.1	---	8.5	100.0	23.0	---	---	---	---	1.0	---
85P03335	10-29	Bk1	8.4	0.3	44.7*	2.2	0.1	0.1	---	7.4	100.0	25.0	---	---	---	---	1.0	---
85P03336	29-45	Bk2	8.7	0.3	38.4*	3.0	0.2	0.7	---	8.0	100.0	18.0	---	---	---	---	9.0	---
85P03337	45-55	2C	9.1	0.1	38.1*	2.7	0.4	1.2	---	7.7	100.0	11.0	---	---	---	---	16.0	---
Decoty (3,7)																		
(S93-TX377-003)																		
4754	0-5	A	7.5	1.7	42.6	1.1	0.7	0.1	44.5	17.4	100.0	3.5	3.1	0.3	---	---	1.0	---
4755	5-14	Bk	7.5	1.5	46.3	0.7	0.4	0.1	47.5	17.3	100.0	13.2	12.8	0.4	---	---	1.0	---
4756	14-40	Crk	7.6	---	40.9	0.6	0.1	0.2	41.8	8.7	100.0	---	---	---	---	---	2.0	---
Marfa (4,8)																		
(S99-TX377-001a)																		
T993770011	0-3	A	6.5	4.2	---	---	---	---	---	39.9	---	tr	---	---	4.0	0.8	---	---
T993770012	3-13	Bt1	7.4	2.1	---	---	---	---	---	30.5	---	tr	---	---	3.7	0.5	---	---
T993770013	13-24	Bt2	7.4	1.6	---	---	---	---	---	34.1	---	tr	---	---	3.9	0.3	---	---
T993770014	24-41	Bt3	7.7	1.3	---	---	---	---	---	31.9	---	tr	---	---	4.1	0.3	---	---
T993770015	41-55	2Btk1	8.1	1.1	---	---	---	---	---	31.7	---	tr	---	---	3.6	0.4	---	---
T993770016	55-69	2Btk	8.5	1.2	---	---	---	---	---	27.0	---	3.5	---	---	3.0	0.4	---	---
T993770017	69-80	2Bk	8.5	0.8	---	---	---	---	---	29.4	---	8.4	---	---	3.7	0.5	---	---

Table 34.--Chemical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	pH 1:1 (soil: water)	Organic Carbon	Extractable bases Ca	Mg	K	Na	Sum of Bases	Cation Exchange capacity (NH_4OAC) (pH 7)	Base Saturation (NH_4OAC) (Sum)	Calcium Carbonate Equivalent	Calcite	Dolomite	Gypsum	Electrical Conductivity	Exchangeable Sodium Percentage (ESP)	Sodium Absorption Ratio (SAR)
	In		pH	Pct	Meq/100gm						Pct	Pct	Pct	Pct	Pct	dS/m		
Martillo (3, 9)																		
(S93-TX377-004)																		
4757	0-4	A	8.0	0.9	45.5	0.9	3.6	3.8	53.8	49.1	100.0	2.4	2.3	0.1	---	0.6	7.0	9.0
4758	4-12	Bw1	8.1	0.6	54.1	1.1	1.8	9.6	66.6	26.0	100.0	9.3	8.1	1.0	---	2.2	36.0	30.0
4759	12-17	Bw2	7.9	0.8	49.4	1.2	1.7	19.0	71.3	31.5	100.0	7.9	7.6	0.2	---	4.6	48.0	48.0
4760	17-23	2Bw3	8.2	0.4	49.5	0.7	1.9	25.8	77.9	32.0	100.0	7.3	6.0	1.1	---	8.7	64.0	51.0
4761	23-34	2Bz	8.2	0.1	50.4	0.4	1.1	25.7	77.6	30.2	100.0	6.9	5.5	1.3	---	11.4	64.0	35.0
4762	34-44	3Bkz1	8.5	0.3	46.7	0.6	0.7	27.5	75.5	29.3	100.0	6.7	6.0	0.6	---	7.0	78.0	46.0
4763	44-55	3Bkz2	8.6	0.1	43.1	0.4	1.0	22.7	67.2	27.3	100.0	4.7	4.1	0.6	---	6.5	70.0	46.0
4764	55-64	4B'w1	8.5	0.1	44.5	0.4	1.2	21.6	67.7	30.9	100.0	4.0	2.8	1.1	---	8.0	55.0	42.0
4765	64-72	5B'w2	8.7	0.2	46.4	0.5	1.4	22.1	70.4	33.3	100.0	5.5	4.1	1.2	---	4.4	57.0	63.0
4766	72-80	6Bk	8.4	0.2	55.8	0.4	1.2	23.3	80.7	34.1	100.0	10.3	7.7	2.4	---	6.9	53.0	39.0
Melado (3, 10)																		
(S04-TX377-002)																		
6846	0-4	Az	8.2	0.3	56.8	3.6	1.2	47.2	108.8	28.5	100.0	16.9	15.6	1.2	0.8	47.0	78.0	90.0
6847	4-10	Bz1	8.0	0.3	77.0	5.4	1.0	36.0	119.4	27.2	100.0	16.3	15.4	0.8	1.8	39.0	60.0	52.0
6848	10-22	Bz2	7.9	0.3	78.9	5.6	1.0	25.0	110.5	27.5	100.0	16.7	15.4	1.2	2.0	26.0	45.0	37.0
6849	22-35	Bz3	8.1	0.3	55.5	5.5	1.1	23.7	85.8	29.1	100.0	17.1	15.7	1.4	0.6	15.0	45.0	36.0
6850	35-44	Bz4	8.1	0.2	65.6	3.6	0.9	16.0	86.1	25.0	100.0	15.7	14.0	1.5	1.3	13.0	34.0	37.0
6851	44-61	BCz	8.2	0.4	44.5	3.0	0.7	14.0	62.2	15.3	100.0	12.4	11.6	0.7	0.5	12.0	46.0	40.0
6852	61-80	Cyz1	8.5	0.3	67.0	3.7	0.9	29.2	100.8	24.6	100.0	13.6	12.3	1.2	1.3	18.0	87.0	57.0
6853	61-80	Cyz2	8.5	0.1	44.3	1.7	0.5	11.2	57.7	11.1	100.0	8.1	7.3	0.7	1.4	14.0	63.0	47.0
Nillo (3, 11)																		
(S93-TX377-005)																		
4767	0-3	A	8.0	1.3	75.4	1.3	3.3	2.4	82.4	36.8	100.0	6.1	5.0	1.1	---	1.0	6.0	3.0
4768	3-12	C1	8.1	0.4	55.9	0.5	2.3	3.0	61.7	19.2	100.0	4.5	3.6	0.8	---	0.7	15.0	5.0
4769	12-26	C2	8.3	0.5	38.7	0.5	2.4	6.6	48.2	23.1	100.0	4.9	3.8	0.9	---	0.6	27.0	15.0
4770	26-32	Ab	8.3	0.9	34.1	0.5	3.9	6.2	44.7	28.4	100.0	2.7	1.9	0.7	---	0.8	21.0	18.0
4771	32-46	Bwb1	8.4	0.7	35.5	0.5	2.0	6.7	44.7	25.4	100.0	7.8	7.5	0.3	---	0.7	25.0	16.0
4772	46-55	Bwb2	8.5	0.4	35.2	0.8	2.1	9.9	48.0	27.4	100.0	10.5	9.4	0.9	---	0.8	35.0	21.0
4773	55-66	Bwb3	8.8	0.2	33.6	0.5	1.8	8.4	44.3	21.9	100.0	9.5	8.6	0.8	---	1.3	36.0	25.0
4774	66-80	Bkb	8.7	0.3	36.9	0.5	2.0	10.8	50.2	25.6	100.0	9.5	8.2	1.2	---	1.3	39.0	24.0

Table 34.--Chemical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	pH 1:1 (soil: water)	Organic Carbon	Extractable bases Ca	Mg	K	Na	Sum of Bases	Cation Exchange capacity (NH_4OAC) (pH 7)	Base Saturation (NH_4OAC) (Sum)	Calcium Carbonate Equivalent	Calcite	Dolomite	Gypsum	Electrical Conductivity	Exchangeable Sodium Percentage (ESP)	Sodium Absorption Ratio (SAR)
	In		pH	Pct	Meq/100gm						Pct	Pct	Pct	Pct	Pct	dS/m		
Ojinaga (3, 12)																		
(S04-TX377-001)																		
6837	0-5	A	8.5	0.5	41.1	1.3	1.0	0.1	43.5	14.7	100.0	7.3	6.8	0.5	0.0	---	1.0	---
6838	5-12	Bk	8.2	0.6	43.7	0.7	0.3	0.2	44.9	12.6	100.0	35.2	34.7	0.5	0.0	1.0	1.0	1.0
6839	12-16	Bkm1	8.3	0.4	44.5	0.7	0.2	0.2	45.6	8.4	100.0	44.4	43.9	0.5	0.0	---	2.0	---
6840	16-22	Bkm2	8.4	0.2	41.3	0.8	0.4	0.2	42.7	9.6	100.0	25.3	24.9	0.4	0.0	---	2.0	---
6841	22-34	BCk1	8.5	0.2	36.0	0.9	0.2	0.8	37.9	9.4	100.0	14.5	14.1	0.4	0.0	0.5	9.0	2.0
6842	34-49	BCk2	8.8	0.3	41.9	1.1	0.2	3.8	47.0	9.6	100.0	12.2	11.8	0.4	0.0	2.6	32.0	16.0
6843	49-57	CBk1	8.0	0.4	44.3	1.8	0.3	5.1	51.5	10.0	100.0	10.2	9.9	0.3	0.1	7.8	35.0	15.0
6844	57-69	CBk2	8.0	0.5	54.4	2.1	0.3	6.1	62.9	11.0	100.0	15.7	15.3	0.4	0.5	8.3	37.0	15.0
6845	69-80	C	8.1	0.1	27.8	1.5	0.3	4.4	34.0	8.7	100.0	4.1	3.4	0.6	0.0	8.9	34.0	14.0
Sauceda (3, 13)																		
(S93-TX377-002)																		
4752	0-2	A1	7.0	2.8	28.5	1.6	1.4	0.1	31.6	26.0	100.0	---	---	---	---	0.9	0.3	0.3
4753	2-8	A2	7.4	3.1	52.6	1.1	0.7	0.1	54.5	32.0	100.0	5.3	5.0	0.3	---	0.9	0.3	0.3
Terlingua (4, 14)																		
(S08-TX377-595)																		
T083775451	0-3	A1	8.0	0.8	---	---	---	---	---	20.4	---	4.7	---	---	1.2	0.3	---	---
T083775452	3-13	A2	8.1	0.9	---	---	---	---	---	24.1	---	6.3	---	---	1.6	0.6	---	---
Terlingua (4, 15)																		
(S08-TX377-2046)																		
	0-7	A	8.9	1.0	---	---	---	---	---	41.8	---	1.3	---	---	2.5	0.2	---	---

1 Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

2 Analyses by USDA-NRCS National Soil Survey Laboratory, Lincoln, Nebraska.

3 Analyses by Texas A&M University Soil Characterization Laboratory, College Station, Texas.

4 Analyses by Texas Tech University Soil Characterization Laboratory, Lubbock, Texas.

Table 34.--Chemical Analyses of Selected Soils--Continued

5 Location of Baviza; USGS topographic quadrangle: Adobes; Latitude: 29 degrees 51 minutes 44.21 seconds N; Longitude: 104 degrees 34 minutes 31.90 seconds W; UTM Zone: 13; UTM Easting: 540996 meters; UTM Northing: 3303601 meters.

6 Location of Corazones; USGS topographic quadrangle: Las Conchas; Latitude: 29 degrees 59 minutes 52.0 seconds N; Longitude: 104 degrees 37 minutes 48.0 seconds W; UTM Zone: 13; UTM Easting: 535687 meters; UTM Northing: 3318597 meters.

7 Location of Decoty; USGS topographic quadrangle: Puerto Potrillo; Latitude: 29 degrees 49 minutes 18.0 seconds N; Longitude: 103 degrees 54 minutes 58.0 seconds W; UTM Zone: 13; UTM Easting: 604728 meters; UTM Northing: 3299518 meters.

8 Location of Marfa; USGS topographic quadrangle: Marfa; Latitude: 30 degrees 19 minutes 9.4 seconds N; Longitude: 104 degrees 01 minutes 46.4 seconds W; UTM Zone: 13; UTM Easting: 593298 meters; UTM Northing: 3354564 meters.

9 Location of Martillo; USGS topographic quadrangle: McKinney Mountain; Latitude: 29 degrees 48 minutes 4.87 seconds N; Longitude: 103 degrees 49 minutes 3.56 seconds W; UTM Zone: 13; UTM Easting: 614265 meters; UTM Northing: 3297360 meters.

10 Location of Melado; USGS topographic quadrangle: Arroyo Melado; Latitude: 29 degrees 40 minutes 19.19 seconds N; Longitude: 104 degrees 28 minutes 49.27 seconds W; UTM Zone: 13; UTM Easting: 550283 meters; UTM Northing: 3282554 meters.

11 Location of Nillo; USGS topographic quadrangle: McKinney Mountain; Latitude: 29 degrees 46 minutes 26.08 seconds N; Longitude: 103 degrees 48 minutes 5.92 seconds W; UTM Zone: 13; UTM Easting: 615844 meters; UTM Northing: 3294335 meters.

12 Location of Ojinaga; USGS topographic quadrangle: Arroyo Melado; Latitude: 29 degrees 42 minutes 35.66 seconds N; Longitude: 104 degrees 23 minutes 9.93 seconds W; UTM Zone: 13; UTM Easting: 559382 meters; UTM Northing: 3286799 meters.

13 Location of Sauceda; USGS topographic quadrangle: Puerto Potrillo; Latitude: 29 degrees 45 minutes 29.29 seconds N; Longitude: 103 degrees 54 minutes 56.04 seconds W; UTM Zone: 13; UTM Easting: 604847 meters; UTM Northing: 3292478 meters.

14 Location of Terlingua; USGS topographic quadrangle: Manzanillo Canyon; Latitude: 29 degrees 30 minutes 49.12 seconds N; Longitude: 104 degrees 06 minutes 37.26 seconds W; UTM Zone: 13; UTM Easting: 586222 meters; UTM Northing: 3265225 meters.

15 Location of Terlingua; USGS topographic quadrangle: Cerro Redondo; Latitude: 29 degrees 30 minutes 38.43 seconds N; Longitude: 104 degrees 07 minutes 35.55 seconds W; UTM Zone: 13; UTM Easting: 584655 meters; UTM Northing: 3264884 meters.

Table 35.--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
Altar	Loamy-skeletal, mixed, superactive, thermic Ustic Haplocambids
Baviza	Mixed, hyperthermic Ustic Torripsamments
Berrend	Fine-loamy, mixed, superactive, thermic Calcidic Argiustolls
Bissett	Loamy-skeletal, carbonatic, thermic Lithic Ustic Haplocalcids
Blackgap	Loamy-skeletal, carbonatic, hyperthermic Lithic Ustic Haplocalcids
*Bodecker	Loamy-skeletal, mixed, superactive, calcareous, thermic Ustic Torrifluvents
Bodecker	Sandy-skeletal, mixed, thermic Ustic Torrifluvents
Bofecillos	Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents
Boludo	Loamy-skeletal, mixed, superactive, thermic Calcic Lithic Petrocalcids
Boracho	Loamy-skeletal, mixed, superactive, thermic, shallow Petrocalcic Calciustolls
Borunda	Fine, mixed, superactive, thermic Ustic Calcigypsids
Brewster	Loamy-skeletal, mixed, superactive, thermic Aridic Lithic Haplustolls
Buckear	Loamy-skeletal, mixed, superactive, calcareous, thermic, shallow Ustic Torriorthents
Butcherknife	Fine, mixed, superactive, thermic Ustic Calcigypsids
Castolon	Fine-silty, mixed, superactive, calcareous, hyperthermic Ustic Torrifluvents
Catto	Loamy-skeletal, mixed, active, nonacid, thermic Lithic Ustic Torriorthents
Chilicotal	Loamy-skeletal, mixed, superactive, thermic Ustic Haplocalcids
Chilimol	Loamy-skeletal, mixed, superactive, thermic Aridic Calciustolls
Chinati	Loamy-skeletal, mixed, superactive, thermic, shallow Petrocalcic Paleustolls
Corazones	Loamy-skeletal, mixed, superactive, hyperthermic Ustic Haplocalcids
Costavar	Loamy-skeletal, mixed, superactive, thermic Aridic Lithic Argiustolls
Coyanosa	Loamy-skeletal, mixed, superactive, nonacid, thermic Lithic Ustic Torriorthents
Decoty	Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplocalcids
Eppenauer	Fine-loamy, mixed, superactive, thermic Aridic Argiustolls
Espy	Loamy, mixed, superactive, thermic, shallow Petrocalcic Calciustolls
Galindo	Clayey over loamy, smectitic over mixed, superactive, calcareous, hyperthermic Ustertic Torrifluvents
*Geefour	Clayey, smectitic, hyperthermic, shallow Leptic Haplogypsids
Geefour	Clayey, smectitic, calcareous, hyperthermic, shallow Ustic Torriorthents
Gemelo	Coarse-loamy, mixed, superactive, thermic Sodic Ustic Haplocambids
Holguin	Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents
Horsetrap	Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplocambids
Kinco	Coarse-loamy, mixed, superactive, thermic Ustic Haplocalcids
Lingua	Loamy-skeletal, mixed, superactive, nonacid, thermic Lithic Ustic Torriorthents
Lomapelona	Coarse-loamy, mixed, superactive, calcareous, hyperthermic Ustic Torrifluvents
Manzanillo	Loamy-skeletal, mixed, superactive, thermic Calcic Lithic Petrocalcids
Marfa	Fine, mixed, superactive, thermic Pachic Argiustolls
Mariscal	Loamy-skeletal, carbonatic, hyperthermic Lithic Ustic Torriorthents
Martillo	Fine, mixed, superactive, thermic Sodic Ustic Haplocambids
Medley	Fine-loamy, mixed, superactive, thermic Pachic Haplustolls
Melado	Fine, smectitic, hyperthermic Sodic Ustic Haplocambids
Murray	Fine-loamy, mixed, superactive, thermic Aridic Calciustolls
*Musgrave	Clayey, mixed, superactive, calcareous, thermic, shallow Ustic Torriorthents
Musquiz	Fine, mixed, superactive, thermic Calcidic Argiustolls
Nillo	Fine-silty, mixed, superactive, calcareous, thermic Ustic Torrifluvents
Nolam	Loamy-skeletal, mixed, superactive, thermic Ustic Calciargids
Ohtwo	Loamy-skeletal, mixed, superactive, thermic Ustic Haplocambids
Ojinaga	Loamy-skeletal, mixed, superactive, hyperthermic, shallow Calcic Petrocalcids

Table 35.--Taxonomic Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Paisano	Loamy-skeletal, carbonatic, thermic, shallow Calcic Petrocalcids
Pantak	Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplargids
*Pantera	Sandy-skeletal, mixed, hyperthermic Ustic Haplogypsids
Pantera	Sandy-skeletal, mixed, hyperthermic Ustic Torrifluvents
Pardo	Loamy-skeletal, mixed, superactive, thermic Lithic Petrocalcic Calciustolls
Phantom	Fine, smectitic, thermic Torrertic Haplustolls
Quadria	Fine, mixed, superactive, thermic Ustic Natrargids
Redford	Loamy-skeletal, mixed, superactive, hyperthermic Lithic Ustic Haplocalcids
Redlight	Loamy-skeletal, mixed, superactive, hyperthermic Lithic Ustic Haplocalcids
Reduff	Loamy-skeletal, mixed, superactive, nonacid, thermic Lithic Ustic Torriorthents
*Rockhouse	Loamy-skeletal, mixed, superactive, thermic Fluventic Haplustolls
Sanmoss	Loamy-skeletal, mixed, superactive, thermic Pachic Haplustolls
Sauceda	Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents
Scotal	Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents
Stillwell	Loamy-skeletal, carbonatic, hyperthermic Sodic Ustic Haplocalcids
Straddlebug	Fine-loamy, mixed, superactive, thermic Sodic Ustic Haplocambids
Strawhouse	Loamy-skeletal, carbonatic, hyperthermic, shallow Calcic Petrocalcids
*Studybutte	Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Ustic Torriorthents
Studybutte	Loamy-skeletal, mixed, superactive, nonacid, hyperthermic Lithic Ustic Torriorthents
Tenneco	Fine-loamy, mixed, superactive, thermic Ustic Haplocambids
Terlingua	Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Ustic Torriorthents
Verhalen	Fine, smectitic, thermic Typic Haplotorrerts
Vicente	Coarse-silty, mixed, superactive, calcareous, hyperthermic Ustic Torrifluvents
Volco	Loamy-skeletal, mixed, superactive, thermic Lithic Calciustolls

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