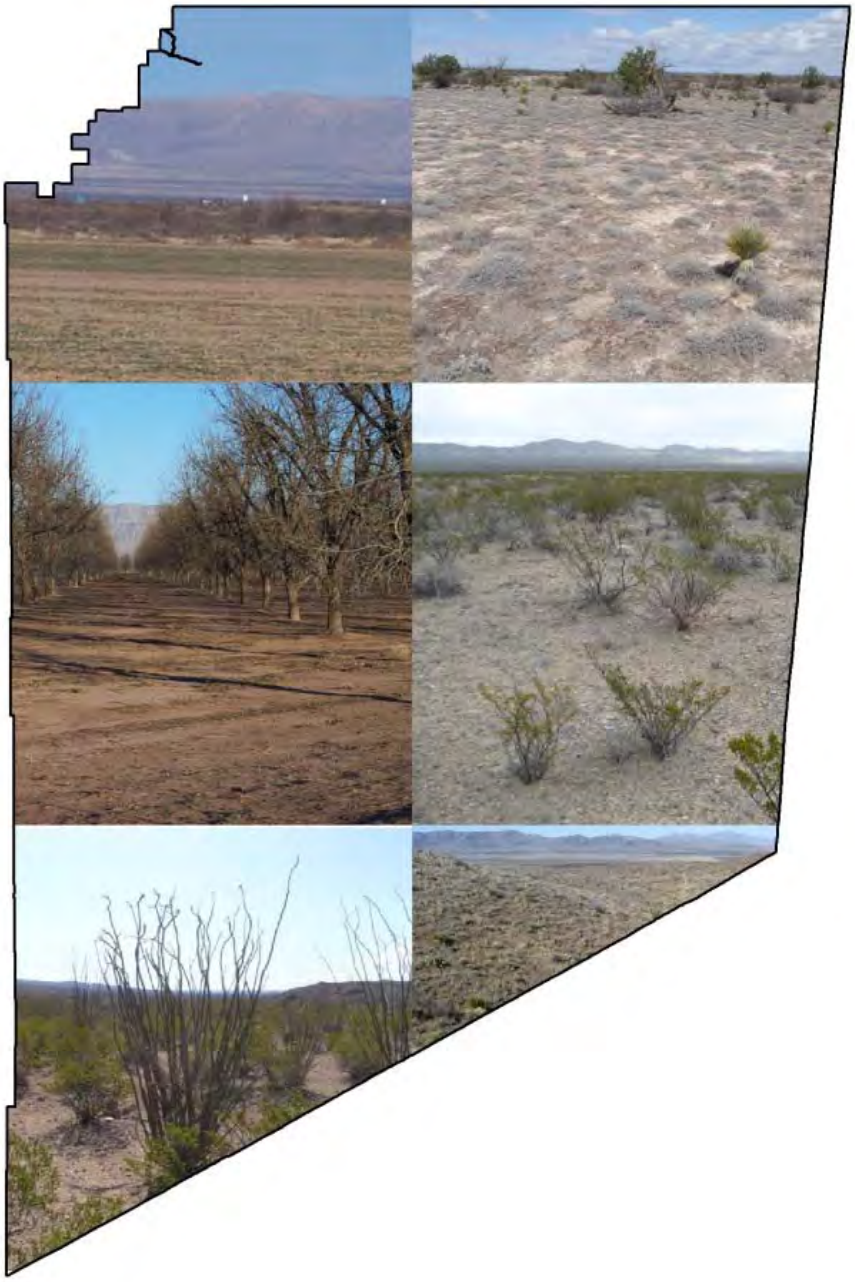
United States Department of Agriculture

In cooperation with Texas AgriLife Research

Natural Resources Conservation Service

Soil Survey of Culberson County, Texas, Main Part



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.

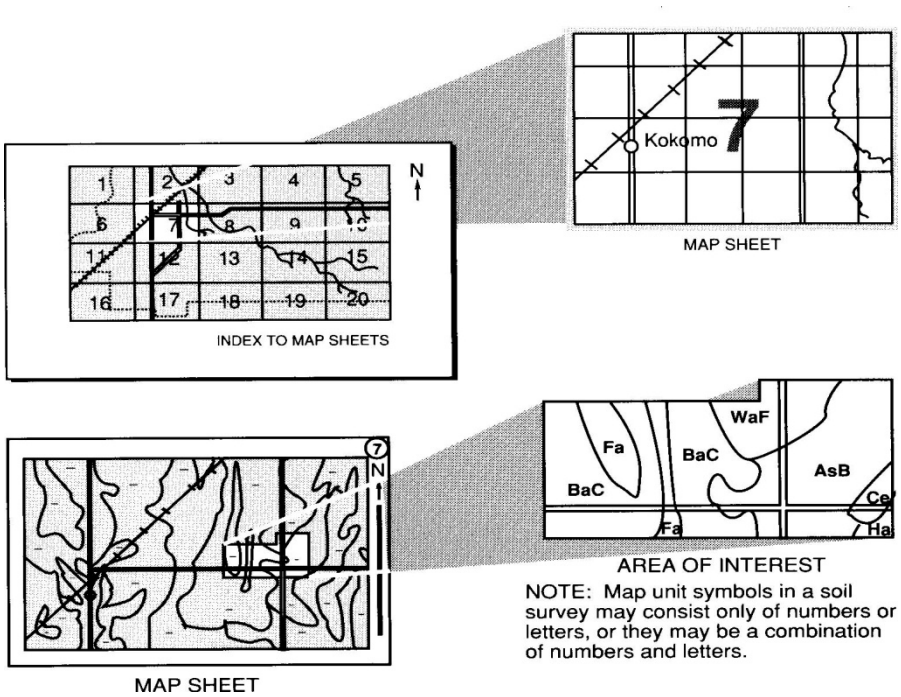
Detailed Soil Maps

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 Toyah-Limpia and High Point Soil and Water Conservation Districts.

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

The recommended citation for this survey is:

United States Department of Agriculture, Natural Resources Conservation Service. 2013. Soil survey of Culberson County, Texas. http://soils.usda.gov/survey/printed_surveys/.

Cover Caption

The cover photo shows the diversity found in Culberson County, Texas. top left photo—mountain range; middle left photo—cropland; lower left photo—hot desert shrub vegetative zone; top right photo—Castille gypsum; middle right photo—alluvial fans; and lower right photo—desert shrub vegetative zone.

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Issued 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 Service.

Salvador Salinas

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State Conservationist
Natural Resources Conservation Service

Soil Survey of Culberson County, Texas (Main Part)

By James A. Clausen, Natural Resources Conservation Service

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

Culberson County is in the Trans-Pecos region of west Texas in the Southern Desertic Basins, Plains, and Mountains Major Land Resource Area (fig.1). It is bound on the north by Eddy County New Mexico, on the east by Reeves County, on the south by Jeff Davis County, and on the west by Hudspeth County.

The total area of Culberson County is 3,723 square miles or 2,382,617 acres. Van Horn is the County seat. Kent, Lobo, Pine Springs, and Plateau are other communities in Culberson County. The population of the County in 2000 was 2,975.

Elevation ranges from 2,900 to 6,600 feet above sea level. The topography of the County ranges from nearly level to rolling plains to some of the highest and most rugged mountains in Texas.

Some of the major drains within Culberson County are the Delaware River, Cottonwood Creek, Salt Creek, Carrizo Creek, Sulfur Creek, and Wild Horse Creek. The major land uses in Culberson County are wildlife habitat, livestock grazing, farming, and recreation. The economy of the County is based primarily on cattle ranching, hunting leases, farming, and the tourism industry. Nearby Guadalupe Mountains National Park, Franklin Mountains State Park, and Hueco Tanks State Historic Site are popular tourist destinations.

General Nature of the Survey Area

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

History

The Guadalupes and the County's other mountains, such as the Delaware, Beach, Wylie, Sierra Diablo, Van Horn, Apache, and Baylor ranges, made the area ideal for Indians seeking protection from their enemies and a remote home base from which to

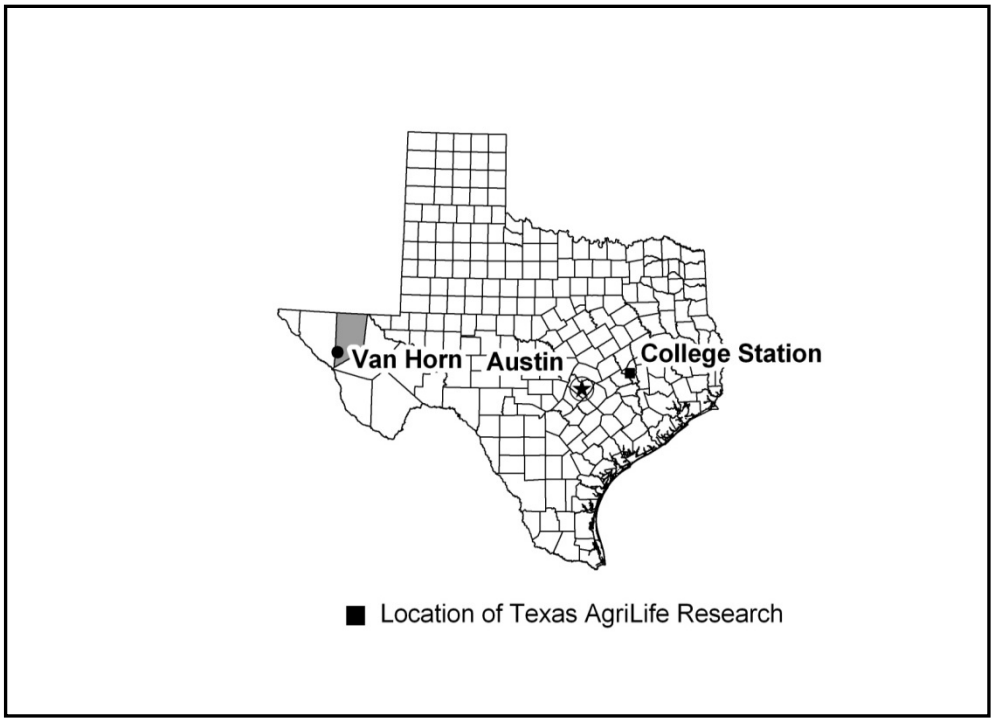

Figure 1.—Location of Culberson County, Texas. College Station is headquarters of Texas AgriLifeResearch. Austin is the capital of Texas.

launch attacks. The earliest sign of human occupation in the area, found in the Guadalupes, is a 12,000-year-old Folsom point. Later, hunter-gatherers probably inhabited the mountains only during the summer; they also left artifacts, as well as pictographs. The most famous indigenous inhabitants of the mountains, the Apaches, arrived about 600 years ago.

The area that was to become Culberson County was largely untouched by Spanish exploration, because of its forbidding topography. In 1583, however, Antonio de Espejo became the first European to see the Mescalero Apaches, on the prairie just east of the Guadalupe Mountains.

By the beginning of the eighteenth century Comanches from the Llano Estacado had ended the Apache domination of western Texas, and the Mescaleros, based in the Guadalupes, restricted their raids to a smaller geographical area.

By the middle of the nineteenth century, however, emigrants were seeking new routes to connect central and eastern Texas with El Paso and California. The 1849 gold rush increased the demand for such roads, and exploration occurred with breathtaking speed. Also in 1849, the Van Horn Wells were supposedly discovered by Major Jefferson Van Horne, en route to El Paso. The wells became known as one of the few dependable water sources in the vast emptiness of West Texas; ten years later the army considered them sufficiently important to establish a cavalry outpost there.

A surveying party under Captain John Pope passed through the area in 1853, seeking a potential railroad route; Pope returned the following year to search in vain for an artesian water supply.

The next phase of exploration involved stagecoaches rather than steel rails. In March 1857 John Butterfield received a contract to carry mail twice a week from St. Louis and Memphis to San Francisco; three months later John Birch received a contract to carry mail semi-monthly from San Antonio to San Diego, California. The first westbound Butterfield coach arrived at the Pinery, a station in the Guadalupes, in late September 1858.

After the civil war the demand for a transcontinental railroad mounted. Before such a project could become a reality, however, the government decided it needed to wipe out the Apaches, who, led by their great chief Victorio, a Warm Springs Apache, and augmented by Mescaleros from the Fort Stanton Reservation, carried out a brilliant raiding campaign in the late 1860s and throughout the 1870s.

In December 1869, Troop F of the Third Cavalry under Lieutenant Howard B. Cushing left Fort Stanton, New Mexico, and entered the Guadalupes in pursuit of the Indians. Cushing's men found two Apache camps and destroyed the Indians' winter stores of food and clothing.

By this time a ranching boom had begun in the Trans-Pecos, and the demand for rangeland for longhorn cattle sealed the fate of the Apaches

In January 1881, a company of rangers under George W. Baylor ambushed the last surviving band of Apache raiders in Bass Canyon in the Sierra Diablo Mountains; it was the last big Indian fight in Texas.

In 1881 the long-awaited railroad link to the West finally became a reality. The Texas and Pacific Railway was building westward from Fort Worth to El Paso. Meanwhile Galveston, Harrisburg, and San Antonio Railway was building eastward from El Paso. In November 1881, they reached an agreement by which the Texas and Pacific Railway would stop at Sierra Blanca, in Hudspeth County, and the two lines would share the track from Sierra Blanca to El Paso Railway.

With the completion of the Texas and Pacific Railway, settlement of the area began in earnest. The towns of Van Horn, Plateau, and Kent grew up along the railroad, and ranchers pushed up into the Guadalupe Mountains. The influx of ranchers continued for the next three decades, and Van Horn grew into a prosperous cattle-shipping center. In 1911 a new County, named after David B. Culberson, was separated from El Paso County. When Culberson County was organized in 1912, Van Horn was chosen as County seat. In 1920 the population of the County was only 912 but the population continued to increase and in 1982 had risen to 3,616.

Extraction of minerals has long been important in Culberson County. Around 1875 an old prospector named Ben Sublett strode into a saloon and casually tossed a buckskin pouch full of gold nuggets onto the bar, hinting broadly that he had discovered them in the Guadalupe Mountains but more recent opinion holds such claims unlikely.

In the late nineteenth century and the mid-twentieth century the Hazel Mine yielded about a million pounds of copper and more than two million ounces of silver. In the 1940s acidic sulfur earth was produced at Rustler Springs, and the Apache Mountains were the site of the largest barite deposit in Texas, which was mined from open pits during the 1960s. A mica quarry operated in the early 1980s in the Van Horn Mountains to mine mica schist, but the sustained production of sheet mica had not been achieved. Culberson County was also producing copper, bedded gypsum from surface mines, brucitic marble, molybdenum, crushed rhyolite, silver, Frasch sulfur, and talc in the 1980s. Oil was discovered in the County in 1953, but annual production was only 320 barrels in 1956. In the late 1950s and early 1960s, however, production soared, reaching 1,289,000 barrels in 1963. Production declined in subsequent years.

Ranching has traditionally been more important than farming in the local economy, although the cattle population in Culberson County decreased between 1920 and the early 1980s. The number of cattle dropped from 48,974 in 1920 to roughly 29,000 in 1982. The number of farms increased from forty-seven in 1920 to seventy in 1982.

Shortage of water has always been a principal obstacle to agriculture in Culberson County. The story of the local cotton industry follows the pattern of farming in general in the County. Culberson County had been the only County in Texas never to produce a bale of cotton, but in 1949 Darwin Brewster grew the first on a 500-acre farm near Lobo. In 1950, 1,295 acres planted with cotton in the County produced 1,114 bales. The County's first cotton gin was built the next year and ginned about 6,000 bales that fall; two more gins were built in subsequent years. In 1959 cotton farmers planted 6,215

acres and produced 11,130 bales. But Culberson County's cotton boom was short-lived, largely because of the water shortage.

With the completion of U.S. Highway 62 in 1926, the increasing viability of automobile travel, and the relative proximity of Carlsbad Caverns in New Mexico, the Big Bend in Presidio County, and the Guadalupe Mountains in northern Culberson County, tourism became increasingly important in the local economy. County employment statistics bear out the increasing importance of tourism. In 1982, 828 Culberson County residents were employed in the service and related industries, while only seventy-three were employed in agriculture. In 1990 the County population was 3,407; Van Horn was the largest community. (Handbook of Texas, 2011)

Natural Resources

The most important natural resources in Culberson County are soil, water, and wildlife.

Sand, gravel, caliche, sulfur, gypsum, and talc are mined. The 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

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

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

In winter, the average temperature is 44 degrees F and the average daily minimum temperature is 29 degrees. The lowest temperature on record, which occurred at Van Horn on January 11, 1962, is -7 degrees. In summer, the average temperature is 77 degrees and the average daily maximum temperature is 91 degrees. The highest temperature, which occurred at Van Horn on June 25, 1969, is 112 degrees.

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

The average annual total precipitation is about 12 inches. Of this, about 10 inches, or 86 percent, usually falls in March through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 7 inches at Van Horn on August 22, 1966. Thunderstorms occur on about 40 days each year, and most occur in July.

The average seasonal snowfall is 3 inches. The greatest snow depth at any one time during the period of record was 7 inches recorded on November 28, 1969 and December 29, 1969. On an average, 1 day per year has at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 9.5 inches recorded on February 6, 1979.

The average relative humidity in mid-afternoon is about 28 percent. Humidity is higher at night, and the average at dawn is about 58 percent. The sun shines 84 percent of the

time in summer and 79 percent in winter. The prevailing wind is from the north. Average wind speed is highest, 10 miles per hour, in April.

How This Survey Was Made

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

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

Commonly, individual soils 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 (Schoeneberger, and others, 2002). They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil

scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

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

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

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 selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Culberspeth-Chilicotal-Double

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

This map unit makes up about 31 percent of the survey area. It is about 18 percent Culberspeth soils, 10 percent Chilicotal soils, 8 percent Double soils, and 64 percent other soils.

Culberspeth soils occur on fan remnants on 1 to 8 percent slopes. They are very shallow or shallow soils that are moderately permeable over a very slowly permeable petrocalcic horizon. Typically, the surface layer is yellowish brown, gravelly loam about 2 inches thick. The subsoil from 2 to 8 inches is light yellowish brown, gravelly loam. The underlying material from 8 to 18 inches is a white, indurated, petrocalcic horizon.

Chilicotal 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, loam about 3 inches thick. The upper subsoil from 3 to 12 inches is brown, gravelly loam. The middle subsoil from 12 to 22 inches is pale brown, gravelly clay loam. The underlying material from 22 to 80 inches is pale brown, extremely gravelly loam.

Double soils occur on alluvial fans on 1 to 8 percent slopes. They are very deep soils that are moderately permeable. Typically, the surface layer is pale brown loam about 4 inches thick. The subsoil from 4 to 23 inches is brown and yellowish brown loam. The underlying material from 23 to 80 inches is yellowish brown, brown, and light brown, clay loam.

Of minor extent are areas of Reyab, Monahans, and McAllister soils, which occur on nearly level to gently sloping flood plains, fan skirts on fan piedmonts, and alluvial fans, respectively.

2. Elcor-Pokorny-Dellahunt

Very shallow, shallow, and very deep, well drained, gypsiferous and nongypsiferous loamy soils

This map unit makes up about 28 percent of the survey area. It is about 17 percent Elcor soils, 16 percent Pokorny soils, 15 percent Dellahunt soils, and 52 percent other soils.

Elcor soils occur on hills on 0 to 2 percent slopes. They are very shallow or shallow soils that are moderately permeable over rock gypsum bedrock. Typically the surface layer is light gray, gypsiferous loam about 3 inches thick. The subsoil from 3 to 7 inches is very pale brown, gypsiferous loam. The underlying material from 7 to 17 inches is white, indurated rock gypsum bedrock.

Pokorny soils occur on alluvial flats and terraces on 0 to 2 percent slopes. They are very shallow or shallow soils that are moderately permeable over a slowly permeable petrogypsic horizon. Typically the surface layer is yellowish brown, loam about 1 inch thick. The upper subsoil from 1 to 6 inches is white, gypsiferous silt loam. The lower subsoil from 6 to 17 inches is white, gypsiferous silty clay loam. The underlying material from 17 to 80 inches is very pale brown and white, weakly to moderately cemented petrogypsic.

Dellahunt soils occur on alluvial flats on 0 to 5 percent slopes. They are very deep soils that are moderately slowly permeable. Typically the surface layer is pale brown, loam about 4 inches thick. The upper subsoil from 4 to 17 inches is brown and yellowish brown, clay loam. The lower subsoil from 17 to 49 inches is very pale brown and yellow, loam and silt loam. The underlying material from 49 to 80 inches is very pale brown and brownish yellow, very fine sandy loam.

Of minor extent are areas of Hollebeke and Bissett soils. They occur on nearly level to very steep low hills, hills, ridges, and mountain slopes.

3. Bissett-Beach-Rock outcrop

Very shallow or shallow, well drained, cobbly soils and areas of exposed limestone and sandstone bedrock

This map unit makes up about 23 percent of the survey area. It is about 33 percent Bissett soils, 16 percent Beach soils, 12 percent rock outcrop, and 39 percent other soils.

Bissett soils occur on hills, ridges, and mountain slopes on 3 to 70 percent slopes. They are very shallow or shallow soils that are moderately rapidly permeable over limestone bedrock. Typically, the surface layer is brown, very cobbly loam about 2 inches thick. The subsoil from 2 to 9 inches is pale brown, very cobbly loam. The underlying material from 9 to 19 inches is indurated, limestone bedrock.

Beach soils occur on hills and low hills on 3 to 70 percent slopes. They are very shallow or shallow soils that are moderately permeable over sandstone bedrock. Typically, the surface layer is brown, very cobbly sandy loam about 9 inches thick. The underlying material from 9 to 19 inches is indurated, sandstone bedrock.

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

Of minor extent are areas of Reyab, Culberspeth, Chilicotal, and Allamore soils. They occur on nearly level to very steep flood plains, fan remnants, and hills.

4. Beach-Allamore-Rock outcrop, moist

Very shallow or shallow, well drained, gravelly and channery soils and areas of exposed sandstone and limestone bedrock

This map unit makes up about 9 percent of the survey area. It is about 39 percent Beach soils, 25 percent Allamore soils, 7 percent Rock outcrop, and 29 percent other soils.

Beach soils occur on hills and low hills on 3 to 70 percent slopes. They are very shallow or shallow soils that are moderately permeable over sandstone bedrock. Typically, the surface layer is brown, very channery loam about 9 inches thick. The underlying material from 9 to 19 inches is indurated, sandstone bedrock.

Allamore soils occur on hills on 5 to 70 percent slopes. They are very shallow or shallow soils that are moderately permeable over limestone bedrock. Typically, the surface layer is grayish brown, very gravelly loam about 8 inches thick. The subsurface layer from 8 to 17 inches is pale brown, very gravelly loam. The underlying material from 17 to 27 inches is indurated, limestone bedrock.

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

Of minor extent are areas of Tenneco soils. They occur on nearly level to moderately steep fan piedmonts and alluvial fans.

5. Bissett-Rock outcrop-Culberspeth, moist

Very shallow or shallow, well drained, gravelly and cobbly soils and areas of exposed limestone bedrock

This map unit makes up about 3 percent of the survey area. It is about 66 percent Bissett soils, 19 percent rock outcrop, 3 percent Culberspeth soils, and 12 percent other soils.

Bissett soils occur on hills, ridges, and mountain slopes on 3 to 70 percent slopes. They are very shallow or shallow soils that are moderately rapidly permeable over limestone bedrock. Typically, the surface layer is brown, very cobbly loam about 2 inches thick. The subsoil from 2 to 9 inches is pale brown, very cobbly loam. The underlying material from 9 to 19 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.

Culberspeth soils occur on fan remnants on 1 to 8 percent slopes. They are very shallow or shallow soils that are moderately permeable over a very slowly permeable petrocalcic horizon. Typically, the surface layer is yellowish brown, gravelly loam about 2 inches thick. The subsoil from 2 to 8 inches is light yellowish brown, gravelly loam. The underlying material from 8 to 18 inches is white, indurated petrocalcic.

Of minor extent are areas of Yarbam soils which occur on steep to very steep mountain slopes.

6. Yesum-Corvus-Peligro

Very shallow, shallow, and very deep, well drained, gypsiferous and nongypsiferous loamy soils

This map unit makes up about 3 percent of the survey area. It is about 22 percent Yesum soils, 21 percent Corvus soils, 13 percent Peligro soils, and 44 percent other soils.

Yesum soils occur on alluvial flats and relict stabilized gypsum dunes on 0 to 8 percent slopes. They are very deep soils that are moderately permeable. Typically, the surface is very pale brown, fine sandy loam that is 2 inches thick. The subsurface layer from 2 to 7 inches is very pale brown, coarse sandy loam. The underlying material from 7 to 80 inches is very pale brown and white, gypsiferous coarse sandy loam and loam.

Corvus soils occur on relict stabilized gypsum dunes and alluvial flats on 0 to 5 percent slopes. They are very shallow and shallow soils that are moderately permeable over a very slowly permeable petrogypsic horizon. Typically, the surface is very pale brown, gypsiferous loam that is 6 inches thick. The subsurface layer from 6 to 9 inches is very pale brown, very strongly cemented petrogypsic. The underlying material from 9 to 80 inches is very pale brown and white, gypsiferous loam.

Peligro soils occur on relict stabilized gypsum dunes on 1 to 8 percent slopes. They are very deep soils that are moderately permeable. Typically, the surface is pale brown,

fine sandy loam that is 1 inch thick. The underlying material from 1 to 80 inches is white and very pale brown, gypsiferous coarse sand.

Of minor extent are areas of Lark, Monahans, Loki, and Gypsic Aquisalids soils. They occur on nearly level to moderately steep lunette playa dunes, fan skirts on fan piedmonts, alluvial flats, and basin floors, respectively.

7. Pantak-Bofecillos-Horsetrap

Very shallow or shallow, well drained, gravelly soils

This map unit makes up about 2 percent of the survey area. It is about 25 percent Pantak soils, 16 percent Bofecillos soils, 8 percent Horsetrap soils, and 51 percent other soils.

Pantak soils occur on hills on 10 to 60 percent slopes. They are very shallow or shallow soils that are moderately permeable over igneous bedrock. Typically the surface layer is brown, very gravelly coarse sandy loam about 4 inches thick. The subsurface layer from 4 to 8 inches is brown, very cobbly sandy clay loam. The underlying material from 8 to 18 inches is indurated, igneous bedrock.

Bofecillos soils occur on hills and low hills on 1 to 30 percent slopes. They are very shallow soils that are moderately slowly permeable over basalt bedrock. Typically the surface layer is dark yellowish brown, very gravelly sandy loam about 9 inches thick. The underlying material from 9 to 19 inches is indurated, basalt bedrock.

Horsetrap soils occur on hills on 10 to 30 percent slopes. They are shallow soils that are moderately slowly permeable over basalt bedrock. Typically the surface layer is brown, gravelly sandy loam about 9 inches thick. The subsurface layer from 9 to 16 inches is dark yellowish brown, very gravelly sandy loam. The underlying material from 16 to 26 inches is indurated, basalt bedrock.

Of minor extent are areas of Leyva soils which occur on nearly level to steep hills and low hills.

8. Ojinaga-Corazones-Changas

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

This map unit makes up less than 1 percent of the survey area. It is about 38 percent Ojinaga soils, 28 percent Corazones soils, 9 percent Changas soils, and 25 percent other soils.

Ojinaga soils occur on fan remnants on 1 to 5 percent slopes. They are very shallow or shallow soils that are moderately rapidly permeable over a very slowly permeable petrocalcic horizon. Typically, the surface layer is very pale brown, gravelly loam about 3 inches thick. The next layer from 3 to 10 inches is light yellowish brown, very gravelly sandy clay loam. The underlying material from 10 to 20 inches is white, strongly cemented petrocalcic.

Corazones soils occur on fan remnants on 1 to 40 percent slopes. They are very deep soils that are moderately rapidly permeable. Typically, the surface layer is very pale brown, very gravelly fine sandy loam about 3 inches thick. The underlying material from 3 to 80 inches is very pale brown, extremely gravelly fine sandy loam.

Changas soils occur on erosional fan remnants on 5 to 30 percent slopes. They are very deep soils that are very slowly permeable. Typically, the surface layer is yellowish brown, sandy clay loam about 4 inches thick. The underlying material from 4 to 80 inches is yellowish brown, brown, and pale brown, clay.

Of minor extent are areas of Chillon and Pantera soils, which occur on nearly level to gently sloping stream terraces and arroyos, respectively.

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

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Bissett-Rock outcrop complex, 10 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. Verhalen-Dalby association, 0 to 1 percent slopes, rarely flooded, is an example.

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

Table 4 provides the acreage and proportionate extent of each map unit in the survey area. Other tables provide properties of the soils and the limitations, capabilities, and potentials for many uses.

Composition estimates of the soils are 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 recogonized 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.

AAD—Aguena loamy fine sand, 1 to 10 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Aguena and similar soils: 90 percent
Minor components: 10 percent
Unnamed soils occur throughout the unit: 10 percent

Soil Description

Aguena

Landforms: Dunes
Down-slope shape: Convex, linear

Across-slope shape: Convex
Parent material: Eolian sands derived from mixed sources

Typical Profile

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

Properties and Qualities

Slope: 1 to 10 percent
Percent of area covered by surface fragments: About 1 percent 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 5 inches (low)
Natural drainage class: Excessively drained
Runoff: Very low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Sand Hills, Desert Grassland
Ecological site number: R042XC756TX
Typical vegetation: Giant dropseed, sand dropseed, spike dropseed, mesa dropseed, black grama, other perennial grasses, other shrubs, plains bristlegrass, sideoats grama, western honey mesquite, fourwing saltbush, other forbs, sand sagebrush, croton, javelinabush, soaptree yucca

ABE—Allamore-Beach-Rock outcrop complex, 5 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 97 percent
Allamore and similar soils: 57 percent
Beach and similar soils: 23 percent
Rock outcrop and similar soils: 17 percent
Minor components: 3 percent
Chilicotal soils are very deep and are in lower positions: 2 percent
Unnamed soils occur throughout the unit: 1 percent

Soil Description

Allamore

Landforms: Hills

Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from metamorphic sandstone

Typical Profile

A—0 to 8 inches; slightly alkaline very gravelly loam
Bk—8 to 19 inches; slightly alkaline very cobbly loam
R—19 to 29 inches; sandstone bedrock

Properties and Qualities

Slope: 5 to 30 percent
Percent of area covered by surface fragments: About 15 percent subrounded cobbles, about 35 percent 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 below the 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 inches (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: Not flooded

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, other perennial grasses, sand dropseed, Arizona cottontop, Hall's panicum, other perennial forbs, other shrubs, slim triden, spike dropseed, range ratany, skeletonleaf goldeneye, Ephedra, lechuguilla

Beach

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from metamorphic sandstone

Typical Profile

A—0 to 9 inches; neutral very cobbly sandy loam
R—9 to 19 inches; sandstone bedrock

Properties and Qualities

Slope: 5 to 30 percent
Percent of area covered by surface fragments: About 30 percent subrounded gravel, about 25 percent subrounded cobbles
Depth to first restrictive layer: 4 to 12 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 below the 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: Not flooded

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, other perennial grasses, sand dropseed, Arizona cottontop, Hall's panicum, other perennial forbs, other shrubs, slim triden, spike dropseed, range ratany, skeletonleaf goldeneye, Ephedra, lechuguilla

Rock outcrop

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Very dense metamorphic sandstone

Typical Profile

R—0 to 10 inches; sandstone bedrock

Properties and Qualities

Slope: 5 to 30 percent
Depth to first restrictive layer: No restrictive layer
Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

ABG—Allamore-Beach-Rock outcrop complex, moist, 20 to 70 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days

Composition Estimates

Major components: 95 percent
Allamore moist and similar soils: 40 percent
Beach moist and similar soils: 40 percent
Rock outcrop and similar soils: 15 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Soil Description

Allamore, moist

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from limestone

Typical Profile

A—0 to 8 inches; slightly alkaline very gravelly loam
Bk—8 to 17 inches; slightly alkaline very gravelly loam
R—17 to 27 inches; limestone bedrock

Properties and Qualities

Slope: 20 to 70 percent
Percent of area covered by surface fragments: About 15 percent subrounded cobbles, about 35 percent subrounded 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 below the 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 inches (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill, Dry Mixed Prairie
Ecological site number: R042XD744TX
Typical vegetation: Black grama, sideoats grama, blue grama, sand dropseed, Warnock's grama, hairy grama, New Mexico feathergrass, other forbs, other perennial grasses, other shrubs, cholla, skeletonleaf goldeneye, winterfat

Beach, moist

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from non-metamorphic sandstone

Typical Profile

A—0 to 9 inches; neutral very channery loam
R—9 to 19 inches; sandstone bedrock

Properties and Qualities

Slope: 20 to 70 percent
Percent of area covered by surface fragments: About 13 percent subangular channers, about 12 percent subangular cobbles, about 13 percent subrounded channers, about 12 percent subrounded cobbles
Depth to first restrictive layer: 3 to 19 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 below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Sandstone Hill, Dry Mixed Prairie
Ecological site number: R070DY755TX
Typical vegetation: Black grama, sideoats grama, blue grama, sand dropseed, Warnock's grama, hairy grama, New Mexico feathergrass, other forbs, other perennial grasses, other shrubs, cholla, skeletonleaf goldeneye, winterfat

Rock outcrop

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Very dense non-metamorphic sandstone, coarsely-fractured limestone

Typical Profile

R—0 to 10 inches; limestone bedrock, sandstone bedrock

Properties and Qualities

Slope: 20 to 70 percent
Depth to first restrictive layer: No restrictive layer
Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

ANB—Antbed loam, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 85 percent
Antbed and similar soils: 85 percent
Minor components: 15 percent
McAllister soils have less clay and are in slightly higher positions: 10 percent
Reyab soils have less clay and are in lower positions: 2 percent
Unnamed soils occur throughout the unit: 3 percent

Soil Description

Antbed

Landforms: Alluvial flats
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous rock

Typical Profile

Ap—0 to 4 inches; neutral loam
Bt—4 to 17 inches; slightly alkaline clay loam
Btk—17 to 80 inches; moderately alkaline clay

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: 0.2 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 inches (high)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Figure 2.—An area of Antbed loam, 0 to 3 percent slopes. Antbed soils are on alluvial flats.

Interpretive Groups

Land capability nonirrigated: 6e (fig. 2)
Land capability irrigated: 2e
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC007NM
Typical vegetation: Blue grama, tobosa, black grama, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, tarbush

BBC—Beach very cobbly sandy loam, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 85 percent
Beach and similar soils: 85 percent
Minor components: 15 percent
Bissett soils are shallow to limestone bedrock and are in similar positions: 2 percent

Chilicotal soils are very deep and are in lower positions: 2 percent
Unnamed soils occur throughout the unit: 11 percent

Soil Description

Beach

Landforms: Low hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from sandstone

Typical Profile

A—0 to 9 inches; neutral very cobbly sandy loam
R—9 to 19 inches; sandstone bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 10 percent subrounded medium and coarse gravel, about 10 percent rounded gravel, about 10 percent subangular cobbles
Depth to first restrictive layer: 4 to 13 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: Sandstone Hill and Mountain, Desert Grassland
Ecological site number: R042XC255TX
Typical vegetation: Black grama, sideoats grama, other perennial grasses, sand dropseed, Arizona cottontop, Hall's panicum, other perennial forbs, other shrubs, slim triden, spike dropseed, range ratany, skeletonleaf goldeneye, Ephedra, lechuguilla

BBD—Beach very gravelly coarse sandy loam, 5 to 16 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 80 percent
Beach and similar soils: 80 percent

Minor components: 20 percent
Culberspeth soils have a petrocalcic horizon and are in lower positions: 8 percent
Chispa soils are very deep and are in lower positions: 3 percent
Rock outcrop: 3 percent
Kinco soils are very deep and are in lower positions: 2 percent
Bissett soils are shallow to limestone bedrock and are in similar positions: 1 percent
Unnamed soils occur throughout the unit: 3 percent

Soil Description

Beach

Landforms: Low hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from non-metamorphic sandstone

Typical Profile

A—0 to 9 inches; neutral very gravelly coarse sandy loam
R—9 to 19 inches; sandstone bedrock

Properties and Qualities

Slope: 5 to 16 percent
Percent of area covered by surface fragments: About 30 percent subrounded gravel, about 25 percent subrounded cobbles
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 below the 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Sandstone Hill and Mountain, Desert Grassland (fig. 3)
Ecological site number: R042XC255TX
Typical vegetation: Black grama, sideoats grama, other perennial grasses, sand dropseed, Arizona cottontop, Hall's panicum, other perennial forbs, creosotebush and other shrubs, slim triden, spike dropseed, range ratany, skeletonleaf goldeneye, Ephedra, lechuguilla

BCE—Beach-Allamore complex, moist, 5 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains

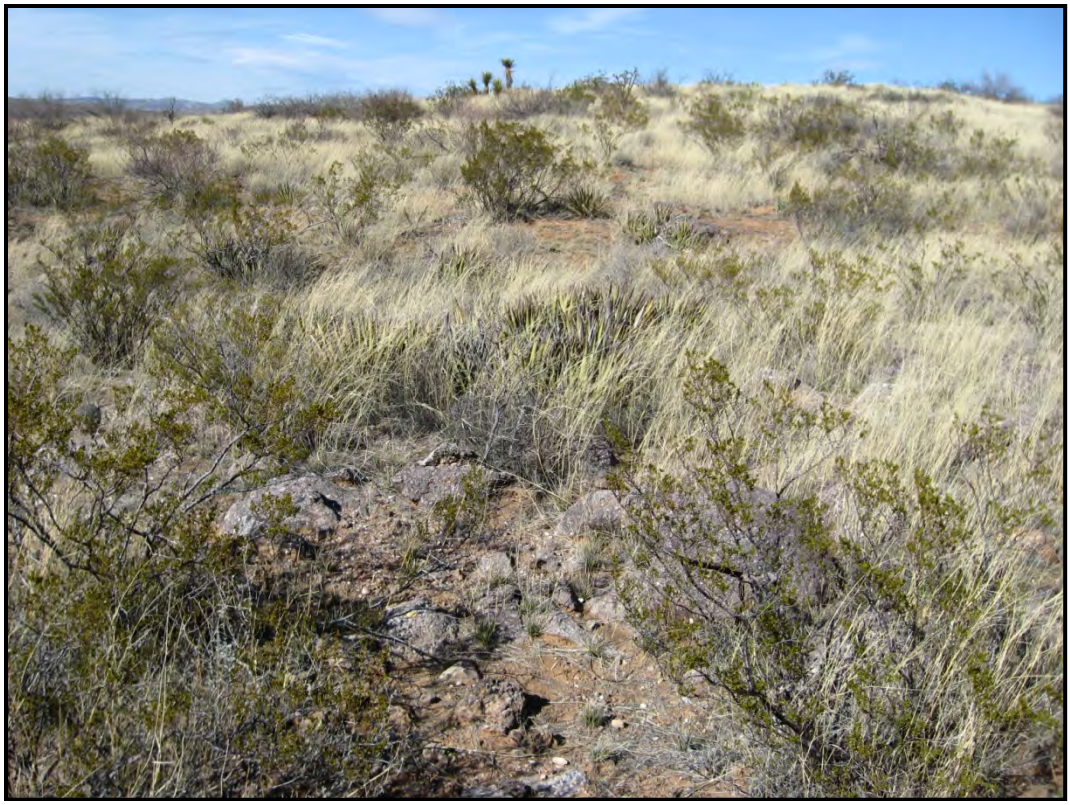

Figure 3.—An area of Beach very gravelly coarse sandy loam, 5 to 16 percent slopes. Vegetation consists of sideoats grama, black grama, creosotebush, and lechuguilla. Beach soils are in the Sandstone Hill and Mountain ecological site, Desert Grassland vegetative zone.

Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days

Composition Estimates

Major components: 85 percent
Beach moist soils and similar soils: 45 percent
Allamore moist soils and similar soils: 40 percent
Minor components: 15 percent
Culberspeth moist soils have a petrocalcic horizon and are in lower positions: 3 percent
Tenneco moist soils are very deep and are in lower positions: 2 percent
Rock outcrop: 2 percent
Unnamed soils occur throughout the unit: 8 percent

Soil Description

Beach soils, moist

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from sandstone

Typical Profile

A—0 to 6 inches; slightly alkaline very channery loam
R—6 to 16 inches; sandstone bedrock

Properties and Qualities

Slope: 5 to 30 percent
Percent of area covered by surface fragments: About 45 percent angular channers, about 15 percent angular flagstones
Depth to first restrictive layer: 4 to 13 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 0.6 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Sandstone Hill, Dry Mixed Prairie
Ecological site number: R070DY755TX
Typical vegetation: Black grama, sideoats grama, blue grama, sand dropseed, Warnock's grama, hairy grama, New Mexico feathergrass, other forbs, other perennial grasses, other shrubs, cholla, skeletonleaf goldeneye, winterfat

Allamore soils, moist

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from limestone

Typical Profile

A—0 to 7 inches; moderately alkaline very gravelly loam
Bk—7 to 9 inches; moderately alkaline very gravelly loam
R—9 to 19 inches; limestone bedrock

Properties and Qualities

Slope: 5 to 30 percent
Percent of area covered by surface fragments: About 10 percent subrounded cobbles, about 55 percent subrounded gravel
Depth to first restrictive layer: 8 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: 0.06 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 inch (very low)
Natural drainage class: Well drained

Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill, Dry Mixed Prairie
Ecological site number: R042XD744TX
Typical vegetation: Black grama, sideoats grama, blue grama, sand dropseed, Warnock's grama, hairy grama, New Mexico feathergrass, other forbs, other perennial grasses, other shrubs, cholla, skeletonleaf goldeneye, winterfat

BCG—Beach-Allamore-Rock outcrop complex, 20 to 70 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 76 percent
Beach and similar soils: 35 percent
Allamore and similar soils: 22 percent
Rock outcrop and similar soils: 19 percent
Minor components: 24 percent
Chilicotal soils are very deep and are in lower positions: 2 percent
Unnamed soils occur throughout the unit: 22 percent

Soil Description

Beach

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from metamorphic sandstone

Typical Profile

A—0 to 5 inches; neutral very cobbly sandy loam
R—5 to 15 inches; sandstone bedrock

Properties and Qualities

Slope: 20 to 60 percent
Percent of area covered by surface fragments: About 30 percent subrounded gravel, about 25 percent subrounded cobbles
Depth to first restrictive layer: 4 to 12 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 below the 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

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, other perennial grasses, sand dropseed, Arizona cottontop, Hall's panicum, other perennial forbs, other shrubs, slim triden, spike dropseed, range ratany, skeletonleaf goldeneye, Ephedra, lechuguilla

Allamore

Landforms: Hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from metamorphic sandstone

Typical Profile

A—0 to 4 inches; moderately alkaline very gravelly loam
Bk—4 to 11 inches; moderately alkaline extremely gravelly fine sandy loam
R—11 to 21 inches; sandstone bedrock

Properties and Qualities

Slope: 20 to 60 percent
Percent of area covered by surface fragments: About 15 percent subrounded cobbles, about 35 percent 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 below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

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, other perennial grasses, sand dropseed, Arizona cottontop, Hall's panicum, other perennial forbs, other shrubs, slim triden, spike dropseed, range ratany, skeletonleaf goldeneye, Ephedra, lechuguilla

Rock outcrop

Landforms: Hills
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Very dense metamorphic sandstone

Typical Profile

R—0 to 10 inches; sandstone bedrock

Properties and Qualities

Slope: 20 to 70 percent
Depth to first restrictive layer: No restrictive layer
Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

BED—Beach-Tenneco complex, moist, 3 to 16 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days

Composition Estimates

Major components: 90 percent
Beach moist and similar soils: 65 percent
Tenneco moist and similar soils: 25 percent
Minor components: 10 percent
Unnamed soils occur throughout the unit: 10 percent

Soil Description

Beach soils, moist

Landforms: Low hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from non-metamorphic sandstone

Typical Profile

A—0 to 10 inches; neutral very gravelly loam
R—10 to 20 inches; sandstone bedrock

Properties and Qualities

Slope: 3 to 16 percent
Percent of area covered by surface fragments: About 13 percent subangular channers, about 12 percent subangular cobbles, about 13 percent subrounded channers, about 12 percent subrounded cobbles
Depth to first restrictive layer: 3 to 19 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 below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Sandstone Hill, Dry Mixed Prairie
Ecological site number: R070DY755TX
Typical vegetation: Black grama, sideoats grama, blue grama, sand dropseed, Warnock's grama, hairy grama, New Mexico feathergrass, other forbs, other perennial grasses, other shrubs, cholla, skeletonleaf goldeneye, winterfat

Tenneco soils, moist

Landforms: Fan piedmonts
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from mixed sources

Typical Profile

A—0 to 10 inches; moderately alkaline loam
Bw—10 to 17 inches; moderately alkaline clay loam
Bk—17 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 3 to 16 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 11 inches (high)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Loamy, Dry Mixed Prairie
Ecological site number: R042XD001NM
Typical vegetation: Blue grama, tobosa, cane bluestem, sideoats grama, other perennial grasses, alkali sacaton, Arizona cottontop, vine mesquite, other forbs, burrograss, ear muhly, other shrubs

BHE—Bissett-Beach complex, 10 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 88 percent
Bissett and similar soils: 66 percent
Beach and similar soils: 22 percent
Minor components: 12 percent
Rock outcrop: 6 percent
Culberspeth soils have a petrocalcic horizon and are in lower positions: 3 percent
Unnamed soils occur throughout the unit: 3 percent

Soil Description

Bissett

Landforms: Hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from limestone

Typical Profile

A—0 to 6 inches; moderately alkaline very gravelly loam
Bk—6 to 13 inches; moderately alkaline very gravelly loam
R—13 to 23 inches; limestone bedrock

Properties and Qualities

Slope: 10 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: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability below the 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 2 inches (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

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, slim triden, other forbs, other perennial grasses, other shrubs, Arizona cottontop, threeawn, feather pappusgrass, fluffgrass, range ratany, lechuguilla, creosotebush, skeletonleaf goldeneye

Beach

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from non-metamorphic sandstone

Typical Profile

A—0 to 11 inches; neutral very gravelly silt loam
R—11 to 21 inches; sandstone bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 50 percent subangular gravel, about 8 percent subrounded cobbles
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 below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

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, other perennial grasses, sand dropseed, Arizona cottontop, Hall's panicum, other perennial forbs, other shrubs, slim triden, spike dropseed, range ratany, skeletonleaf goldeneye, Ephedra, lechuguilla

BID—Bissett-Rock outcrop complex, 3 to 16 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Hills
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Bissett and similar soils: 65 percent
Rock outcrop and similar soils: 25 percent
Minor components: 10 percent
Chispa soils are very deep and are in lower positions: 4 percent
Culberspeth soils have a petrocalcic horizon and are in lower positions: 3 percent
Reyab soils are very deep and are in lower positions: 3 percent

Soil Description

Bissett

Landforms: Ridges
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from limestone

Typical Profile

A—0 to 4 inches; moderately alkaline very gravelly loam
Bk—4 to 17 inches; moderately alkaline very gravelly loam
R—17 to 27 inches; limestone bedrock

Properties and Qualities

Slope: 3 to 16 percent
Percent of area covered by surface fragments: About 15 percent subrounded cobbles, about 35 percent subrounded gravel
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 below the 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 2 inches (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: Not flooded

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, slim triden, other forbs, other perennial grasses, other shrubs, Arizona cottontop, threeawn, feather pappusgrass, fluffgrass, range ratany, lechuguilla, creosotebush, skeletonleaf goldeneye

Rock outcrop

Landforms: Ridges
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarsely-fractured limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 8 to 16 percent
Depth to first restrictive layer: No restrictive layer
Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

BIE—Bissett-Rock outcrop complex, 10 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Hills
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 95 percent
Bissett and similar soils: 65 percent
Rock outcrop and similar soils: 30 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Soil Description

Bissett

Landforms: Ridges
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from limestone

Typical Profile

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

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 15 percent subrounded cobbles, about 35 percent subrounded gravel
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 below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

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, slim triden, other forbs, other perennial grasses, other shrubs, Arizona cottontop, threeawn, feather pappusgrass, fluffgrass, range ratany, lechuguilla, creosotebush, skeletonleaf goldeneye

Rock outcrop

Landforms: Ridges
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarsely-fractured limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 15 to 30 percent
Depth to first restrictive layer: No restrictive layer

Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

BIG—Bissett-Rock outcrop complex, 20 to 60 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Bissett and similar soils: 65 percent
Rock outcrop and similar soils: 25 percent
Minor components: 10 percent
Culberspeth soils have a petrocalcic horizon and are in lower positions: 3 percent
Unnamed soils occur throughout the unit: 7 percent

Soil Description

Bissett

Landforms: Mountain slopes
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from limestone

Typical Profile

A—0 to 4 inches; moderately alkaline very gravelly loam
Bk—4 to 14 inches; moderately alkaline very cobbly loam
R—14 to 24 inches; limestone bedrock

Properties and Qualities

Slope: 20 to 60 percent
Percent of area covered by surface fragments: About 15 percent subrounded cobbles, about 35 percent subrounded gravel
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 below the 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 2 inches (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

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, slim triden, other forbs, other perennial grasses, other shrubs, Arizona cottontop, threeawn, feather pappusgrass, fluffgrass, range ratany, lechuguilla, creosotebush, skeletonleaf goldeneye

Rock outcrop

Landforms: Mountain slopes
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarsely-fractured limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 25 to 60 percent
Depth to first restrictive layer: No restrictive layer
Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

BRE—Bissett-Rock outcrop complex, moist, 3 to 20 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Hills
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days

Composition Estimates

Major components: 95 percent
Bissett moist and similar soils: 75 percent
Rock outcrop and similar soils: 20 percent
Minor components: 5 percent
Culberspeth moist soils have a petrocalcic horizon and are in lower positions: 3 percent
Kahn moist soils are very deep and are in lower positions: 1 percent
Unnamed soils occur throughout the unit: 1 percent

Soil Description

Bissett soils, moist

Landforms: Ridges
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from limestone

Typical Profile

Ak—0 to 5 inches; moderately alkaline very gravelly loam
Bk—5 to 11 inches; moderately alkaline very gravelly loam
R—11 to 21 inches; limestone bedrock

Properties and Qualities

Slope: 3 to 15 percent
Percent of area covered by surface fragments: About 15 percent subrounded cobbles, about 35 percent subrounded gravel
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 below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill, Dry Mixed Prairie
Ecological site number: R042XD744TX
Typical vegetation: Black grama, blue grama, sideoats grama, curlyleaf muhly, other forbs, other shrubs, hairy grama, New Mexico feathergrass, wolftail, Nealley grama, other perennial grasses, desert zinnia, feather dalea, javelinabush, sotol

Rock outcrop

Landforms: Ridges
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarsely-fractured limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 8 to 20 percent
Depth to first restrictive layer: No restrictive layer
Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

BRG—Bissett-Rock outcrop complex, moist, 20 to 65 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days

Composition Estimates

Major components: 95 percent
Bissett moist and similar soils: 75 percent
Rock outcrop and similar soils: 20 percent
Minor components: 5 percent
Culberspeth moist soils have a petrocalcic horizon and are in lower positions: 4 percent
Unnamed soils occur throughout the unit: 1 percent

Soil Description

Bissett soils, moist

Landforms: Mountain slopes
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from limestone

Typical Profile

A—0 to 6 inches; moderately alkaline very cobbly silt loam
Bk—6 to 14 inches; moderately alkaline very cobbly silt loam
R—14 to 24 inches; limestone bedrock

Properties and Qualities

Slope: 20 to 60 percent
Percent of area covered by surface fragments: About 15 percent subrounded cobbles, about 35 percent subrounded gravel
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 below the 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 2 inches (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill, Dry Mixed Prairie
Ecological site number: R042XD744TX
Typical vegetation: Black grama, blue grama, sideoats grama, curlyleaf muhly, other forbs, other shrubs, hairy grama, New Mexico feathergrass, wolftail, Nealley grama, other perennial grasses, desert zinnia, feather dalea, javelinabush, sotol

Rock outcrop

Landforms: Mountain slopes
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarsely-fractured limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 20 to 65 percent
Depth to first restrictive layer: No restrictive layer
Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

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

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 83 percent
Bissett and similar soils: 40 percent
Rock outcrop and similar soils: 27 percent
Beach and similar soils: 16 percent
Minor components: 17 percent
Culberspeth soils have a petrocalcic horizon and are in lower positions: 6 percent
Unnamed soils occur throughout the unit: 11 percent

Soil Description

Bissett

Landforms: Hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly colluvium derived from limestone over gravelly residuum weathered from limestone

Typical Profile

A—0 to 7 inches; moderately alkaline very gravelly loam
Bk—7 to 17 inches; moderately alkaline very gravelly loam
R—17 to 27 inches; limestone bedrock

Properties and Qualities

Slope: 20 to 70 percent
Percent of area covered by surface fragments: About 25 percent subangular gravel, about 18 percent subangular boulders, about 17 percent subangular stones, about 20 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 below the 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 2 inches (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

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, slim triden, other forbs, other perennial grasses, other shrubs, Arizona cottontop, threeawn, feather pappusgrass, fluffgrass, range ratany, lechuguilla, creosotebush, skeletonleaf goldeneye

Rock outcrop

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarsely-fractured limestone; very dense non-metamorphic sandstone

Typical Profile

R—0 to 10 inches; limestone bedrock, sandstone bedrock

Properties and Qualities

Slope: 20 to 70 percent
Depth to first restrictive layer: No restrictive layer
Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

Beach

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from non-metamorphic sandstone

Typical Profile

A—0 to 9 inches; neutral very gravelly loam
R—9 to 19 inches; sandstone bedrock

Properties and Qualities

Slope: 20 to 70 percent
Percent of area covered by surface fragments: About 20 percent subrounded gravel, about 20 percent subrounded cobbles, about 15 percent subangular channers
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 below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: Not flooded

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, other perennial grasses, sand dropseed, Arizona cottontop, Hall's panicum, other perennial forbs, other shrubs, slim triden, spike dropseed, range ratany, skeletonleaf goldeneye, Ephedra, lechuguilla

BVC—Bofecillos-Leyva complex, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 85 percent
Bofecillos and similar soils: 60 percent
Leyva and similar soils: 25 percent
Minor components: 15 percent
Chispa soils have a calcic horizon and are in lower positions: 4 percent
Horsetrap soils have a cambic horizon and are in lower positions: 1 percent
Unnamed soils occur throughout the unit: 10 percent

Soil Description

Bofecillos

Landforms: Low hills
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Residuum weathered from basalt and/or colluvium derived from basalt

Typical Profile

A—0 to 9 inches; slightly alkaline very gravelly loam
R—9 to 19 inches; basalt bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 50 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: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability below the 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: High
Flooding frequency: Not flooded

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, slim triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Leyva

Landforms: Low hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from igneous rock and/or colluvium derived from igneous rock

Typical Profile

A—0 to 6 inches; neutral very gravelly clay loam
Bt—6 to 12 inches; neutral very gravelly clay
R—12 to 22 inches; igneous bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 50 percent subrounded gravel, about 15 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: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Igneous Hill and Mountain, Desert Grassland (fig. 4)

Figure 4.—Bofecillos soils in an area of Bofecillos-Leyva complex, 1 to 8 percent slopes. This map unit is in the Igneous Hill and Mountain ecological site, Desert Grassland vegetative zone.

Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, slim triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

BVE—Bofecillos-Leyva-Horsetrap complex, 10 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 87 percent
Bofecillos and similar soils: 37 percent
Leyva and similar soils: 33 percent
Horsetrap and similar soils: 17 percent
Minor components: 13 percent
Double soils have less fragments and are in lower positions: 3 percent
McAllister soils have less fragments and are in lower positions: 3 percent
Unnamed soils occur throughout the unit: 7 percent

Soil Description

Bofecillos

Landforms: Hills
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Colluvium derived from basalt over residuum weathered 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: 10 to 30 percent
Percent of area covered by surface fragments: About 65 percent subangular gravel, about 5 percent subangular cobbles, about 2 percent subangular stones
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 below the 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: Not flooded

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, slim triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Leyva

Landforms: Hills
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from igneous rock and/or colluvium derived from igneous rock

Typical Profile

A—0 to 10 inches; neutral very cobbly clay loam
Bt—10 to 15 inches; neutral very gravelly clay
R—15 to 25 inches; igneous bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 50 percent subrounded gravel, about 15 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: 0.2 to 0.6 in/hr (moderately slow)
Slowest permeability below the 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 2 inches (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: Not flooded

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, slim triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Horsetrap

Landforms: Hills
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Gravelly residuum weathered from basalt and/or gravelly colluvium derived from basalt

Typical Profile

A—0 to 8 inches; moderately alkaline very cobbly sandy clay loam
Bk—8 to 14 inches; moderately alkaline very cobbly sandy clay loam
R—14 to 24 inches; basalt bedrock

Properties and Qualities

Slope: 10 to 30 percent
Percent of area covered by surface fragments: About 50 percent subangular gravel, about 25 percent subrounded cobbles, about 10 percent subrounded stones
Depth to first restrictive layer: 12 to 19 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 below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, slim triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

CCE—Changas-Corazones complex, 1 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 3,000 to 4,000 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: 58 percent
Changas and similar soils: 41 percent
Corazones and similar soils: 17 percent
Minor components: 42 percent
Pantera soils have more sand and are in drainageways: 8 percent
Ojinaga soils have a petrocalcic horizon and are in slightly higher positions: 5 percent
Unnamed soils occur throughout the unit: 29 percent

Soil Description

Changas

Landforms: Erosional fan remnants
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Gypsiferous clayey lacustrine deposits

Typical Profile

A—0 to 4 inches; slightly alkaline sandy clay loam
By—4 to 80 inches; slightly alkaline clay

Properties and Qualities

Slope: 5 to 30 percent
Percent of area covered by surface fragments: About 80 percent subangular 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: 0.001 to 0.06 in/hr (very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 9 inches (high)

Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

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, Hall's panicum, western honey mesquite, whorled dropseed, creosotebush, other perennial grasses, tubercled saltbush, wolfberry, fluffgrass, mound saltbush

Corazones

Landforms: Fan remnants
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from mixed sources

Typical Profile

A—0 to 4 inches; moderately alkaline very gravelly loam
Bk1—4 to 12 inches; moderately alkaline very gravelly loam
Bk2—12 to 80 inches; moderately alkaline extremely gravelly loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 15 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 inches (low)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: Not flooded

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, slim triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg coldenia

CHC—Chilicotal very gravelly loam, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Piedmont slopes
Elevation: 4,000 to 5,500 feet

Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 83 percent
Chilicotal and similar soils: 83 percent
Minor components: 17 percent
Culberspeth soils have a petrocalcic horizon and are in slightly higher positions: 6 percent
Chispa soils have less fragments and are in similar positions: 5 percent
Bissett soils are shallow to bedrock and are in higher positions: 1 percent
Unnamed soils occur throughout the unit: 5 percent

Soil Description

Chilicotal

Landforms: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly pedisediment derived from limestone

Typical Profile

A—0 to 6 inches; moderately alkaline very gravelly loam
Bk—6 to 80 inches; moderately alkaline very gravelly loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 3 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: 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 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: Black grama, sideoats grama, other perennial grasses, bush muhly, creosotebush, Arizona cottontop, slim triden, threeawn, other shrubs, other forbs, other annual forbs, range ratany, mariola

CIB—Chillon extremely gravelly sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins

Elevation: 3,000 to 4,000 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: 85 percent
Chillon and similar soils: 85 percent
Minor components: 15 percent
Corazones soils have a calcic horizon and are in slightly higher positions: 10 percent
Pantera soils have more sand and are in drainageways: 3 percent
Unnamed soils occur throughout the unit: 2 percent

Soil Description

Chillon

Landforms: Stream terraces (fig. 5)
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 7 inches; slightly alkaline extremely gravelly sandy loam
Bk—7 to 20 inches; moderately alkaline extremely gravelly coarse sandy loam
BC—20 to 36 inches; moderately alkaline extremely gravelly loamy coarse sand
C—36 to 80 inches; moderately alkaline extremely cobbly coarse sandy loam

Figure 5.—An area of Chillon extremely gravelly sandy loam, 1 to 3 percent slopes. Chillon soils are on stream terraces. Vegetation at this site consists of creosotebush and ocotillo.

Properties and Qualities

Slope: 1 to 3 percent
Percent of area covered by surface fragments: About 33 percent subangular gravel, about 24 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 inches (very low)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: Not flooded

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, slim triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg coldenia

CLA—Chipotle-Riverwash complex, 0 to 2 percent slopes, frequently flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Piedmont slopes
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 85 percent
Chipotle and similar soils: 63 percent
Riverwash and similar soils: 22 percent
Minor components: 15 percent
Unnamed soils occur throughout the unit: 15 percent

Soil Description

Chipotle

Landforms: Arroyos
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Gravelly alluvium

Typical Profile

A—0 to 7 inches; slightly acid extremely gravelly loamy sand
C1—7 to 16 inches; slightly acid extremely gravelly sand

C2—16 to 60 inches; neutral extremely gravelly loamy sand
C3—60 to 80 inches; neutral extremely gravelly loamy sand

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 60 percent gravel, about 10 percent 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 3 inches (very low)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: Frequently flooded

Interpretive Groups

Land capability nonirrigated: 7s
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: Arroyos
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Holocene age sandy and gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

C—0 to 80 inches; gravel

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: Not specified
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: Negligible
Flooding frequency: Frequently flooded

Interpretive Groups

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

COC—Chispa-Chilicotal complex, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Piedmont slopes
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Chispa and similar soils: 55 percent
Chilicotal and similar soils: 35 percent
Minor components: 10 percent
McAllister soils have more clay and are in lower positions: 4 percent
Culberspeth soils have a petrocalcic horizon and are in slightly higher positions: 2 percent
Unnamed soils occur throughout the unit: 4 percent

Soil Description

Chispa

Landforms: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from mixed sources

Typical Profile

A—0 to 4 inches; moderately alkaline gravelly sandy clay loam
Bk—4 to 80 inches; moderately alkaline gravelly sandy clay loam

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 5 percent subangular gravels
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 6 inches (moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

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

Chilicotal

Landforms: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Fan gravelly alluvium derived from igneous rock

Typical Profile

A—0 to 6 inches; moderately alkaline very gravelly sandy loam
Bk—6 to 31 inches; moderately alkaline extremely gravelly sandy loam
BCk—31 to 80 inches; strongly alkaline very gravelly sandy loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 3 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: 0.6 to 2.0 in/hr (moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 6 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

Interpretive Groups

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

CPC—Chispa-Tenneco complex, 0 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Piedmont slopes
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Chispa and similar soils: 55 percent
Tenneco and similar soils: 35 percent
Minor components: 10 percent
Chilicotal soils have more fragments and are in similar positions as the Chispa soils: 4 percent
Culberspeth soils have a petrocalcic horizon and are in slightly higher positions: 2 percent
Unnamed soils occur throughout the unit: 4 percent

Soil Description

Chispa

Landforms: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from mixed sources

Typical Profile

A—0 to 6 inches; moderately alkaline sandy loam
Bw—6 to 16 inches; moderately alkaline sandy clay loam
Bk—16 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 0 to 5 percent
Percent of area covered by surface fragments: About 5 percent subangular gravels
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 11 inches (high)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

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

Tenneco

Landforms: Alluvial fans
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy alluvium derived from mixed sources

Typical Profile

A—0 to 6 inches; moderately alkaline loam
Bw—6 to 31 inches; moderately alkaline sandy clay loam and loam
Bk—31 to 80 inches; moderately alkaline clay loam and 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: 0.6 to 2.0 in/hr (moderate)
Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.8 inches (high)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, tarbush

CTC—Corvus-Peligro-Yesum complex, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 3,000 to 4,000 feet
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Composition Estimates

Major components: 85 percent
Corvus and similar soils: 35 percent
Yesum and similar soils: 25 percent
Peligro and similar soils: 25 percent
Minor components: 15 percent
Unnamed soils occur throughout the unit: 15 percent

Soil Description

Corvus

Landforms: Relict stabilized gypsum dunes
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gypsiferous eolian deposits

Typical Profile

Ayy—0 to 2 inches; slightly alkaline gypsiferous loam
Byy1—2 to 6 inches; slightly alkaline gypsiferous loam
Byym—6 to 9 inches; gypsiferous cemented material
Byy2—9 to 80 inches; slightly alkaline gypsiferous loam

Properties and Qualities

Slope: 1 to 5 percent
Depth to first restrictive layer: 6 to 12 inches to petrogypsic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)

Slowest permeability below the 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: Saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 0.8 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7c
Ecological site name: Gyp Outcrop, Desert Shrub
Ecological site number: R042XB007NM
Typical vegetation: Gyp grama, hairy coldenia, gyp dropseed, other forbs, other shrubs, fourwing saltbush, other perennial grasses, Torrey epherda, gypsum moonpod

Yesum

Landforms: Relict stabilized gypsum dunes
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Gypsiferous loamy alluvium and/or gypsiferous eolian deposits

Typical Profile

Ay—0 to 2 inches; moderately alkaline fine sandy loam
Bky—2 to 7 inches; moderately alkaline coarse sandy loam
Bkyy—7 to 80 inches; slightly alkaline gypsiferous coarse sandy loam and gypsiferous loam

Properties and Qualities

Slope: 1 to 8 percent
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 11 inches (high)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7c
Ecological site name: Gyp Upland, Desert Shrub
Ecological site number: R042XB006NM
Typical vegetation: Black grama, alkali sacaton, fourwing saltbush, other forbs, gyp grama, other perennial grasses, gyp dropseed, plains bristlegrass, allthorn, hairy coldenia, other shrubs

Peligro

Landforms: Relict stabilized gypsum dunes
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Gypsiferous sandy eolian deposits

Typical Profile

Ay—0 to 1 inches; moderately alkaline fine sandy loam
Byy—1 to 80 inches; moderately alkaline gypsiferous coarse sand

Properties and Qualities

Slope: 1 to 8 percent
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 3 inches (low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7c
Ecological site name: Gyp Outcrop, Desert Shrub
Ecological site number: R042XB007NM
Typical vegetation: Gyp grama, hairy coldenia, gyp dropseed, other forbs, other shrubs, fourwing saltbush, other perennial grasses, Torrey epherda, gypsum moonpod

CVC—Culberspeth-Chilicotal complex, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Piedmont slopes
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 95 percent
Culberspeth and similar soils: 65 percent
Chilicotal and similar soils: 30 percent
Minor components: 5 percent
Chispa soils have less fragments and are in similar positions as the Chilicotal soils: 2 percent

Kinco soils have less fragments and are in similar positions as the Chilicotal soils: 1 percent
Double soils do not have a calcic horizon and are in similar positions as the Chilicotal soils: 1 percent
Reyab soils have more silt and are in lower positions: 1 percent

Soil Description

Culberspeth

Landforms: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from mixed sources and/or gravelly colluvium derived from mixed sources

Typical Profile

A—0 to 2 inches; strongly alkaline gravelly loam
Bk—2 to 8 inches; strongly alkaline gravelly loam
Bkkm—8 to 18 inches; cemented material

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 20 percent subrounded gravel
Depth to first restrictive layer: 6 to 20 inches to petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

Interpretive Groups

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

Chilicotal

Landforms: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly pedisediment derived from limestone

Typical Profile

A—0 to 3 inches; moderately alkaline loam
Bw—3 to 12 inches; moderately alkaline gravelly loam

Bk1—12 to 22 inches; moderately alkaline gravelly clay loam
Bk2—22 to 80 inches; moderately alkaline extremely gravelly loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 40 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 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

Interpretive Groups

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

CWC—Culberspeth-Kahn complex, moist, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Piedmont slopes
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days

Composition Estimates

Major components: 95 percent
Culberspeth moist and similar soils: 60 percent
Kahn moist and similar soils: 35 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Soil Description

Culberspeth soils, moist

Landforms: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from mixed sources and/or gravelly colluvium derived from mixed sources

Typical Profile

A—0 to 7 inches; strongly alkaline gravelly loam
Bk—7 to 19 inches; strongly alkaline loam
Bkkm—19 to 29 inches; cemented material

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 15 percent subrounded gravel
Depth to first restrictive layer: 6 to 20 inches to petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability below the 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 3 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gravelly, Dry Mixed Prairie
Ecological site number: R042XD007NM
Typical vegetation: Black grama, blue grama, sand dropseed, other perennial grasses, Hall's panicum, green spangletop, sideoats grama, plains bristlegrass, sand muhly, other forbs, other shrubs, winterfat, croton

Kahn soils, moist

Landforms: Fan remnants
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous alluvium derived from limestone

Typical Profile

A—0 to 8 inches; slightly alkaline very fine sandy loam
Bk1—8 to 24 inches; moderately alkaline loam
Bk2—24 to 80 inches; moderately alkaline sandy clay loam

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 10 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 inches (high)

Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Loamy, Dry Mixed Prairie
Ecological site number: R042XD001NM
Typical vegetation: Blue grama, tobosa, cane bluestem, sideoats grama, other perennial grasses, alkali sacaton, Arizona cottontop, vine mesquite, forbs, burrograss, ear muhly, other shrubs

DEB—Dellahunt silt loam, 0 to 5 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Karst
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 80 percent
Dellahunt and similar soils: 80 percent
Minor components: 20 percent
Joberanch soils have a petrogypsic horizon and are in slightly higher positions: 10 percent
Unnamed soils occur throughout the unit: 10 percent

Soil Description

Dellahunt

Landforms: Alluvial flats (fig. 6)
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Loamy alluvium derived from rock gypsum and/or loamy alluvium derived from sandstone

Typical Profile

A—0 to 6 inches; moderately alkaline silt loam
Bw—6 to 30 inches; moderately alkaline silty clay loam
Bky—30 to 80 inches; moderately alkaline silt loam

Properties and Qualities

Slope: 0 to 5 percent
Percent of area covered by surface fragments: About 1 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: Not sodic

Figure 6.—An area of Dellahunt silt loam, 0 to 5 percent slopes, occasionally flooded. Dellahunt soils are on alluvial flats. Vegetation consists of burrograss, tobosa, creosotebush, and tarbush.

Representative total available water capacity to 60 inches: About 11 inches (high)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Occasionally flooded

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, creosotebush, tarbush, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, fourwing saltbush

DNB—Dellahunt-Neimahr-Joberanch complex, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Karst
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 80 percent
Dellahunt and similar soils: 30 percent
Joberanch and similar soils: 25 percent
Neimahr and similar soils: 25 percent
Minor components: 20 percent
Elcor soils are shallow to bedrock and do not have a silicate cap and are in higher positions: 3 percent
Pokorny soils have a petrogypsic horizon and do not have a silicate cap and are in similar positions as the Joberanch soils: 3 percent
Unnamed soils occur throughout the unit: 14 percent

Soil Description

Dellahunt

Landforms: Alluvial flats
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Loamy alluvium derived from rock gypsum and/or loamy alluvium derived from sandstone

Typical Profile

A—0 to 4 inches; moderately alkaline loam
Bw—4 to 17 inches; moderately alkaline clay loam
Bky—17 to 80 inches; moderately alkaline loam, silt loam, and very fine sandy loam

Properties and Qualities

Slope: 1 to 3 percent
Percent of area covered by surface fragments: About 1 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: Not sodic
Representative total available water capacity to 60 inches: About 11 inches (high)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, fourwing saltbush

Neimahr

Landforms: Alluvial flats
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Alluvium derived from sandstone and/or alluvium derived from rock gypsum

Typical Profile

A—0 to 5 inches; neutral very fine sandy loam
Bk—5 to 17 inches; slightly alkaline clay loam
R—17 to 27 inches; gypsum bedrock

Properties and Qualities

Slope: 1 to 3 percent
Percent of area covered by surface fragments: About 20 percent subangular gravel
Depth to first restrictive layer: 8 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 below the 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 2 inches (very low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, fourwing saltbush

Joberanch

Landforms: Alluvial flats
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Alluvium derived from sandstone and/or alluvium derived from rock gypsum

Typical Profile

A1—0 to 3 inches; moderately alkaline loam
A2—3 to 8 inches; moderately alkaline clay loam
Bky—8 to 12 inches; moderately alkaline loam
2Byym—12 to 80 inches; gypsiferous cemented material

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: 10 to 18 inches to petrogypsic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability below the 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 inches (very low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, fourwing saltbush

DOC—Double loam, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Piedmont slopes
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Double and similar soils: 90 percent
Minor components: 10 percent
Chispa soils have a calcic horizon and are in similar positions: 10 percent

Soil Description

Double

Landforms: Alluvial fans
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Calcareous alluvium derived from limestone

Typical Profile

A—0 to 4 inches; moderately alkaline loam
Bw—4 to 23 inches; moderately alkaline loam
Bk—23 to 80 inches; moderately alkaline clay 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: 0.6 to 2.0 in/hr (moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 11 inches (high)
Natural drainage class: Well drained

Runoff: Medium
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, tarbush

ELC—Elcor gypsiferous loam, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Karst
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 95 percent
Elcor and similar soils: 95 percent
Minor components: 5 percent
Hollebeke soils have a petrogypsic horizon and are in similar positions: 2 percent
Rock outcrop: 2 percent
Unnamed soils occur throughout the unit: 1 percent

Soil Description

Elcor

Landforms: Hills
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Residuum weathered from rock gypsum

Typical Profile

Byy—0 to 7 inches; slightly alkaline gypsiferous loam
R—7 to 17 inches; rock gypsum bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 1 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 0.2 inch (very low)

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

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gyp Hill, Desert Grassland (fig. 7)
Ecological site number: R042XC752TX
Typical vegetation: Gyp grama, hairy coldenia, gyp dropseed, other forbs, feather pappusgrass, other perennial grasses, rosemary mint, Torrey's ephedra, gyp nama, gypsum moonpod, other shrubs

ELE—Elcor gypsiferous loam, 5 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Karst
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Figure 7.—An area of Elcor gypsiferous loam, 1 to 8 percent slopes. Vegetation includes rough coldenia, creosotebush, soaptree yucca, and littleleaf sumac. The Elcor soils are in the Gyp Hill ecological site, Desert Grassland vegetative zone.

Composition Estimates

Major components: 80 percent
Elcor and similar soils: 80 percent
Minor components: 20 percent
Hollebeke soils have a petrogypsic horizon and are in similar positions: 12 percent
Pokorny soils have a petrogypsic horizon and are in lower positions: 5 percent
Rock outcrop: 3 percent

Soil Description

Elcor

Landforms: Hills
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Residuum weathered from rock gypsum

Typical Profile

Ayy—0 to 3 inches; moderately alkaline gypsiferous loam
Byy—3 to 7 inches; moderately alkaline gypsiferous loam
R—7 to 17 inches; rock gypsum bedrock

Properties and Qualities

Slope: 5 to 30 percent
Percent of area covered by surface fragments: About 1 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 1 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gyp Hill, Desert Grassland
Ecological site number: R042XC752TX
Typical vegetation: Gyp grama, hairy coldenia, gyp dropseed, other forbs, feather pappusgrass, other perennial grasses, rosemary mint, Torrey's ephedra, gyp nama, gypsum moonpod, other shrubs

EPA—Elcor-Dellahunt-Pokorny complex, 0 to 2 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Karst
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches

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

Composition Estimates

Major components: 90 percent
Elcor and similar soils: 35 percent
Dellahunt and similar soils: 30 percent
Pokorny and similar soils: 25 percent
Minor components: 10 percent
Joberanch soils have a petrogypsic horizon and a silicate cap and are in similar positions as the Pokorny soils: 5 percent
Neimahr soils are shallow to bedrock and have a silicate cap and are in similar positions as the Elcor soils: 4 percent
Unnamed soils occur throughout the unit: 1 percent

Soil Description

Elcor

Landforms: Hills
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Residuum weathered from rock gypsum

Typical Profile

Byy—0 to 19 inches; slightly alkaline gypsiferous loam
R—19 to 80 inches; gypsum bedrock

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 1 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 below the 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 2 inches (very low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gyp Hill, Desert Grassland
Ecological site number: R042XC752TX
Typical vegetation: Gyp grama, hairy coldenia, gyp dropseed, other forbs, feather pappusgrass, other perennial grasses, gyp nama, rosemary mint, gypsum moonpod, other shrubs, Torrey's ephedra

Dellahunt

Landforms: Alluvial flats
Down-slope shape: Linear, concave

Across-slope shape: Linear, concave
Parent material: Loamy alluvium derived from rock gypsum and/or loamy alluvium derived from sandstone

Typical Profile

A—0 to 9 inches; moderately alkaline silt loam
Bw—9 to 34 inches; moderately alkaline silt loam
Bky—34 to 80 inches; moderately alkaline silt loam

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 1 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: Not sodic
Representative total available water capacity to 60 inches: About 11 inches (high)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, fourwing saltbush

Pokorny

Landforms: Terraces, alluvial flats
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Gypsiferous alluvium

Typical Profile

A—0 to 1 inches; slightly alkaline loam
Byy—1 to 17 inches; slightly alkaline gypsiferous silt loam and gypsiferous silty clay loam
Byym—17 to 80 inches; moderately alkaline gypsiferous cemented material

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 1 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to petrogypsic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability below the 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 3 inches (very low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Gyp Alluvium, Desert Grassland
Ecological site number: R042XC748TX
Typical vegetation: Gyp grama, gyp dropseed, hairy coldenia, other forbs, alkali sacaton, fourwing saltbush, littleleaf sumac, other perennial grasses, other shrubs, oneseed juniper, agarito, soaptree yucca, gypsum moonpod

EPE—Elcor-Pokorny-Hollomex-Walkerwells complex, 0 to 30 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Karst
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Elcor and similar soils: 30 percent
Pokorny and similar soils: 30 percent
Hollomex and similar soils: 15 percent
Walkerwells and similar soils: 15 percent
Minor components: 10 percent
Hollebeke soils have a petrogypsic horizon and are shallow to bedrock and are in similar positions as the Elcor soils: 8 percent
Joberanch soils have a petrogypsic horizon and a silicate cap and are in similar positions as the Pokorny soils: 2 percent

Soil Description

Elcor

Landforms: Hills
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Residuum weathered from rock gypsum

Typical Profile

Byy—0 to 7 inches; moderately alkaline gypsiferous silt loam
R—7 to 17 inches; rock gypsum bedrock

Properties and Qualities

Slope: 1 to 30 percent
Percent of area covered by surface fragments: About 1 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 0.7 inch (very low)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gyp Hill, Desert Grassland (fig. 8)
Ecological site number: R042XC752TX
Typical vegetation: Gyp grama, hairy coldenia, gyp dropseed, other forbs, feather pappusgrass, other perennial grasses, rosemary mint, Torrey's ephedra, gyp nama, gypsum moonpod, other shrubs

Pokorny

Landforms: Terraces
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Gypsiferous alluvium

Typical Profile

Byy—0 to 14 inches; slightly alkaline gypsiferous silty clay loam
Byym—14 to 59 inches; cemented material

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 1 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to petrogypsic
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 inches (very low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Gyp Alluvium, Desert Grassland (fig. 8)
Ecological site number: R042XC748TX
Typical vegetation: Gyp grama, gyp dropseed, hairy coldenia, other forbs, alkali sacaton, fourwing saltbush, littleleaf sumac, other perennial grasses, other shrubs, oneseed juniper, agarito, soaptree yucca, gypsum moonpod

Figure 8.—Elcor and Pokorny soils in an area of Elcor-Pokorny-Hollomex-Walkerwells complex, 0 to 30 percent slopes. Vegetation consists of rough coldenia, soaptree yucca, and oneseed juniper. Elcor soils are in the Gyp Hill ecological site, Desert Grassland vegetative zone; and Pokorny soils are in the Gyp Alluvium ecological site, Desert Grassland vegetative zone.

Hollomex

Landforms: Terraces
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Calcareous and gypsiferous loamy alluvium derived from rock gypsum

Typical Profile

A—0 to 2 inches; moderately alkaline loam
Cyy—2 to 80 inches; moderately alkaline gypsiferous loam and gypsiferous fine sandy loam

Properties and Qualities

Slope: 1 to 10 percent
Percent of area covered by surface fragments: About 1 percent subangular 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 inches (low)
Natural drainage class: Well drained

Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Gyp Hill, Desert Grassland
Ecological site number: R042XC752TX
Typical vegetation: Gyp grama, hairy coldenia, gyp dropseed, other forbs, feather pappusgrass, other perennial grasses, rosemary mint, Torrey's ephedra, gyp nama, gypsum moonpod, other shrubs

Walkerwells

Landforms: Flood plains, drainageways
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Loamy alluvium derived from rock gypsum and/or loamy alluvium derived from sandstone

Typical Profile

A—0 to 6 inches; moderately alkaline very fine sandy loam
Bw—6 to 42 inches; moderately alkaline silty clay loam
By—42 to 80 inches; strongly alkaline silty clay loam

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 1 percent fine 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 12 inches (high)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Bottomland, Desert Grassland
Ecological site number: R042XC017NM
Typical vegetation: Giant sacaton, alkali sacaton, other forbs, vine mesquite, cane bluestem, plains bristlegrass, false Rhodes grass, other perennial grasses, fourwing saltbush, other shrubs, tarbush

GAA—Gypsic Aquisalids, 0 to 2 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 3,000 to 4,000 feet

Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Composition Estimates

Major components: 95 percent
Gypsic Aquisalids and similar soils: 95 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Soil Description

Gypsic Aquisalids

Landforms: Basin floors
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Gypsiferous loamy lacustrine deposits

Typical Profile

Az—0 to 5 inches; moderately alkaline silt loam
Byz1—5 to 15 inches; moderately alkaline silt loam
Byz2—15 to 80 inches; moderately alkaline silty 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: 0.2 to 0.6 in/hr (moderately 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 12 inches (very high)
Natural drainage class: Poorly drained
Runoff: Negligible
Flooding frequency: Occasionally flooded

Interpretive Groups

Land capability nonirrigated: 8s
Ecological site name: Gyp Playa, Desert Shrub
Ecological site number: R042XB008NM
Typical vegetation: Alkali sacaton, inland saltgrass, iodinebush, other annual forbs

HPC—Hollebeke-Pokorny complex, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Karst
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 80 percent
Hollebeke and similar soils: 45 percent
Pokorny and similar soils: 35 percent
Minor components: 20 percent
Dellahunt soils do not have a petrogypsic horizon and are in lower positions: 5 percent
Joberanch soils have a silicate cap and are in lower positions: 4 percent
Neimahr soils are shallow to bedrock and are in higher positions: 2 percent
Unnamed soils occur throughout the unit: 9 percent

Soil Description

Hollebeke

Landforms: Low hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from rock gypsum

Typical Profile

A—0 to 1 inch; slightly alkaline loam
Byy—1 to 4 inches; slightly alkaline gypsiferous silt loam
Byym—4 to 13 inches; gypsiferous cemented material
R—13 to 22 inches; rock gypsum bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 20 percent subangular gravel
Depth to first restrictive layer: 2 to 10 inches to petrogypsic; 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: 0.2 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 0.4 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Gyp Hill, Desert Grassland
Ecological site number: R042XC752TX
Typical vegetation: Gyp grama, hairy coldenia, gyp dropseed, other forbs, feather pappusgrass, other perennial grasses, rosemary mint, Torrey's ephedra, gyp nama, gypsum moonpod, other shrubs

Pokorny

Landforms: Alluvial flats
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Gypsiferous alluvium

Typical Profile

Byy1—0 to 2 inches; slightly alkaline gypsiferous loam
Byy2—2 to 19 inches; slightly alkaline gypsiferous clay loam
Byym—19 to 29 inches; cemented material

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 1 percent subangular gravel
Depth to first restrictive layer: 4 to 20 inches to petrogypsic
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 3 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Gyp Alluvium, Desert Grassland
Ecological site number: R042XC748TX
Typical vegetation: Gyp grama, gyp dropseed, hairy coldenia, other forbs, alkali sacaton, fourwing saltbush, littleleaf sumac, other perennial grasses, other shrubs, oneseed juniper, agarito, soaptree yucca, gypsum moonpod

HRC—Horsetrap-Bofecillos complex, 1 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 78 percent
Horsetrap and similar soils: 39 percent
Bofecillos and similar soils: 39 percent
Minor components: 22 percent
Chilicotal soils are very deep and are in lower positions: 3 percent
Unnamed soils occur throughout the unit: 19 percent

Soil Descriptions

Horsetrap

Landforms: Low hills
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear

Parent material: Gravelly residuum weathered from basalt and/or gravelly colluvium derived from basalt

Typical Profile

A—0 to 9 inches; moderately alkaline gravelly sandy loam
Bk—9 to 17 inches; moderately alkaline very gravelly sandy loam
R—17 to 27 inches; basalt bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 50 percent subrounded gravel
Depth to first restrictive layer: 12 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 inch (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Igneous Hill and Mountain, Desert Grassland
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, slim triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Bofecillos

Landforms: Low hills
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Skeletal residuum weathered from basalt and/or skeletal colluvium derived from basalt

Typical Profile

A—0 to 9 inches; slightly alkaline very gravelly sandy loam
R—9 to 19 inches; basalt bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 50 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: 0.2 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 0.8 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, slim triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

KPB—Kinco-Aguena-Perilla complex, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 87 percent
Kinco and similar soils: 43 percent
Aguena and similar soils: 27 percent
Perilla and similar soils: 17 percent
Minor components: 13 percent
McAllister soils contain more clay and are in lower positions: 3 percent
Chispa soils contain more clay and are in similar positions as the Kinco soils: 2 percent
Unnamed soils occur throughout the unit: 8 percent

Soil Description

Kinco

Landforms: Interdunes on alluvial flats
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 8 inches; moderately alkaline loamy coarse sand
Bw—8 to 31 inches; moderately alkaline fine sandy loam
Bk—31 to 80 inches; moderately alkaline loamy coarse sand, loamy very fine sand, and fine sandy loam

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: 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 inches (moderate)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: Not flooded

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, other forbs, sand dropseed, spike dropseed, other shrubs, Arizona cottontop, bush muhly, plains bristlegrass, mesa dropseed, fourwing saltbush, creosotebush

Aguena

Landforms: Dunes (fig. 9)
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Eolian sands derived from mixed sources

Figure 9.—Aguena soils in an area of Kinco-Aguena-Perilla complex, 1 to 5 percent slopes. Aguena soils formed from eolian sands, which forms a dune-like appearance. Vegetation consists of sand dropseed, broom dalea, sandsage, western honey mesquite, javelinabush, and soaptree yucca.

Typical Profile

A—0 to 4 inches; slightly alkaline loamy fine sand
C—4 to 80 inches; moderately alkaline loamy fine sand

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 1 percent 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 5 inches (low)
Natural drainage class: Excessively drained
Runoff: Very low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Sand Hills, Desert Grassland
Ecological site number: R042XC756TX
Typical vegetation: Giant dropseed, sand dropseed, spike dropseed, mesa dropseed, black grama, other perennial grasses, other shrubs, plains bristlegrass, sideoats grama, western honey mesquite, fourwing saltbush, other forbs, sand sagebrush, croton, javelinabush, soaptree yucca

Perilla

Landforms: Interdunes on alluvial flats
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 16 inches; slightly alkaline fine sandy loam
Bw—16 to 37 inches; slightly alkaline fine sandy loam and loamy sand
Bk—37 to 80 inches; moderately alkaline coarse sandy loam, loamy fine sand, and fine sandy loam

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: 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 8 inches (moderate)
Natural drainage class: Somewhat excessively drained
Runoff: Very low
Flooding frequency: Not flooded

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, other forbs, sand dropseed, spike dropseed, other shrubs, Arizona cottontop, bush muhly, plains bristlegrass, mesa dropseed, fourwing saltbush, creosotebush

LPG—Lampshire-Pantak complex, 10 to 60 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 85 percent
Lampshire and similar soils: 50 percent
Pantak and similar soils: 35 percent
Minor components: 15 percent
Horsetrap soils have a cambic horizon and are in lower positions: 7 percent
Rock outcrop: 5 percent
Unnamed soils occur throughout the unit: 3 percent

Soil Description

Lampshire

Landforms: Hills
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Gravelly residuum weathered from basalt and/or gravelly colluvium derived from basalt

Typical Profile

A—0 to 4 inches; slightly alkaline extremely cobbly coarse sandy loam
R—4 to 14 inches; basalt bedrock

Properties and Qualities

Slope: 10 to 60 percent
Percent of area covered by surface fragments: About 30 percent subrounded gravel, about 5 percent subrounded 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 below the 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: Not flooded

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, slim triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

Pantak

Landforms: Hills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Residuum weathered from igneous rock and/or colluvium derived from igneous rock

Typical Profile

A—0 to 5 inches; neutral very gravelly sandy clay loam
Bt—5 to 10 inches; slightly alkaline extremely gravelly clay loam
R—10 to 20 inches; igneous bedrock

Properties and Qualities

Slope: 10 to 60 percent
Percent of area covered by surface fragments: About 5 percent subrounded cobbles, about 35 percent subrounded 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 below the 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: Not flooded

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, slim triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

LRE—Lark gypsiferous sand, 5 to 20 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 3,000 to 4,000 feet
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Composition Estimates

Major components: 95 percent
Lark and similar soils: 95 percent
Minor components: 5 percent
Monahans soils have more clay and are in lower positions: 3 percent
Unnamed soils occur throughout the unit: 2 percent

Soil Description

Lark

Landforms: Lunette playa dunes
Down-slope shape: Concave, convex
Across-slope shape: Linear, convex, concave
Parent material: Gypsiferous eolian sands

Typical Profile

Cyy1—0 to 18 inches; neutral gypsiferous sand
Cyy2—18 to 80 inches; neutral gypsiferous sand

Properties and Qualities

Slope: 5 to 20 percent
Depth to first restrictive layer: No restrictive layer
Slowest soil permeability to 60 inches, above first cemented restrictive layer: Greater than 20 in/hr (very rapid)
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 2 inches (very low)
Natural drainage class: Somewhat excessively drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7c
Ecological site name: Vegetated Gyp Dunes, Desert Shrub
Ecological site number: R042XB003NM
Typical vegetation: Gyp grama, rosemary mint, soaptree yucca, fourwing saltbush, other forbs, Indian ricegrass, Torrey's ephedra, hairy coldenia, other shrubs, other perennial grasses

MAB—McAllister fine sandy loam, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 85 percent
McAllister and similar soils: 85 percent
Minor components: 15 percent
Chispa soils do not have an argillic horizon and are in similar positions: 3 percent
Unnamed soils occur throughout the unit: 12 percent

Soil Description

McAllister

Landforms: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from mixed sources

Typical Profile

Ap—0 to 8 inches; slightly alkaline fine sandy loam
Bt—8 to 20 inches; slightly alkaline sandy clay loam
Btk—20 to 63 inches; moderately alkaline sandy clay loam
Bk—63 to 80 inches; moderately alkaline 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: 0.6 to 2.0 in/hr (moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9 inches (moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 6c
Land capability irrigated: 2e
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, tarbush

MCB—Michigan clay, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Michigan and similar soils: 90 percent
Minor components: 10 percent
Double soils have less clay and are in slightly higher positions: 2 percent
Chispa soils have less clay and are in slightly higher positions: 2 percent
Stovall soils have less clay and are in slightly higher positions: 2 percent
Unnamed soils occur throughout the unit: 4 percent

Soil Description

Michigan

Landforms: Alluvial flats (fig. 10)
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium derived from igneous and sedimentary rock

Typical Profile

Ap—0 to 7 inches; moderately alkaline clay
Bw—7 to 21 inches; moderately alkaline clay
Bk—21 to 80 inches; moderately alkaline clay

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

Interpretive Groups

Land capability nonirrigated: 6c
Land capability irrigated: 2e
Ecological site name: Loamy, Desert Grassland
Ecological site number: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, tarbush

Figure 10.—A harvested field of cotton on an area of Michigan clay, 0 to 3 percent slopes. Michigan soils are on alluvial flats.

MHA—Monahans fine sandy loam, 0 to 2 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 3,000 to 4,000 feet
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Composition Estimates

Major components: 85 percent
Monahans and similar soils: 85 percent
Minor components: 15 percent
Unnamed soils occur throughout the unit: 15 percent

Soil Description

Monahans

Landforms: Fan skirts on fan piedmonts
Down-slope shape: Concave, linear
Across-slope shape: Linear, convex
Parent material: Calcareous and gypsiferous loamy alluvium

Typical Profile

A—0 to 2 inches; moderately alkaline fine sand
Bw—2 to 6 inches; moderately alkaline fine sandy loam
Bk—6 to 16 inches; moderately alkaline fine sandy loam
By—16 to 80 inches; moderately alkaline fine sandy 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: 0.6 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 inches (moderate)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7e
Land capability irrigated: 2e
Ecological site name: Sandy, Desert Shrub
Ecological site number: R042XB012NM
Typical vegetation: Black grama, bush muhly, sand dropseed, mesa dropseed, spike dropseed, other forbs, Arizona cottontop, other perennial grasses, plains bristlegrass, other shrubs, broom dalea, croton, longleaf jointfir, soaptree yucca

OCB—Ojinaga-Corazones complex, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,000 to 4,000 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: 85 percent
Ojinaga and similar soils: 57 percent
Corazones and similar soils: 28 percent
Minor components: 15 percent
Changas soils have more clay and are on lower side slopes: 3 percent
Chillon soils do not have a calcic horizon and are in lower positions: 2 percent
Unnamed soils occur throughout the unit: 10 percent

Soil Description

Ojinaga

Landforms: Fan remnants
Down-slope shape: Convex, linear

Across-slope shape: Convex
Parent material: Gravelly alluvium derived from mixed sources

Typical Profile

A—0 to 3 inches; moderately alkaline gravelly loam
Bk—3 to 10 inches; moderately alkaline very gravelly sandy clay loam
Bkkm—10 to 20 inches; cemented material

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 65 percent subrounded gravel, about 5 percent subrounded cobbles
Depth to first restrictive layer: 6 to 20 inches to petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)
Slowest permeability below the 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: Medium
Flooding frequency: Not flooded

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, slim triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg coldenia

Corazones

Landforms: Fan remnants
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from mixed sources

Typical Profile

A—0 to 3 inches; moderately alkaline very gravelly fine sandy loam
Bk1—3 to 11 inches; moderately alkaline extremely gravelly fine sandy loam
Bk2—11 to 80 inches; moderately alkaline extremely gravelly fine sandy loam

Properties and Qualities

Slope: 1 to 5 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 3 inches (low)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: Not flooded

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, slim triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg coldenia

OCF—Ojinaga-Corazones complex, 1 to 40 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 3,000 to 4,000 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: 91 percent
Ojinaga and similar soils: 55 percent
Corazones and similar soils: 36 percent
Minor components: 9 percent
Unnamed soils occur throughout the unit: 9 percent

Soil Description

Ojinaga

Landforms: Fan remnants
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from mixed sources

Typical Profile

A—0 to 4 inches; moderately alkaline very gravelly sandy clay loam
Bk—4 to 11 inches; moderately alkaline extremely gravelly sandy clay loam
Bkkm—11 to 21 inches; cemented material

Properties and Qualities

Slope: 1 to 5 percent
Percent of area covered by surface fragments: About 69 percent subrounded gravel, about 20 percent subrounded cobbles, about 1 percent subrounded stones
Depth to first restrictive layer: 6 to 20 inches to petrocalcic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (moderately rapid)

Slowest permeability below the 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 inches (very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

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, slim triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg coldenia

Corazones

Landforms: Rolling fan remnants
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from mixed sources

Typical Profile

A—0 to 2 inches; moderately alkaline extremely gravelly sandy clay loam
Bk—2 to 80 inches; moderately alkaline extremely gravelly sandy clay loam

Properties and Qualities

Slope: 5 to 40 percent
Percent of area covered by surface fragments: About 60 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 inches (low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: Not flooded

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, slim triden, false grama, other shrubs, other perennial grasses, ocotillo, leatherstem, threeawn, range ratany, fluffgrass, Gregg coldenia

PAG—Pantak-Rock outcrop complex, 20 to 70 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 93 percent
Pantak and similar soils: 74 percent
Rock outcrop and similar soils: 19 percent
Minor components: 7 percent
Unnamed soils occur throughout the unit: 7 percent

Soil Description

Pantak

Landforms: Hills
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Residuum weathered from igneous rock and/or colluvium derived from igneous rock

Typical Profile

A—0 to 4 inches; neutral very gravelly coarse sandy loam
Bt—4 to 8 inches; neutral very cobbly sandy clay loam
R—8 to 18 inches; igneous bedrock

Properties and Qualities

Slope: 20 to 60 percent
Percent of area covered by surface fragments: About 5 percent subrounded cobbles, about 35 percent subrounded 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 below the 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: Not flooded

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, slim 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: 20 to 70 percent
Depth to first restrictive layer: No restrictive layer
Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

PRA—Pantera-Riverwash complex, 0 to 2 percent slopes, frequently flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Basin floors
Elevation: 3,000 to 4,000 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: 85 percent
Pantera and similar soils: 63 percent
Riverwash and similar soils: 22 percent
Minor components: 15 percent
Chillon soils have more clay and are in slightly higher positions: 4 percent
Corazones soils have a calcic horizon and are in slightly higher positions: 4 percent
Ojinaga soils have a petrocalcic horizon and are in slightly higher positions: 4 percent
Unnamed soils occur throughout the unit: 3 percent

Soil Description

Pantera

Landforms: Arroyos
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Sandy and gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline gravelly loamy coarse sand
C1—3 to 20 inches; moderately alkaline very gravelly coarse sand
C2—20 to 80 inches; moderately alkaline extremely 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: 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 1 inch (very low)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: Frequently flooded

Interpretive Groups

Land capability nonirrigated: 6c
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

Riverwash

Landforms: Arroyos
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Holocene age sandy and gravelly alluvium derived from igneous and sedimentary rock

Typical Profile

C—0 to 80 inches; gravel

Properties and Qualities

Slope: 0 to 2 percent
Percent of area covered by surface fragments: About 1 percent subrounded boulders, about 4 percent subrounded stones, about 5 percent subrounded cobbles, about 55 percent subrounded gravel
Depth to first restrictive layer: No restrictive layer

Slowest soil permeability to 60 inches, above first cemented restrictive layer: Not specified
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: Negligible
Flooding frequency: Frequently flooded

Interpretive Groups

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

RLA—Reyab loam, moist, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days

Composition Estimates

Major components: 85 percent
Reyab moist and similar soils: 85 percent
Minor components: 15 percent
Unnamed soils occur throughout the unit: 15 percent

Soil Description

Reyab soils moist

Landforms: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 11 inches; moderately alkaline loam
Bw—11 to 44 inches; moderately alkaline clay loam
Bk—44 to 80 inches; moderately alkaline loam

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: 0.2 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 12 inches (high)
Natural drainage class: Well drained

Runoff: Negligible
Flooding frequency: Occasionally flooded

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Loamy, Dry Mixed Prairie
Ecological site number: R042XD001NM
Typical vegetation: Blue grama, tobosa, cane bluestem, sideoats grama, other perennial grasses, alkali sacaton, Arizona cottontop, vine mesquite, forb, burrograss, ear muhly, other shrubs

RSA—Reyab silt 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: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Reyab and similar soils: 90 percent
Minor components: 10 percent
Double soils have more sand and are in higher positions: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Soil Description

Reyab

Landforms: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Loamy alluvium derived from igneous and sedimentary rock

Typical Profile

A—0 to 3 inches; moderately alkaline silt loam
Bw—3 to 31 inches; moderately alkaline silt loam, silty clay loam, and clay loam
Bk—31 to 80 inches; moderately alkaline clay loam and loam

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 10 inches (high)
Natural drainage class: Well drained
Runoff: Low

Flooding frequency: Occasionally flooded

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

RXG—Rock outcrop-Lampshire complex, 5 to 60 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 95 percent
Rock outcrop and similar soils: 75 percent
Lampshire and similar soils: 20 percent
Minor components: 5 percent
Unnamed soils occur throughout the unit: 5 percent

Soil Description

Rock outcrop

Landforms: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Granite

Typical Profile

R—0 to 10 inches; granite bedrock

Properties and Qualities

Slope: 5 to 60 percent
Depth to first restrictive layer: No restrictive layer
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
Runoff: Very high
Flooding frequency: None

Interpretive Groups

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

Lampshire

Landforms: Hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly colluvium derived from granite and/or gravelly residuum weathered from granite (fig. 13)

Typical Profile

A—0 to 4 inches; neutral very gravelly coarse sandy loam
R—4 to 14 inches; granite bedrock

Properties and Qualities

Slope: 5 to 60 percent
Percent of area covered by surface fragments: About 50 percent 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

Figure 11.—An area of Rock outcrop-Lampshire complex, 5 to 60 percent slopes. Lampshire soils formed from granite, and granite exposures of rock outcrop can be seen in this photograph. Lampshire soils are in the Igneous Hill and Mountain ecological site, Desert Grassland vegetative zone.

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 (fig. 11)
Ecological site number: R042XC247TX
Typical vegetation: Black grama, sideoats grama, tanglehead, other forbs, other shrubs, slim triden, hairy grama, Arizona cottontop, bush muhly, other perennial grasses, creosotebush, skeletonleaf goldeneye, range ratany

STB—Stovall clay loam, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Intermontane basins
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Stovall and similar soils: 90 percent
Minor components: 10 percent
Bissett soils are shallow to bedrock and occur on higher positions: 3 percent
Dellahunt soils have gypsum in the profile and occur on similar positions: 3 percent
Unnamed soils occur throughout the unit: 4 percent

Soil Description

Stovall

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

Typical Profile

A—0 to 12 inches; slightly alkaline clay loam
Bw—12 to 23 inches; moderately alkaline clay loam
Bk—23 to 80 inches; moderately alkaline silt 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: 0.6 to 2.0 in/hr (moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 8 inches (moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6c
Land capability irrigated: 2e
Ecological site name: Loamy, Desert Grassland (fig. 12)
Ecological site number: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, tarbush

TEC—Tenneco silt loam, moist, 3 to 8 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Piedmont slopes
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days

Figure 12.—Rangeland on an area of Stovall clay loam, 0 to 3 percent slopes. Vegetation consists of burrograss, tarbush, and creosotebush. Stovall soils are in the Loamy ecological site, Desert Grassland vegetative zone.

Composition Estimates

Major components: 85 percent
Tenneco and similar soils: 85 percent
Minor components: 15 percent
Culberspeth moist soils have a petrocalcic horizon and are in slightly higher positions: 7 percent
Kahn moist soils have a calcic horizon and are in similar positions: 7 percent
Unnamed soils occur throughout the unit: 1 percent

Soil Description

Tenneco

Landforms: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from mixed sources

Typical Profile

A—0 to 7 inches; moderately alkaline silt loam
Bk1—7 to 42 inches; moderately alkaline silt loam
Bk2—42 to 61 inches; moderately alkaline loam
Bkk—61 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 3 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: 0.6 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 12 inches (high)
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: R042XC007NM
Typical vegetation: Black grama, blue grama, tobosa, Arizona cottontop, bush muhly, other forbs, other perennial grasses, plains bristlegrass, sideoats grama, cane bluestem, other shrubs, burrograss, tarbush

VDA—Verhalen-Dalby association, 0 to 1 percent slopes, rarely flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 90 percent
Verhalen and similar soils: 65 percent
Dalby and similar soils: 25 percent
Minor components: 10 percent
Unnamed soils occur throughout the unit: 10 percent

Soil Description

Verhalen

Landforms: Basin floors
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Clayey alluvium

Typical Profile

Ap—0 to 8 inches; neutral silty clay
Bss1—8 to 27 inches; slightly alkaline clay
Bss2—27 to 80 inches; moderately alkaline clay

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: 0.001 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 inches (high)
Natural drainage class: Moderately well drained
Runoff: Low
Flooding frequency: Rarely flooded

Interpretive Groups

Land capability nonirrigated: 6c
Land capability irrigated: 2s
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

Dalby

Landforms: Basin floors (fig. 13)
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Clayey alluvium

Typical Profile

Ap1—0 to 5 inches; slightly alkaline silty clay loam
Ap2—5 to 11 inches; moderately alkaline silty clay

Figure 13.—Surface cracking on Dalby soils in an area of Verhalen-Dalby association, 0 to 1 percent slopes, rarely flooded. The high amount of clay and lack of moisture dries out these soils and cracking develops. Dalby soils are on basin floors.

Bss—11 to 33 inches; moderately alkaline clay
Bk—33 to 80 inches; moderately alkaline clay

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: 0.001 to 0.06 in/hr (very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8 inches (moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Rarely flooded

Interpretive Groups

Land capability nonirrigated: 6c
Land capability irrigated: 2s
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

WAB—Walkerwells silty clay loam, 0 to 3 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Karst
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Composition Estimates

Major components: 80 percent
Walkerwells and similar soils: 80 percent
Minor components: 20 percent
Dellahunt soils are not stratified and are in slightly higher positions: 12 percent
Joberanch soils have a petrogypsic horizon and are in higher positions: 3 percent
Unnamed soils occur throughout the unit: 5 percent

Soil Description

Walkerwells

Landforms: Drainageways, flood plains
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Loamy alluvium derived from rock gypsum and/or loamy alluvium derived from sandstone

Typical Profile

A—0 to 9 inches; moderately alkaline silty clay loam
Ab—9 to 26 inches; moderately alkaline silty clay loam
Bwb—26 to 50 inches; moderately alkaline silty clay loam and silty clay
Byb—50 to 80 inches; strongly alkaline silty clay

Properties and Qualities

Slope: 0 to 3 percent
Percent of area covered by surface fragments: About 1 percent fine 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 10 inches (high)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Occasionally flooded

Interpretive Groups

Land capability nonirrigated: 6c
Ecological site name: Bottomland, Desert Grassland
Ecological site number: R042XC017NM
Typical vegetation: Giant sacaton, alkali sacaton, other forbs, vine mesquite, cane bluestem, plains bristlegrass, false Rhodes grass, other perennial grasses, fourwing saltbush, other shrubs, tarbush

YAG—Yarbam-Rock outcrop complex, 35 to 65 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Composition Estimates

Major components: 90 percent
Yarbam and similar soils: 60 percent
Rock outcrop and similar soils: 30 percent
Minor components: 10 percent
Unnamed soils occur throughout the unit: 10 percent

Soil Description

Yarbam

Landforms: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from limestone

Typical Profile

A—0 to 6 inches; moderately alkaline very gravelly loam
Bk—6 to 15 inches; moderately alkaline very gravelly loam
R—15 to 25 inches; limestone bedrock

Properties and Qualities

Slope: 35 to 65 percent
Percent of area covered by surface fragments: About 15 percent subrounded cobbles, about 30 percent subrounded gravel
Depth to first restrictive layer: 8 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 below the 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 inch (very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Limestone Hill and Mountain, Mixed Prairie
Ecological site number: R042XE278TX
Typical vegetation: Blue grama, sideoats grama, curlyleaf muhly, little bluestem, New Mexico feathergrass, other perennial grasses, green sprangletop, other shrubs, Mexican pinyon, other forbs, redberry juniper, wavyleaf oak, agarito, New Mexico muhly

Rock outcrop

Landforms: Mountainsides
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarsely-fractured limestone

Typical Profile

R—0 to 10 inches; limestone bedrock

Properties and Qualities

Slope: 35 to 65 percent
Depth to first restrictive layer: No restrictive layer
Slowest permeability below the 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
Runoff: Very high
Flooding frequency: Not flooded

Interpretive Groups

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

YLA—Yesum-Loki-Corvus complex, 0 to 1 percent slopes

Setting

Major land resource area: MLRA 42—Southern Desertic Basins, Plains, and Mountains
Landscape: Bolsons
Elevation: 3,000 to 4,000 feet
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Composition Estimates

Major components: 93 percent
Yesum and similar soils: 50 percent

Loki and similar soils: 27 percent
Corvus and similar soils: 16 percent
Minor components: 7 percent
Unnamed soils occur throughout the unit: 7 percent

Soil Description

Yesum

Landforms: Alluvial flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gypsiferous loamy alluvium and/or gypsiferous eolian deposits

Typical Profile

Apy—0 to 8 inches; slightly alkaline silt loam
Byy—8 to 21 inches; slightly alkaline gypsiferous silt loam
Bkyy—21 to 80 inches; slightly alkaline gypsiferous silt loam

Properties and Qualities

Slope: 0 to 1 percent
Percent of area covered by surface fragments: About 3 percent subangular 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 12 inches (high)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Land capability irrigated: 3s
Ecological site name: Gyp Upland, Desert Shrub
Ecological site number: R042XB006NM
Typical vegetation: Black grama, alkali sacaton, fourwing saltbush, other forbs, gyp grama, other perennial grasses, gyp dropseed, plains bristlegrass, allthorn, hairy coldenia, other shrubs

Loki

Landforms: Alluvial flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over gypsiferous lacustrine deposits

Typical Profile

Apy—0 to 3 inches; moderately alkaline loam
Bky—3 to 14 inches; moderately alkaline silt loam
Byy—14 to 80 inches; moderately alkaline gypsiferous silt loam

Properties and Qualities

Slope: 0 to 1 percent
Percent of area covered by surface fragments: About 3 percent subangular 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 12 inches (high)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Land capability irrigated: 3s
Ecological site name: Gyp Upland, Desert Shrub
Ecological site number: R042XB006NM
Typical vegetation: Black grama, alkali sacaton, fourwing saltbush, other forbs, gyp grama, other perennial grasses, gyp dropseed, plains bristlegrass, allthorn, hairy coldenia, other shrubs

Corvus

Landforms: Alluvial flats
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Gypsiferous eolian deposits

Typical Profile

Apyy—0 to 6 inches; slightly alkaline gypsiferous silt loam
Byy—6 to 10 inches; slightly alkaline gypsiferous silt loam
Byym—10 to 22 inches; cemented material

Properties and Qualities

Slope: 0 to 1 percent
Percent of area covered by surface fragments: About 3 percent subangular gravel
Depth to first restrictive layer: 6 to 12 inches to petrogypsic
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (moderate)
Slowest permeability below the 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: Saline
Sodicity, representative within 40 inches: Sodic
Sodicity, maximum within 40 inches: Sodic
Representative total available water capacity to 60 inches: About 1 inch (very low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: 7s
Land capability irrigated: 3s
Ecological site name: Gyp Outcrop, Desert Shrub
Ecological site number: R042XB007NM
Typical vegetation: Gyp grama, hairy coldenia, gyp dropseed, other forbs, other shrubs, fourwing saltbush, other perennial grasses, Torrey ephedra, gypsum moonpod

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 descriptive and numerical.

Rating Class Terms

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

Culberson County has approximately 37,000 acres of irrigated cropland. The irrigated cropland is found north of Van Horn in the Wild Horse Valley, east of Van Horn at Michigan Flat, south of Van Horn in Lobo Valley, and at Diablo Farms in northwestern Culberson County. The main crops are alfalfa, pecans, corn, wheat, cotton, sudan, improved Bermuda grass, and rye grass.

There is no dryland farming in Culberson County because of the lack of sufficient rainfall. The suitability of each soil for use as cropland is shown in Table 5 and is indicated by the capability classification given at the end of each map unit description in the section “Detailed Soil Map Units.”

Figure 14.—Improved grasses on an area of McAllister fine sandy loam, 0 to 3 percent slopes. Because of the droughty west Texas climate, supplemental irrigation is needed to produce forage for cattle.

Figure 15.—A pecan orchard on an area of McAllister fine sandy loam, 0 to 3 percent slopes.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes. Capability classes are listed for each map unit in the section "Detailed Soil Map Units" and are shown in Table 5.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA NRCS, 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, USDA 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 2.3 million acres, of Culberson County is rangeland. Less than one percent is cultivated for either cropland or pastureland. Culberson County rangelands are used mostly for livestock grazing, wildlife habitat, and recreation. 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 to 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 landowners regarding the direction of change in plant community in response to present management.

Rangeland health is a determination of how the ecological processes on a rangeland ecological site are functioning. Ecological processes evaluated include water cycle, nutrient cycle, and energy flow.

It is also recognized that several plant communities may exist within one ecological site. In some cases, the management objectives may be a plant community other than the historical plant community. This is referred to as the desired plant community. These are acceptable plant communities as long as the soil, water, air, plant, and animal resources are being met.

Similarity index, rangeland trend, and rangeland health are all utilized in the management of desired plant communities. When working with the desired plant community, similarity index is a comparison of the present plant community to the desired plant community. Range health, along with planned trend, are assessment tools to evaluate whether or not a desired plant community is acceptable for the rangeland resource.

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 Culberson County include prescribed grazing, stock-water developments, and fences. If undesirable woody plants and shrubs 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. Five major vegetative zones that coincide with major climatic breaks have been identified in the county: Desert Shrub, Hot Desert

Shrub, Desert Grassland, Dry Mixed Prairie, and 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.

A typical growth curve for native vegetation representing the percentage of total growth occurring each month for the Desert Shrub vegetative zone would be:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0	0	5	8	10	12	30	20	10	5	0	0

A typical growth curve for native vegetation representing the percentage of total growth occurring each month for the Hot Desert Shrub, Desert Grassland, and Mixed Prairie vegetative zones would be:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	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 Dry Mixed Prairie vegetative zone would be:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1	1	1	3	3	10	15	25	25	10	5	1

These growth curves show that in Culberson 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 6 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 average 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.

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 country 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 interpretive ratings found in Table 7, 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 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.

Grazing Land Pipelines and Fencing

Livestock watering pipelines 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.

Excavations to 24 inches for plastic pipeline soil interpretations shown in Table 8, 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.

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.

Fencing, Post Depth (=<24 inches) soil interpretations shown in Table 8, 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.

Fencing, Post Depth (=<36 inches) soil interpretations shown in Table 8, is of a 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 26 ecological sites have been identified in Culberson County. Below is a general description of the various vegetative zones located within the Southern Desertic Basins, Plains, and Mountains Major Land Resource Area (MLRA 42) and ecological sites occurring within Culberson County. The composition of the reference plant community is given for each site. A brief description on plant community dynamics is given.

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 recogonized 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.

Desert Shrub Vegetative Zone

The Desert Shrub Vegetative Zone occurs mostly within the Salt Basin in the north central portion of the county. Elevation ranges from 3,000 to 4,000 feet. Mean annual precipitation ranges from 8 to 11 inches and occurs predominantly during the hot summer months as high intensity storms. The desert shrub is generally cooler and drier than the Hot Desert Shrub Vegetative Zone which occurs in the southernmost portion of the County. The Desert Shrub zone within Culberson County supports a sparse cover of mostly gypsiferous grasses, forbs, and shrubs. The majority of this vegetative zone is not suited for common rangeland improvement practices such as seeding, brush control, and prescribed fire.

Characteristic vegetation includes gyp grama, gyp dropseed, alkali sacaton, sand dropseed, rough coldenia, fourwing saltbush, Torrey's ephedra, gyp moonpod, and gyp nama.

Gyp Outcrop Ecological Site. This ecological site in the Desert Shrub Vegetative Zone includes soil mapping units; the Corvus part of YLA—Yesum-Loki-Corvus complex, 0 to 1 percent slopes; and the Corvus and Peligro parts of CTC—Corvus-Peligro-Yesum complex, 1 to 8 percent slopes.

This site occurs on nearly level to strongly sloping relict stabilized gypsum dunes and alluvial flats. Soils are very shallow, shallow, and very deep, well drained and formed in gypsiferous eolian deposits. The climax plant community is a very sparse dwarf shrubland consisting of mostly gypsofiles.

The composition by weight of the reference plant community is approximately 25 percent gyp grama; 15 percent gyp dropseed; 5 percent other grasses; 25 percent rough coldenia; 5 percent Torrey's ephedra; 2 percent soaptree yucca; 8 percent other shrubs; 2 percent gyp moonpod; 13 percent other forbs; 21 percent other shrubs and forbs.

This site provides limited livestock grazing potential because of low productivity of the site. However, gyp grama will likely be the first to decrease with continuous heavy grazing. Rough coldenia will increase with any surface disturbances that remove important biological crusts and expose the gypsiferous surface.

Gyp Playa Ecological Site. This ecological site in the Desert Shrub Vegetative Zone includes soil mapping unit; GAA—Gypsic Aquisalids, 0 to 2 percent slopes, occasionally flooded.

This site occurs on nearly level to gently sloping basin floors. Soils are very deep, poorly drained, and were formed in gypsiferous lacustrine deposits. The site is normally devoid of vegetation because of occasional flooding. Vegetation is typically restricted to a thin strip along the edge of the playas where flooding does not occur. Characteristic vegetation that does occur on this site is limited to inland saltgrass, alkali sacaton, iodinebush, and annual forbs.

Gyp Upland Ecological Site. This ecological site in the Desert Shrub Vegetative Zone includes soil mapping units; the Yesum and Loki parts of YLA—Yesum-Loki-Corvus complex, 0 to 1 percent slopes; and the Yesum part of CTC—Corvus-Peligro-Yesum complex, 1 to 8 percent slopes.

This site occurs on nearly level to strongly sloping alluvial flats and relict stabilized gypsum dunes. Soils are very deep, well drained and formed in loamy alluvium over gypsiferous lacustrine deposits, gypsiferous loamy alluvium, and gypsiferous eolian deposits. The climax community consists of drought tolerant shrubs, grasses, and forbs.

The composition by weight of the reference plant community is approximately 45 percent alkali sacaton; 10 percent black grama; 15 percent gyp grama and gyp dropseed; 5 percent plains bristlegrass; 10 percent fourwing saltbush; 2 percent rough coldenia; 10 percent forbs; and 3 percent other shrubs and grasses. Heavy continuous grazing may reduce the grama grasses and fourwing saltbush while rough coldenia and gyp dropseed will increase in dominance. Alkali sacaton will decrease with further heavy continuous

grazing. Western honey mesquite and tarbush may also increase with site degradation if a seed source is available.

Sandy Ecological Site. This ecological site in the Desert Shrub Vegetative Zone includes soil mapping units; MHA—Monahans fine sandy loam, 0 to 2 percent slopes.

This site occurs on nearly level to gently sloping fan skirts on fan piedmonts. Soils are very deep, well drained and formed in calcareous and gypsiferous loamy alluvium. The climax plant community consists of drought tolerant shrubs, grasses, and forbs.

The composition by weight of the reference plant community is approximately 25 percent black grama; 12 percent sand dropseed; 20 percent spike dropseed and mesa dropseed; 10 percent bush muhly; 10 percent plains bristlegrass and Arizona cottontop; 5 percent other grasses; 2 percent soaptree yucca; 4 percent longleaf ephedra and broom dalea; 4 percent other shrubs; 2 percent grassland croton; 6 percent other shrubs.

Continuous heavy grazing will cause a decrease in plants such as black grama, bush muhly, plains bristlegrass, and Arizona cottontop while grasses such as mesa dropseed, sand dropseed, and perennial threeawn will initially increase. Under further heavy continuous grazing, the dropseeds and most other grasses will decrease. Loss of perennial herbaceous vegetation will allow the site to be highly susceptible to wind erosion.

Vegetated Gyp Dunes Ecological Site. This ecological site in the Desert Shrub Vegetative Zone includes soil mapping units; LRE—Lark gypsiferous sand, 5 to 20 percent slopes.

This site occurs on gently sloping to moderately steep lunette playa dunes. Soils are very deep, somewhat excessively drained, and formed in gypsiferous eolian sands. The climax community consists of a sparse cover of drought tolerant shrubs, grasses, and forbs.

The composition by weight of the reference plant community is approximately 25 percent gyp grama; 5 percent Indian ricegrass; 20 percent rosemary mint; 25 percent fourwing saltbush and soaptree yucca; 10 percent hairy coldenia and Torrey's ephedra; 10 percent forbs; 5 percent other shrubs and grasses.

This site provides limited livestock grazing potential because of the rather unstable and moderately steep sand dunes. Burying of plants by windblown sands is one of the major disturbances on the site. The plant communities are very dynamic on this site.

Hot Desert Shrub Vegetative Zone

The Hot Desert Shrub Vegetative Zone occurs along the Rio Grande and is located within the lowest elevations, about 3,000 to 4,000 feet. Mean annual precipitation ranges from about 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 less than 72 degrees F). Air temperatures above 100°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 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 Ecological Site. This ecological site in the Hot Desert Shrub Vegetative Zone includes soil mapping units; the Pantera part of PRA—Pantera-Riverwash complex, 0 to 2 percent slopes, frequently flooded.

This site occurs on nearly level to gently sloping arroyos. Soils are very deep, well drained, and formed in sandy 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 groundwater.

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, slim 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 acacia. 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.

Gravelly Ecological Site. This ecological site in the Hot Desert Shrub Vegetative Zone includes soil mapping units; the Corazones part of CCE—Changas-Corazones complex, 1 to 30 percent slopes; CIB—Chillon extremely gravelly sandy loam, 1 to 3 percent slopes; OCB—Ojinaga-Corazones complex, 1 to 5 percent slopes (fig. 16); and OCF—Ojinaga-Corazones complex, 1 to 40 percent slopes.

The site occurs on nearly level to steep fan remnants and stream terraces. Soils are very shallow, shallow, and very deep well drained soils that formed in gravelly alluvium. The historic climax plant community consists of predominantly drought tolerant mid and shortgrasses with scattered woody shrubs and occasional forbs.

The characteristic vegetation consists of approximately 35 percent chino grama; 15 percent feather pappusgrass, slim triden, and 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, and 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 grasses, and palatable shrubs and forbs on over utilized areas.

Salty Clay Hill Ecological Site. This ecological site in the Hot Desert Shrub Vegetative Zone includes soil mapping units; the Changas part of CCE—Changas-Corazones complex, 1 to 30 percent slopes. (fig. 17)

This site occurs on gently sloping to steep erosional fan remnants. Soils are very deep, well drained and formed in gypsiferous clayey lacustrine deposits. A sparse community of drought tolerant shrubs and infrequent grasses characterize 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.

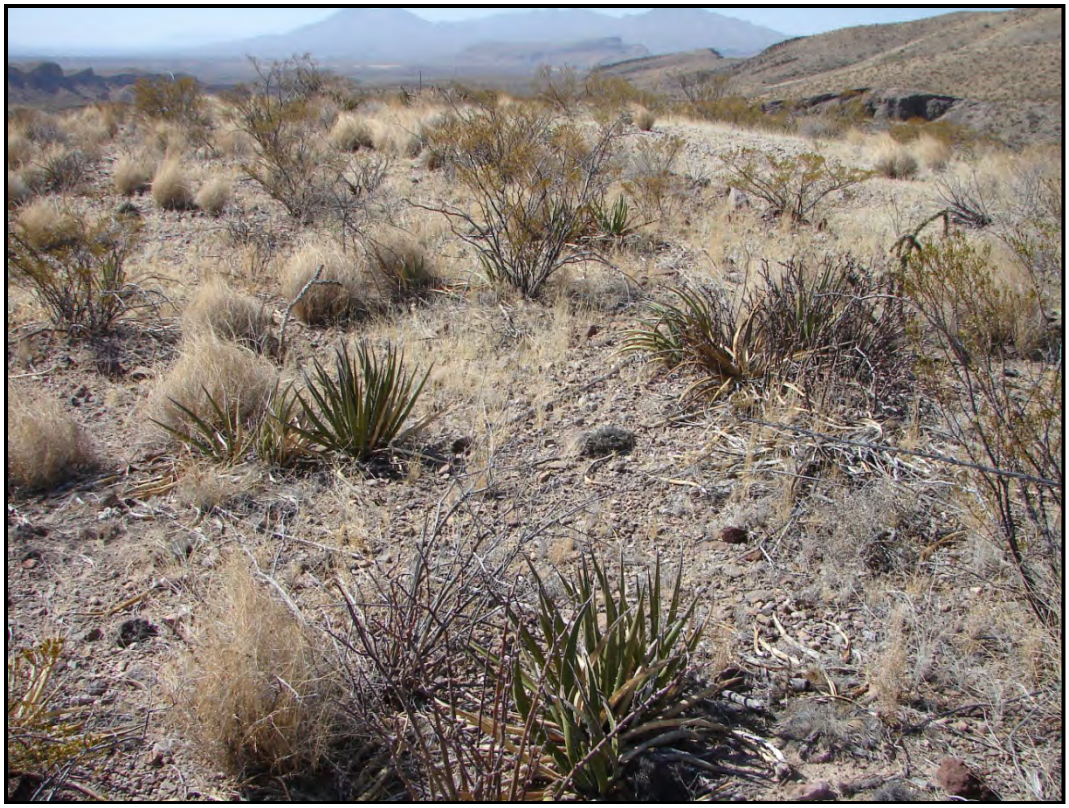

Figure 16.—Rangeland on an area of Ojinaga-Corazones complex, 1 to 5 percent slopes. Native vegetation consists of Chino grama, fluffgrass, creosotebush, leatherstem, and lechuguilla. This map unit is in the Gravelly ecological site, Hot Desert Shrub vegetative zone.

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.

Desert Grassland Vegetative Zone

The Desert Grassland vegetative zone is mostly at elevations of 4,000 to 5,500 feet. Mean annual precipitation ranges from about 12 to 16 inches and occurs predominantly during the hot summer months as high intensity storms. Consequently, effective precipitation for plant growth is low. The climate and soils support a grass/shrub mix.

The climax vegetation is mainly such short grasses as black grama, burrograss, tobosa, and mid grasses 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, acacia, and mesquite have encroached on many sites because of historic overgrazing by livestock. Brush management practices are often prescribed within this zone.

Arroyo Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping unit; the Chipotle part of CLA—Chipotle-Riverwash complex, 0 to 2 percent slopes, frequently flooded.

This site occurs on nearly level to gently sloping arroyos. Soils are very deep, well drained, and formed in 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 17.—Changas soils in an area of Changas-Corazones complex, 1 to 30 percent slopes. Native vegetation consists of tobosa, Chino grama, mound saltbush, and creosotebush. The Changas soils are in the Salty Clay Hill ecological site, Hot Desert Shrub 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, plains bristlegrass, and cane bluestem while fluffgrass, threeawn, slim 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 acacia. 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. Since 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.

Bottomland Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping units; WAB—Walkerwells silty clay loam, 0 to 3 percent slopes, occasionally flooded; and the Walkerwells part of EPE—Elcor-Pokorny-Hollomex-Walkerwells complex, 0 to 30 percent slopes.

This site occurs on nearly level to gently sloping flood plains and drainageways of karst landscapes. Soils are very deep, well drained and were formed in loamy alluvium.

The climax plant community is a giant sacaton dominated grassland with scattered shrubs and forbs.

The climax plant community consists of approximately 50 percent giant sacaton; 10 percent alkali sacaton; 10 percent vine mesquite and plains bristlegrass; 10 percent cane bluestem and false Rhodes grass, 5 percent other grasses; 3 percent fourwing saltbush; 3 percent tarbush and western honey mesquite; 2 percent other shrubs; and 7 percent forbs.

Under heavy continuous grazing plants that initially decrease are vine mesquite, plains bristlegrass, and fourwing saltbush while giant sacaton will increase in dominance and shrubs such as tarbush and western honey mesquite will increase or invade.

Clay Flat Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping unit; VDA—Verhalen-Dalby association, 0 to 1 percent slopes, rarely flooded.

This site usually occurs on broad, nearly level basin floors, 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. Soils are very deep, well and moderately well drained, and formed in clayey alluvium. 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 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; 3 percent other grasses; 5 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 Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping unit; RSA—Reyab silt loam, 0 to 2 percent slopes, occasionally flooded.

This site occurs on narrow, frequently overflowed, nearly level to gently sloping flood plains which receive runoff water from adjoining sites and remote higher elevations. Soils are very deep, well drained, and formed in loamy alluvium. This site has the appearance of a savannah with trees and shrubs being dominant in aspect. However, tall bunchgrasses, mid grasses, rhizomatous, and stoloniferous short grasses have the greatest annual production. There is also an abundant variety of forbs in the understory. The soils on this site 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 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 mid grasses such as sideoats grama and cane bluestem decrease while the short grasses such as blue grama, tobosa, and burrograss initially increase and eventually replace the mid grasses. Other short grasses and forbs such as groundsels, ragweed, sneezeweed, broom snakeweed, and paper flower increase or invade the site. With continued site deterioration, woody plants such as tarbush, whitebrush, mesquite, lotebush, creosotebush, and cacti increase.

Gravelly Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping units; the Chispa part of CPC—Chispa-Tenneco complex, 0 to 8 percent slopes; COC—Chispa-Chilicotal complex, 1 to 8 percent slopes; CVC—Culberspeth-Chilicotal complex, 1 to 8 percent slopes; and CHC—Chilicotal very gravelly loam, 1 to 8 percent slopes.

The site occurs on nearly level to strongly sloping alluvial fans and fan remnants. Soils are very shallow, shallow, and very deep well drained soils that formed in gravelly and loamy alluvium, gravelly colluvium, fan gravelly alluvium, and gravelly pedisediment. The climax plant community consists of predominantly drought tolerant mid and shortgrasses 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 climax plant community consists of approximately 30 percent black grama and bush muhly; 15 percent Arizona cottontop, slim 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.

Gyp Alluvium Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping units; the Pokorny part of EPA—Elcor-Dellahunt-Pokorny complex, 0 to 2 percent slopes (fig. 18); and the Pokorny part of EPE—Elcor-Pokorny-Hollomex-Walkerwells complex, 0 to 30 percent slopes; and the Pokorny part of HPC—Hollobeke-Pokorny complex, 1 to 8 percent slopes.

This site occurs on nearly level to strongly sloping alluvial flats and terraces of karst landscapes. Soils are very shallow or shallow, well drained soils that formed in gypsiferous alluvium. The climax plant community consists of predominantly drought tolerant mid and shortgrasses with scattered woody shrubs, trees, and occasional forbs.

The climax plant community consists of approximately 25 percent gyp grama; 20 percent gyp dropseed; 5 percent alkali sacation; 5 percent other grasses; 15 percent littleleaf sumac and fourwing saltbush; 10 percent agarito and soaptree yucca; 5 percent oneseed juniper; 5 percent other shrubs; 2 percent gyp nama; and 8 percent other forbs.

Under continuous heavy grazing, gyp grama and eventually alkali sacaton and gyp dropseed. Shrubs such as acacia and western honey mesquite typically encroach within this site.

Gyp Hill Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping units; Elcor gypsiferous loam, 1 to 8 percent slopes; ELE—Elcor gypsiferous loam, 5 to 30 percent slopes (fig. 19); the Hollobeke part of HPC—Hollobeke-Pokorny complex, 1 to 8 percent slopes; the Elcor part of Elcor-Dellahunt-Pokorny complex, 0 to 2 percent slopes; and the Elcor and Hollomex parts of Elcor-Pokorny-Hollomex-Walkerwells complex, 0 to 30 percent slopes.

This site occurs on nearly level to steep hills, low hills, and terraces of karst landscapes. Soils are very shallow, shallow, and very deep well drained, and were

Figure 18.—Rangeland on an area of Elcor-Dellahunt-Pokorny complex, 0 to 2 percent slopes. Native vegetation consists of gyp grama, gyp dropseed, littleleaf sumac, allthorn, rough coldenia, and soaptree yucca. The Pokorny soils are in the Gyp Alluvium ecological site, Desert Grassland vegetative zone.

formed in residuum weathered from rock gypsum and calcareous and gypsiferous loamy alluvium from rock gypsum. The climax plant community is a very sparse dwarf shrubland consisting of mostly gypsofiles.

The climax plant community consists of approximately 25 percent gyp grama; 20 percent gyp dropseed; 5 percent feather pappusgrass; 2 percent other grasses; 25 percent rough coldenia; 8 percent Torrey's ephedra and rosemary mint; 2 percent other shrubs; 5 percent gyp nama and gyp moonpod; and 8 percent other forbs.

This site provides limited livestock grazing potential because of low productivity of the site. However, gyp grama will likely be the first to decrease with continuous heavy grazing. Rough coldenia will increase with any surface disturbances that remove important biological crusts and expose the gypsiferous surface.

Igneous Hill and Mountain Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping units; BVC—Bofecillos-Leyva complex, 1 to 8 percent slopes; BVE—Bofecillos-Leyva-Horsetrap complex, 10 to 30 percent slopes; HRC—Horsetrap-Bofecillos complex, 1 to 8 percent slopes; LPG—Lampshire-Pantak complex, 10 to 60 percent slopes; the Pantak part of PAG—Pantak-Rock outcrop complex, 20 to 70 percent slopes; and the Lampshire part of RXG—Rock outcrop-Lampshire complex, 5 to 60 percent slopes. (fig. 20)

This site occurs on nearly level to very steep hills and low hills. Soils are very shallow and shallow, well drained, 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.

Figure 19.—Rangeland on an area of Elcor gypsiferous loam, 5 to 30 percent slopes. Native vegetation consists of gyp grama, gyp dropseed, rough coldenia, gyp nama. Notice the areas of biological crust, which is important for nitrogen fixation. Elcor soils are in the Gyp Hill ecological site, Desert Grassland vegetative zone.

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, slim 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 slim 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 Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping units; the Bissett parts of BID—Bissett-Rock outcrop complex, 3 to 16 percent slopes; BIE—Bissett-Rock outcrop complex, 10 to 30 percent slopes; BIG—Bissett-Rock outcrop complex, 20 to 60 percent slopes; BHE—Bissett-Beach complex, 10 to 30 percent slopes; and BSG—Bissett-Rock outcrop-Beach complex, 20 to 70 percent slopes.

This site occurs on gently sloping to very steep hills, ridges, and mountain slopes. Soils are very shallow or shallow, well drained, and formed in residuum and colluvium

Figure 20.—An area of Rock outcrop-Lampshire complex, 5 to 60 percent slopes. This map unit is in the Igneous Hill and Mountain ecological site, Desert Grassland vegetative zone.

weathered from limestone bedrock. The climax plant community consists of short and mid grasses 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 slim triden, fall witchgrass, fluffgrass, and perennial threeawn; 10 percent other grasses; 5 percent perennial forbs such as menodora, bushsunflower, dalea, 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 acacia, 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, slim triden, acacia, lechuguilla, and other woody species will increase.

Loamy Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping units; ANB—Antbed loam, 0 to 3 percent slopes; DEB—Dellahunt silt loam, 0 to 5 percent slopes, occasionally flooded; DNB—Dellahunt-Niemahr-Joberanch complex, 1 to 3 percent slopes; the Dellahunt part of EPA—Elcor-Dellahunt-Pokorny complex, 0 to 2 percent slopes (fig. 21); DOC—Double loam, 1 to 8 percent slopes; MAB—McAllister fine sandy loam, 0 to 3 percent slopes; MCB—Michigan clay, 0 to 3 percent slopes; STB—Stovall clay loam, 0 to 3 percent slopes; TEC—Tenneco silt loam, moist, 3 to 8 percent slopes; and the Tenneco part of CPC—Chispa-Tenneco complex, 0 to 8 percent slopes.

This site occurs on nearly level to strongly sloping alluvial flats and alluvial fans. Soils are very shallow, shallow, and very deep, well drained and formed in alluvium. This ecological site is dominated by drought tolerant short and mid grasses with shrubs and

Figure 21.—Rangeland on an area of Dellahunt-Neimahr-Joberanch complex, 1 to 3 percent slopes. Native vegetation consists of burrograss, blue grama, ear muhly, tobosa, creosotebush, tarbush, fourwing saltbush, western honey mesquite, and cholla. The soils in this map unit are in the Loamy ecological site, Desert Grassland vegetative zone.

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, allthorn, creosotebush, and javelinabush will increase. Herbaceous species such as fluffgrass, sixweeks grama, annual threeawn, dogweed, and broom snakeweed also invade the site under severe deterioration.

Sandstone Hill and Mountain Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping units; the Allamore and Beach parts of ABE—Allamore-Beach-Rock outcrop complex, 5 to 30 percent slopes; the Allamore and Beach parts of BCG—Beach-Allamore-Rock outcrop complex, 20 to 70 percent slopes; BBC—Beach very cobbly sandy loam, 1 to 8 percent slopes; BBD—Beach very gravelly coarse sandy loam, 5 to 16 percent slopes; the Beach part of BHE—Bissett-Beach

complex, 10 to 30 percent slopes; and the Beach part of BSG—Bissett-Rock outcrop-Beach complex, 20 to 70 percent slopes.

This site occurs on nearly level to very steep hills and low hills. Soils are very shallow or shallow, well drained, and formed in residuum weathered from sandstone bedrock. The climax plant community is characterized by mid and short grasses with an abundance and large variety of forbs and woody shrubs.

The climax plant community consists of approximately 25 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 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 tridens; 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 forestiera; 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 tridens, burrograss, and fluffgrass will increase. Woody species such as catclaw, creosote, whitethorn acacia, and mesquite continue to increase as retrogression occurs.

Sandy Loam Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping unit; the Kinco and Perilla parts of KPB—Kinco-Aguena-Perilla complex, 1 to 5 percent slopes.

This site occurs on nearly level to strongly sloping alluvial flats. Soils are very deep, well and somewhat excessively drained, and formed in loamy alluvium derived from igneous and sedimentary rock. The climax plant community is characterized by mid and short grasses with an abundance and large variety of forbs and shrubs.

The 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 slim triden will increase. Woody species such as catclaw, creosotebush, and whitethorn acacia continue to increase as retrogression occurs.

Sand Hills Ecological Site. This ecological site in the Desert Grassland Vegetative Zone includes soil mapping units; AAD—Aguena loamy fine sand, 1 to 10 percent slopes; and the Aguena part of KPB—Kinco-Aguena-Perilla complex, 1 to 5 percent slopes (fig. 22).

This site occurs on nearly level to strongly sloping sand dunes. Soils are very deep, excessively drained, and were formed in eolian sands from mixed sources. The climax plant community consists of drought tolerant shrubs, grasses, and forbs.

The climax plant community consists of approximately 55 percent giant dropseed, spike dropseed, sand dropseed, and mesa dropseed; 15 percent black grama, plains bristlegrass, and sideoats grama; 5 percent other grasses; 5 percent western honey mesquite, 8 percent sand sagebrush, fourwing saltbush, and javelinabush; 2 percent soaptree yucca; 5 percent other shrubs; 2 percent grassland croton; 3 percent other shrubs.

Continuous heavy grazing will cause a decrease in plants such as black grama, plains bristlegrass, and Arizona cottontop while grasses such as mesa dropseed, sand dropseed, and perennial threeawn will initially increase. Under further heavy continuous grazing, the dropseeds and most other grasses will decrease. Loss of perennial herbaceous vegetation will allow the site to be highly susceptible to wind erosion.

Figure 22.—Sandsage, javelinabush, soaptree yucca, pepperweed, and sand dropseed on an area of Kinco-Aguena-Perilla complex, 1 to 5 percent slopes. The Aguena series is in the Sand Hills ecological site, Desert Grassland vegetation zone.

Dry Mixed Prairie Vegetative Zone

The Dry Mixed Prairie vegetative zone occurs mostly at elevations of 4,000 to 5,500 feet. Mean annual precipitation ranges from 14 to 17 inches. The climate and soils support mostly mid grass and shortgrass grasslands with scattered shrubs and forbs.

Characteristic plants include black grama, blue grama, sideoats grama, curlyleaf muhly, sand dropseed, New Mexico feathergrass, winterfat, sotol, javelinabush, and banana yucca.

Gravelly Ecological Site. This ecological site in the Dry Mixed Prairie Vegetative Zone includes soil mapping unit; the Culberspeth, moist part of CWC—Culberspeth-Kahn complex, moist, 1 to 8 percent slopes.

This site occurs on nearly level to strongly sloping fan remnants. Soils are very shallow and shallow to a petrocalcic horizon. They are well drained and formed in colluvium and alluvium. The climax plant community is dominated by mid and short grasses with few scattered shrubs and forbs.

The climax plant community consists of approximately 30 percent black grama; 15 percent blue grama; 20 percent sand dropseed, sideoats grama, and green sprangletop; 15 percent sand muhly, plains bristlegrass, and Hall's panicum; 8 percent other grasses; 3 percent winterfat; 4 percent other shrubs; 2 percent croton; 3 percent other forbs.

Continuous heavy grazing will cause a decrease in plants such as black grama, blue grama, plains bristlegrass, green sprangletop, and winterfat, while grasses such as sand dropseed and perennial threeawn will initially increase. Under further heavy continuous grazing, the dropseeds and most other grasses will decrease while creosotebush will encroach in places.

Limestone Hill Ecological Site. This ecological site in the Dry Mixed Prairie Vegetative Zone includes soil mapping units; the Allamore, moist part of BCE—Beach-

Allamore complex, moist, 5 to 30 percent slopes; the Allamore, moist part of BCG—Allamore-Beach-Rock outcrop complex, moist, 20 to 70 percent slopes; the Bissett, moist part of BRE—Bissett-Rock outcrop complex, moist, 3 to 20 percent slopes; and the Bissett, moist part of BRG—Bissett-Rock outcrop complex, moist, 20 to 65 percent slopes.

This site occurs on gently sloping to very steep hills, ridges, and mountain slopes. Soils are very shallow and shallow, well drained, and are derived from gravelly residuum and colluvium weathered from limestone bedrock. The climax plant community is dominated by mid and shortgrasses with scattered shrubs and forbs.

The climax plant community consists of approximately 25 percent black grama; 24 percent blue grama and sideoats grama; 10 percent curlyleaf muhly; 8 percent hairy grama and Nealley grama; 5 percent wolftail, 5 percent New Mexico feathergrass; 3 percent other grasses; 6 percent sotol, javelinabush, feather dalea; 6 percent other shrubs; 2 percent desert zinnia; 6 percent other forbs.

Continuous heavy grazing will cause a decrease in plants such as black grama, blue grama, plains bristlegrass, range ratany, and winterfat while grasses such as sand dropseed, sideoats grama and perennial threeawn will initially increase. Under further heavy continuous grazing, sand dropseed and sideoats grama and most other grasses will decrease. In some places shrubs such as sotol, lechuguilla, and creosotebush may increase.

Loamy Ecological Site. This ecological site in the Dry Mixed Prairie Vegetative Zone includes soil mapping units; the Kahn, moist part of CWC—Culberspeth-Kahn complex, moist, 1 to 8 percent slopes; RLA—Reyab loam, moist, 0 to 1 percent slopes, occasionally flooded (fig. 23); and the Tenneco, moist part of BED—Beach-Tenneco complex, moist, 3 to 16 percent slopes.

This site occurs on nearly level to moderately steep fan remnants, alluvial flats, alluvial fans, fan piedmonts, and flood plains. Soils are very deep, well drained, and are derived from alluvium. The climax plant community is dominated by mid and shortgrasses with few scattered shrubs and abundant forbs.

The climax plant community consists of approximately 25 percent blue grama; 25 percent tobosa; 20 percent cane bluestem and sideoats grama; 10 percent alkali sacaton and Arizona cottontop; 7 percent vine mesquite and ear muhly; 2 percent burrograss; 6 percent other grasses; 4 percent forbs; and 1 percent shrubs.

Heavy continuous grazing will result in a decrease in blue grama, cane bluestem, vine mesquite, and plains bristlegrass while tobosa, burrograss, and shrubs such as tarbush, cholla will increase.

Sandstone Hill Ecological Site. This ecological site in the Dry Mixed Prairie Vegetative Zone includes soil mapping units; the Beach, moist part of ABG—Allamore-Beach-Rock outcrop complex, moist, 20 to 70 percent slopes; the Beach, moist part of BCE—Beach-Allamore complex, moist, 5 to 30 percent slopes; and the Beach, moist part of BED—Beach-Tenneco complex, moist, 3 to 16 percent slopes.

This site occurs on gently sloping to very steep hills. Soils are very shallow and shallow, well drained, and are derived from gravelly residuum weathered from sandstone. The climax plant community is dominated by mid and shortgrasses with few scattered shrubs and abundant forbs.

The climax plant community consists of approximately 25 percent black grama; 15 percent sideoats grama; 10 percent blue grama; 10 percent Warnock's grama; 10 percent sand dropseed; 5 percent hairy grama; 5 percent New Mexico feathergrass; 5 percent other grasses; 8 percent skeletonleaf goldeneye, winterfat, and cholla; 2 percent other shrubs; and 5 percent forbs.

Heavy continuous grazing will result in a decrease in black grama, blue grama, and winterfat. Grasses such as sideoats grama, hairy grama, and sand dropseed will initially increase. Acacia, yucca, cholla, and other shrubs will increase in places following a loss in herbaceous cover.

Figure 23.—Blue grama, sideoats grama, ear muhly, sand muhly, and cholla on an area of Reyab loam, moist, 0 to 1 percent slopes, occasionally flooded. Reyab moist soils are in the Loamy ecological site, Dry Mixed Prairie vegetative zone.

Mixed Prairie Vegetative Zone

The Mixed Prairie vegetative zone occurs within the highest elevations, about 5,500 to 7,500 feet. Mean annual precipitation ranges from about 16 to 20 inches. This zone is limited to the Sierra Diablo Mountain Range. The climate and soils support a climax vegetation of short and mid grasses with scattered shrubs and trees. The Limestone Hill and Mountain, Mixed Prairie ecological site is the only site occurring in this zone.

Characteristic vegetation includes blue grama, sideoats grama, little bluestem, mesa muhly, New Mexico muhly, New Mexico feathergrass, mountain mahogany, agarito, wavyleaf oak, banana yucca, and Mexican pinyon pine.

Limestone Hill and Mountain Ecological Site. This ecological site in the Mixed Prairie Vegetative Zone includes soil mapping unit; the Yarbam part of YAG—Yarbam-Rock outcrop complex, 35 to 65 percent slopes. (fig. 24)

This site occurs on steep to very steep mountain slopes. Soils are very shallow and shallow, well drained, and developed in residuum weathered from limestone bedrock. The climate and soils support a climax vegetation of short and mid grasses with scattered shrubs and trees.

The climax plant community consists of approximately 30 percent blue grama, curlyleaf muhly, New Mexico muhly, and mesa muhly; 12 percent sideoats grama and little bluestem; 10 percent green sprangletop and cane bluestem; 5 percent New Mexico feathergrass; 8 percent hairy grama, wolftail, Hall's panicum, and perennial threeawn; 5 percent other grasses; 10 percent redberry juniper and wavyleaf oak; 5 percent agarito and mountain mahogany; 5 percent other shrubs; 5 percent Mexican pinyon pine; and 5 percent forbs.

Figure 24.—Blue grama, sideoats grama, curlyleaf muhly, wavyleaf oak, skunkbush sumac, Mexican pinyon pine, banana yucca, cholla, and sotol, on an area of Yarbam-Rock outcrop complex, 35 to 65 percent slopes. Yarbam soils are in the Limestone Hill and Mountain ecological site, Mixed Prairie vegetative zone.

Under continuous heavy grazing, mostly by sheep and goats, palatable plants such as blue grama, New Mexico muhly, little bluestem, green sprangletop, mountain mahogany, and menodora, will decrease while plants such as hairy grama, threeawn, redberry juniper, and yucca will increase. Fire suppression will allow Mexican pinyon pine and other woody plants to increase. Wavyleaf oak resprouts vigorously after a fire.

Recreation

Hunting opportunities are available in many areas of the County. White-tail deer, mule deer, and pronghorn are the major game species. Quail and dove are the major game bird species. There are also opportunities for camping and hiking in Guadalupe Mountains National Park and other areas in the County. Nearby Franklin Mountains State Park and Hueco Tanks State Historic Site have opportunities for hiking, rock climbing, mountain biking, camping and other outdoor activities.

The soils of the survey area are rated in Table 9 and Table 10 according to limitations that affect their suitability for recreation. The ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be

overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.0. 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 9 and Table 10 can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a seasonal high water table, ponding, flooding, and texture of the surface layer.

Golf course fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife

Steve Nelle, Wildlife Biologist, Natural Resources Conservation Service prepared this section

Wildlife is one of the important natural resources in Culberson County. The variety of soils, topography, climate, and vegetation supports an amazing diversity of wildlife. Of the approximately 950 land-dwelling species of wildlife that occur in Texas nearly half of them can be found within the survey area.

Historically, the kinds and numbers of wildlife have changed somewhat since settlement by European man. Species which are no longer present include gray wolf and black footed ferret. Species which may have been more numerous in historic times include bighorn sheep and pronghorn antelope. Desert mule deer may now be more abundant than in historic times because of the increased availability of water.

The conservation and management of wildlife and wildlife habitat are important considerations to most landowners in the area. The basic habitat needs of any wildlife population are food, cover, and water in the right combination and 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 the soils and climate can support. Different ecological sites vary in their ability to meet habitat needs, and can be managed to either harm or 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.

About 80 native species of mammals occur in the survey area. Of these, about 35 kinds of rodents can be found including various species of ground squirrel, prairie dogs, pocket gophers, several species of mouse, kangaroo rat, cotton rat, wood rat, and porcupine. The burrowing and denning activities of most rodents are considered beneficial, enhancing rainfall penetration and the addition of organic matter into the soil. Most rodents eat seeds and foliage, while some consume insects. Rodent numbers fluctuate widely according to rainfall patterns. Their numbers are usually kept in balance

by an abundance of natural predators. Other small mammals include about 15 species of bats and desert shrew.

Three kinds of rabbits occur in the area. The Davis Mountain cottontail is restricted to the higher elevations of the several mountain ranges where it is associated with oak, pinyon, and juniper woodland. The Audubon cottontail lives at lower elevations. Jackrabbits are periodically very abundant in the desert grassland areas. Predators play an important role in helping to keep rabbit numbers in balance. Rabbits also help serve as alternate prey species for coyotes, which may reduce depredation on livestock and game species.

About 14 predatory mammals exist including raccoon, ringtail, several species of skunk, badger, gray fox (fig. 25), desert fox, coyote, bobcat, mountain lion, and a small number of black bear. The beneficial role of predators has been described; however, when predator numbers become excessive, they can have a serious impact upon wildlife and livestock. Trapping and hunting of coyotes and mountain lions is practiced where problems exist, in an effort to reduce the negative impact of these predators.

Native big game mammals that occur include mule deer, pronghorn antelope, bighorn sheep, and javelina. Big game mammals that have been introduced include elk, aoudad sheep, and several other species. Regulated hunting is practiced on these species, and income derived from leasing of hunting rights is an important source of income for many ranches. Management for several of these species is commonly practiced in order to maintain or increase their numbers.

Mule deer are the most abundant big game animal in the area. The highest densities occur in the Sierra Diablo, Wylie, Apache, and Delaware Mountains. Densities here can range from about 50 to 100 acres per deer. Lower densities of 100 to 250 acres per deer occur over much of the desert grassland areas. Very low densities of 300 to 600 acres per deer occur across much of the desert shrub zone, and in areas with poor water distribution.

Figure 25.—A gray fox out looking for prey. Foxes mainly eat small rodents, but are also known to eat fruit, berries, acorns, birds, and eggs.

White-tail deer are rarely seen and probably are strays from the nearby Davis Mountains. White-tail and mule deer sometimes cross and the hybrid offspring have characteristics of both species.

Mule deer (fig. 26) prefer to feed on forbs (broadleaf herbaceous plants), when available. However, because of the lower availability of forbs, deer must utilize browse (leaves and twigs of woody plants) to make up the bulk of their diet. Deer consume very little grass, which provides inadequate nutritional quality. Some of the more important forbs include spurge, bladderpod, croton, menodora, globe mallow, sida, sticky selloa, milkwort, greenthread, broom snakeweed, plantago, hairy tubetongue, fleabane, wild buckwheat, wild mercury, and snoutbean. The more important browse plants include whitethorn acacia, Roemer's acacia, catclaw mimosa, daleas, skeletonleaf goldeneye, apache plume, fourwing saltbush, hackberry, kidneywood, skunkbush sumac, evergreen sumac, littleleaf sumac, mountain mahogany, oaks, juniper, butterfly bush, pricklypear, and lechuguilla. Deer also consume mast (the fruit and flowers of woody plants) when it is available including acorns, mesquite beans, pricklypear fruit, and lechuguilla and yucca stalks and flowers.

Deer require some areas of moderate brush, not only for food, but also for cover, shade, and thermal protection in winter. Thicker areas of grass mixed with 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. Predation by coyotes and mountain lions also keeps populations suppressed across the area.

Resident populations of pronghorn antelope (fig. 27) are scattered across the survey area, primarily in the higher elevation grasslands. Historically, pronghorn antelope occurred across much of the survey area where natural water occurred. Unregulated

Figure 26.—A herd of mule deer. Mule deer need some brush for cover and food.

Figure 27.—A pronghorn antelope in Culberson County, Texas. Pronghorn antelope live mainly in the Dry Mixed Prairie vegetative zone. This species is one of the main big game animals in the County.

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 limited hunting.

Pronghorn 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 considerable browse including many of the species listed above for deer. Like deer, they do not eat much grass, but they do require grass cover to hide fawns from predators. The natural movement of pronghorn is restricted by conventional net wire fences. Where net wire fencing exists, pronghorn need large pastures with access to permanent water and varied topography. Net wire fences can be modified or replaced by barbed wire fencing to allow pronghorn to move to other areas in search of forage and preferred fawning grounds. Pronghorn populations fluctuate in response to rainfall patterns, predator abundance, and other factors which are not yet well understood. Coyote predation is considered a limiting factor in some areas. Grazing management that provides good fawning cover is especially important.

Heavy and continuous yearlong grazing by livestock is detrimental to the habitat of deer and pronghorn. Under these conditions, competition for the preferred food plants exist, limiting the food supply and leading to habitat deterioration. Grazing management that favors deer and pronghorn includes light stocking rates of cattle, and grazing schemes that provide periodic rest.

The absence of permanent water can also seriously limit deer and pronghorn populations. In areas where traditional livestock water developments are not feasible, wildlife water can be provided with rainfall catchment devices commonly known as guzzlers. A number of these guzzlers are present in the survey area.

The javelina occurs scattered throughout the survey area being most abundant in areas of thick brush, especially in canyons. Javelina eat 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 was once common in the mountains of Culberson County. Unregulated market hunting and the construction of the railroad 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 native bighorn sheep is now extinct in Texas. Restoration efforts during the 1950's and 1960’s failed because of poor nutrition, disease, and predation. More recent restoration efforts have been very successful, with stable populations now occurring in the Sierra Diablo, Van Horn, Beach and Baylor Mountains.

Elk populations currently exist in the Sierra Diablo and Wylie Mountains. There is no evidence to suggest that elk were ever native in the survey area although the now extinct Merriam's elk once occurred in the adjacent mountains of northern Mexico.

The aoudad sheep, introduced from northern Africa, has established populations in several mountain ranges. These wild free ranging herds prefer rough, steep terrain and their numbers are difficult to control. As their numbers increase, they compete with deer and bighorn sheep for preferred forbs and browse and contribute to habitat deterioration.

Feral hogs are present in small numbers in the Apache and Delaware Mountains. Landowners generally regard these as undesirable and attempt to control them to the extent possible.

The bird life of Culberson County is also quite diverse. Over 300 species have been recorded. About 100 of these species nest in the survey area. The remainder are either winter residents or species that migrate through.

Each of the bird species has its own unique habitat requirements. Some prefer the oak-juniper woodlands found at higher elevations, while others prefer rugged canyons, desert grasslands, or shrublands.

Birds associated with water are found primarily along the Delaware River. These birds include several kinds of ducks, grebes, coots, herons, egrets, sandpipers, and the belted kingfisher.

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 the young of bighorn sheep, pronghorn, and mule deer, however their main foods include rabbits other small mammals. Turkey vultures and black vultures are the primary carrion eaters. Ravens will eat carrion, insects, rodents, 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 in the survey area. Both the mourning dove and white-winged dove occur. Small and scattered populations of turkey can be found, where nesting cover, water, and roost areas are present. The three kinds of quail are the scaled quail, Gambel's quail, and Mearn's quail. The Mearn's quail are limited to higher elevations of the Sierra Diablo Mountains, where they inhabit oak-juniper-pinyon woodlands. There is no open season on Mearn's quail. Gambel's quail are found primarily in brushy draws, mostly at lower elevations. Scaled quail are the most numerous and are commonly found throughout the area except in the higher mountain elevations.

Scaled quail generally 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 ideally consists of large clumps of grass left ungrazed from the previous year. Quail will also nest in or near pricklypear, yucca, and other spiny shrubs. 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 scaled quail food plants in the survey area include cowpen daisy, pigweed, croton, spurge, broom snakeweed, menodora, buffalobur, Hall's panicum, plains bristlegrass, mesquite, whitethorn acacia, tasajillo, wolfberry, hackberry, 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 may survive better when water is available.

Amphibians, including several species of frogs and toads and the tiger salamander, are restricted to wet or seasonally wet areas such as creeks, seeps, 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 (fig. 28) occur including the earless, collared, horned, 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 (fig. 29), coach whip, bullsnake, water snake, patchnose snake, blackhead snake, ringneck snake, and garter

Figure 28.—A close-up of a Texas Horny Toad. Horny toads chiefly feed on ants, but are also known to consume beetles and grasshoppers. They burrow in the topsoil to hide themselves.

Figure 29.—Over thirty species of snakes are found in Culberson County, Texas. This milk snake consumes rodents, birds, lizards, and eggs. They kill their prey by constriction.

snake. Venomous snakes include the following five species of rattlesnakes: western diamondback, Mojave, mottled rock, blacktail, and prairie.

The water resources that are inhabited by fish are largely limited to the Delaware River. A few permanent ponds occur and are stocked with bass, catfish, and forage species.

Wildlife are a valuable part of the natural resources in the survey area. Wildlife have 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 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.

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 11 and Table 12 show the degree and kind of soil limitations that affect various kinds of habitat for wildlife. The tables show limitations of the soils for desertic herbaceous plants; habitat for burrowing mammals and reptiles; desertic shrubs and trees; riparian herbaceous plants; and riparian shrubs, vines, and trees. 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 creosotebush, lechuguilla, ocotillo, whitethorn acacia, and 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, a high content of organic matter, and high concentrations of rock fragments. Examples of burrowing mammals and reptiles are prairie dogs, gophers, badgers, lizards, rattlesnakes, and bull snakes.

Ratings for *desertic shrubs and trees* indicate the limitation of the soils as a growing medium for a diverse upland herbaceous plant community. This community is adapted to soils in an arid or semiarid environment that is drier than that common in moist riparian and wetland zones and in subhumid, humid, or tropical areas. The soil properties and features that affect the ability of these species to thrive include soil texture, available water capacity, depth to a high water table, the presence of excess salts in the soil, soil reaction (pH), soil moisture and temperature regimes and rock fragments on the soil surface. Examples of desertic shrubs and trees are creosotebush, tarbush, fourwing saltbush, western honey mesquite, catclaw acacia, and redberry juniper.

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 giant sacaton, alkali sacaton, whiplash pappusgrass, 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 cottonwood, western soapberry, burrobrush, baccharis, and desert willow.

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; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). 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, 1998).

For information regarding hydric soils in the soil survey area, refer to the USDA Natural Resources Conservation Service Soil Data Mart at http://soildatamart.nrcs.usda.gov.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

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

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

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

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 13 and Table 14 show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.0. 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 15 and Table 16 show 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 17 and Table 18 provide 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 17, 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 19 provides information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.0. 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 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. The underlying material is not rated and should be evaluated during an onsite investigation. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

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

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

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

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 mineralogy.

Engineering Properties

Table 20 provides the engineering classifications and the range of engineering 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 21 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 22, 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 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 1/10bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

*Permeability (*K-sat*)* refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K-sat). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per

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

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10bar 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 21, 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 21 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 22 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 23 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 24 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 24 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 24 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, Chemical, Mineralogy, Grain Count, and Engineering Index Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are shown in table 25, and the results of chemical analysis in table 26. Table 27 shows the mineralogy of selected soils. Table 28 shows optical grain counts for selected soils. Table 29 summarizes some engineering index properties from selected soils. 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 at Lincoln, Nebraska; Texas A&M University Soil Characterization Laboratory at College Station, Texas; and Texas Tech University Soil Characterization Laboratory at 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 NRCS, 1996).

Sand—(0.05- to 2.0-millimeter fraction) weight percentages of material less than 2 millimeters (3A1).

Silt—(0.002- to 0.05-millimeter fraction) pipette extraction, weight percentages of all material less than 2 millimeters (3A1).

Clay—(fraction less than 0.002 millimeters) pipette extraction, weight percentages of material less than 2 millimeters (3A1).

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).

Carbon to Nitrogen ratio, calculation.

Reaction (pH)—1:1 water dilution (4C1a2a1).

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).

Calcium Carbonate Equivalent, <2mm. (4e1a1a1a1a).

Gypsum, H2O Extraction, Acetone Precipitation, <2mm. (4e2a1a1a1).

Electrical conductivity—saturation extract (4F2b1).

X-ray Diffraction, Thin Film on Glass, Resin Pretreatment II. (7A2i)

Optical Analysis, Full Grain Count. (7B1a2)

Engineering Index Properties. (1B1a, 2A1, 2B)

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 30 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 Torrert (Torr, meaning hot and dry, 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 Haplotorrerts (Hapl, meaning minimal horizonation, plus torrerts, the suborder of the Vertisols that has a torric soil 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 Haplotorrerts.

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 Haplotorrerts.

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. An example is Verhalen.

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 Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 2003). Unless otherwise indicated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

Aguena Series

Map unit(s): AAD, KPB
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Dunes
Parent material: Eolian sands derived from mixed sources
Elevation: 4,000 to 5,500 feet
Slope: 1 to 10 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Mixed, thermic Ustic Torripsamments

Typical Pedon

Aguena loamy fine sand in an area of map unit KPB—Kinco-Aguena-Perilla complex, 1 to 5 percent slopes; Plateau, Texas USGS topographic quadrangle; Latitude 31 degrees, 05 minutes, 29.56 seconds North and Longitude 104 degrees, 35 minutes, 29.32 seconds West; UTM Easting: 538963 meters; UTM Northing: 3439819 meters; UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 4 inches; strong brown (7.5YR 5/8) loamy fine sand, dark brown (7.5YR 3/4) moist; single grain; loose, loose, nonsticky, nonplastic; common very fine and common fine roots; noneffervescent; slightly alkaline; clear smooth boundary.

C1—4 to 47 inches; strong brown (7.5YR 4/6) loamy fine sand, dark brown (7.5YR 3/4) moist; single grain; loose, loose, nonsticky, nonplastic; common very fine, common fine, and common medium roots; noneffervescent; moderately alkaline; clear smooth boundary.

C2—47 to 80 inches; strong brown (7.5YR 4/6) loamy fine sand, dark brown (7.5YR 3/4) moist; single grain; loose, loose, nonsticky, nonplastic; 2 percent very fine faint irregular carbonate masses with diffuse boundaries in matrix; strongly effervescent; moderately alkaline.

Range in Characteristics

Particle-size control section (weighted average):
Clay content: 2 to 8 percent
Calcium carbonate equivalent: 0 to 5 percent

A horizon

Hue: 7.5YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 4 to 8, dry or moist
Texture: Fine sand or loamy fine sand
Reaction: Slightly alkaline or moderately alkaline

C horizon

Hue: 7.5YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 4 to 6, dry or moist
Texture: Fine sand or loamy fine sand
Reaction: Slightly alkaline or moderately alkaline

Allamore Series

Map unit(s): ABE, ABG, BCE, BCG
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Hills
Parent material: Gravelly residuum weathered from sandstone
Elevation: 4,000 to 5,500 feet
Slope: 5 to 70 percent
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 60 to 67 degrees F
Frost-free period: 200 to 250 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplocalcids

Typical Pedon

Allamore very gravelly loam in an area of map unit BCG—Beach-Allamore-Rock outcrop complex, 20 to 70 percent slopes; Hudspeth County, Sheep Peak, Texas USGS topographic quadrangle; Latitude: 31 degrees, 8 minutes, 4.00 seconds North and Longitude: 104 degrees, 58 minutes, 34.77 seconds West. UTM Easting: 502257 meters, UTM Northing: 3444502 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 4 inches; reddish brown (5YR 4/3) very gravelly loam, reddish brown (5YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; common fine and common medium roots; 37 percent subrounded very strongly cemented sandstone gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk—4 to 11 inches; reddish brown (5YR 4/3) extremely gravelly fine sandy loam, reddish brown (5YR 4/3) moist; moderate medium subangular blocky structure, and weak fine subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; common fine and common medium roots; 40 percent carbonate coats on rock fragments; 10 percent distinct weakly cemented carbonate masses with clear boundaries around rock fragments and carbonate, finely disseminated; 65 percent subrounded very strongly cemented sandstone gravel; violently effervescence; moderately alkaline; very abrupt smooth boundary.

R—11 to 21 inches; indurated sandstone bedrock.

Range in Characteristics

Depth to lithic contact: 8 to 20 inches
Particle-size control section (weighted average):
Clay content: 10 to 27 percent

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, sandy loam, or loam
Rock fragments: 35 to 60 percent with 5 to 40 percent gravel, 5 to 19 percent cobbles
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 5YR to 10YR
Value: 4 to 8 dry, 4 to 7 moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, sandy loam, or loam
Rock fragments: 35 to 60 percent with 5 to 40 percent gravel, 5 to 19 percent cobbles
Calcium carbonate equivalent: 15 to 30 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

R layer

Bedrock kind: Sandstone bedrock

Antbed Series

Map unit(s): ANB
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Alluvial flats
Parent material: Loamy alluvium derived from igneous rock
Elevation: 4,000 to 5,500 feet
Slope: 0 to 3 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine, mixed, superactive, thermic Ustic Haplargids

Typical Pedon

Antbed loam in an area of map unit ANB—Antbed loam, 0 to 3 percent slopes; Plateau, Texas USGS topographic quadrangle; Latitude: 31 degrees, 1 minute, 40 seconds North and Longitude: 104 degrees, 34 minutes, 34 seconds West; UTM Easting: 540447 meters, UTM Northing: 3432771 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Ap—0 to 4 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; moderately hard, friable, moderately sticky, moderately plastic; strongly effervescence; neutral; clear smooth boundary.

Bt—4 to 17 inches; strong brown (7.5YR 4/6) clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; moderately hard, friable, moderately sticky, very plastic; 25 percent distinct clay films on all faces of peds; slightly effervescence; slightly alkaline; clear smooth boundary.

Btk1—17 to 41 inches; light brown (7.5YR 6/4) clay, brown (7.5YR 5/4) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; hard, firm, very sticky, very plastic; 25 percent distinct clay films on all faces of peds; 4 percent medium distinct carbonate masses with clear boundaries in cracks; strongly effervescence; moderately alkaline; clear smooth boundary.

Btk2—41 to 80 inches; light brown (7.5YR 6/4), clay loam, brown (7.5YR 5/4) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; hard, firm, very sticky, very plastic; 20 percent distinct clay films on all faces of

peds; 2 percent medium distinct carbonate masses with clear boundaries in cracks; strongly effervescence; moderately alkaline.

Range in Characteristics

Depth to argillic horizon: 4 to 10 inches

A or Ap horizons

Hue: 5YR to 10YR
Value: 4 to 6 dry, 3 or 4 moist
Chroma: 3 or 4 dry, 3 to 6 moist
Texture: Loam, sandy clay loam, silty clay loam, clay loam, silty clay, or clay
Clay content: 20 to 42 percent
Calcium carbonate equivalent: 0 to 5 percent
Effervescence: Slightly or strongly
Reaction: Neutral to slightly alkaline

Bt horizon

Hue: 2.5YR to 7.5YR
Value: 4 or 5, dry or moist
Chroma: 3 to 6, dry or moist
Texture: Silty clay loam, clay loam, silty clay, or clay
Clay content: 27 to 50 percent
Calcium carbonate equivalent: 0 to 5 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Btk horizon

Hue: 5YR or 7.5YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 4 to 6, dry or moist
Texture: Silty clay loam, clay loam, silty clay, or clay
Clay content: 28 to 55 percent
Rock fragments: 0 to 5 percent
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Slightly or strongly
Reaction: Moderately alkaline

Bk horizon (where present)

Hue: 5YR or 7.5YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 4 to 6 dry, 4 moist
Texture: Silty clay or clay
Clay content: 40 to 56 percent
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Slightly to violently
Reaction: Moderately alkaline

Beach Series

Map unit(s): ABE, ABG, BBC, BBD, BCE, BCG, BED, BHE, BSG
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Hills, Low hills

Parent material: Gravelly residuum weathered from sandstone
Elevation: 4,000 to 5,500 feet
Slope: 3 to 70 percent
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 60 to 67 degrees F
Frost-free period: 200 to 250 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents

Typical Pedon

Beach very cobbly sandy loam in an area of map unit ABE—Allamore-Beach-Rock outcrop complex, 5 to 30 percent slopes; Hudspeth County, Hackett Peak, Texas USGS topographic quadrangle; Latitude: 31 degrees, 7 minutes, 7.10 seconds North and Longitude: 104 degrees, 56 minutes, 48.75 seconds West. UTM Easting: 505065 meters, UTM Northing: 3442751 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 9 inches; brown (7.5YR 5/4), very cobbly sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky, nonplastic; common medium roots between peds and common fine roots; common fine moderate continuity irregular pores; 5 percent subangular indurated sandstone stones, 15 percent subangular indurated sandstone gravel, and 30 percent subangular indurated sandstone cobbles; strongly effervescence; neutral; clear wavy boundary.
R—9 to 19 inches; indurated sandstone bedrock.

Range in Characteristics

Depth to lithic contact: 4 to 13 inches
Particle-size control section (weighted average):
Clay content: 13 to 25 percent
Rock fragments: 35 to 64 percent with 10 to 20 percent gravel, 25 to 35 percent cobbles, 0 to 9 percent stones

A horizon

Hue: 5YR to 10YR
Value: 3 to 7, dry or moist
Chroma: 2 to 6 dry, 2 to 4 moist
Texture: Coarse sandy loam, sandy loam, fine sandy loam, loam, or silt loam
Calcium carbonate equivalent: 0 to 5 percent
Effervescence: Slightly or strongly
Reaction: Neutral to moderately alkaline

R layer

Bedrock kind: Sandstone bedrock

Bissett Series

Map unit(s): BHE, BID, BIE, BIG, BRE, BRG, BSG
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Hills, ridges, mountain slopes
Parent material: Gravelly colluvium derived from limestone over gravelly residuum weathered from limestone

Elevation: 4,000 to 5,500 feet
Slope: 3 to 70 percent
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 60 to 67 degrees F
Frost-free period: 200 to 250 days

Taxonomic Class

Loamy-skeletal, carbonatic, thermic Lithic Ustic Haplocalcids

Typical Pedon

Bissett very cobbly loam (fig. 30) in an area of map unit BIE—Bissett-Rock outcrop complex, 10 to 30 percent slopes; Dome Hill, Texas USGS topographic quadrangle; Latitude: 31 degrees, 16 minutes, 28.06 seconds North and Longitude: 104 degrees, 26 minutes, 18.65 seconds West. UTM Easting: 553449 meters, UTM Northing: 3460156 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 2 inches; brown (10YR 5/3), very cobbly loam, brown (10YR 4/3) moist; weak fine granular structure; slightly hard, friable; common very fine roots around fragments, common fine, medium, and coarse roots; 5 percent fine prominent carbonate nodules; 5 percent indurated cemented carbonate concretions around rock fragments; 25 percent subangular indurated limestone cobbles, and 30 percent subangular indurated limestone gravel; strongly effervescence; moderately alkaline; clear smooth boundary.

Bk—2 to 9 inches; pale brown (10YR 6/3), very cobbly loam, yellowish brown (10YR 5/4) moist; weak fine and medium granular structure; slightly hard, friable; common very fine and fine roots at top of horizon; 5 percent fine platy indurated cemented carbonate laminae with sharp boundaries at top of horizon; 25 percent subangular indurated limestone cobbles, and 30 percent subangular indurated limestone gravel; strongly effervescence; moderately alkaline; very abrupt wavy boundary.

R—9 to 19 inches; indurated limestone bedrock

Range in Characteristics

Depth to calcic horizon: 0 to 10 inches
Depth to lithic contact: 6 to 20 inches
Particle-size control section (weighted average):
  Clay content: 25 to 35 percent
  Calcium carbonate equivalent: 40 to 60 percent

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 3 to 4, dry or moist
Texture: Silt loam or loam
Rock fragments: 35 to 60 percent with 15 to 40 percent gravel, 0 to 26 percent cobbles
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 3 or 4, dry or moist
Texture: Silt loam or loam
Rock fragments: 35 to 60 percent with 15 to 40 percent gravel, 0 to 26 percent cobbles
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Figure 30.—Profile of Bissett very cobbly loam in an area of Bissett-Rock outcrop complex, 10 to 30 percent slopes. Bissett soils contain more than 35 percent coarse fragments, and are very shallow and shallow soils over limestone. (Scale in centimeters)

R layer

Bedrock kind: Limestone bedrock

Bofecillos Series

Map unit(s): BVC, BVE, HRC
Depth class: Very shallow
Drainage class: Well drained
Slowest soil permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Hills, Low hills
Parent material: Skeletal residuum weathered from basalt and/or skeletal colluvium derived from basalt
Elevation: 4,000 to 5,500 feet
Slope: 1 to 30 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents

Typical Pedon

Bofecillos very gravelly sandy loam in an area of map unit HRC—Horsetrap-Bofecillos complex, 1 to 8 percent slopes; Chispa Mountain NW, Texas USGS topographic quadrangle; Latitude: 30 degrees, 54 minutes, 35.98 seconds North and Longitude: 104 degrees, 38 minutes, 14.81 seconds West. UTM Easting: 534644 meters; UTM Northing: 3419683 meters; UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 9 inches; dark yellowish brown (10YR 4/4) very gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable, slightly sticky, slightly plastic; many very fine roots; 5 percent distinct carbonate coats on rock fragments; carbonate, finely disseminated; 45 percent subrounded indurated igneous gravel; slightly effervescence; slightly alkaline; very abrupt smooth boundary.

R—9 to 19 inches; indurated basalt bedrock.

Range in Characteristics

Depth to lithic contact: 4 to 10 inches
Organic carbon: Less than 2 percent
Calcium carbonate equivalent: 0 to 2 percent
Rock fragments: 35 to 75 percent with 35 to 65 percent gravel, 0 to 10 percent cobbles
Reaction: Neutral to moderately alkaline
Particle-size control section (weighted average):
Clay content: 18 to 25 percent

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 2 to 4, moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, loam, or sandy clay loam
Effervescence: Slightly or strongly

R layer

Bedrock kind: Basalt bedrock

Changas Series

Map unit(s): CCE
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.001 to 0.06 in/hr (very slow)
Landform: Erosional fan remnants
Parent material: Gypsiferous clayey lacustrine deposits
Elevation: 3,000 to 4,000 feet
Slope: 5 to 30 percent
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Taxonomic Class

Fine, smectitic, hyperthermic Leptic Haplogypsids

Typical Pedon

Changas sandy clay loam in an area of map unit CCE—Changas-Corazones complex, 1 to 30 percent slopes; Hudspeth County, Neely Canyon, Texas USGS topographic quadrangle; Latitude: 31 degrees, 5 minutes, 54.26 seconds North and Longitude: 105 degrees, 35 minutes, 21.30 seconds West. UTM Easting: 443804 meters, UTM Northing: 3440657 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 4 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, very sticky, very plastic; violently effervescence; slightly alkaline; clear smooth boundary.

By1—4 to 15 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, very sticky, very plastic; 3 percent fine weakly cemented gypsum masses; violently effervescence; slightly alkaline; clear smooth boundary.

By2—15 to 25 inches; brown (10YR 4/3) clay, brown (10YR 4/3) moist; moderate fine and medium angular blocky structure; very hard, very firm, very sticky, very plastic; 10 percent fine weakly cemented gypsum masses; violently effervescence; slightly alkaline; clear smooth boundary.

By3—25 to 80 inches; pale brown (10YR 6/3) clay, brown (10YR 5/3) moist; moderate fine subangular blocky structure; hard, firm, very sticky, very plastic; 8 percent fine weakly cemented gypsum masses; violently effervescence; slightly alkaline.

Range in Characteristics

Depth to gypsic horizon: 2 to 7 inches
Particle-size control section (weighted average):
Clay content: 40 to 55 percent
Rock fragments: 0 to 20 percent gravel

A horizon

Hue: 5YR to 10YR
Value: 4 to 6 dry, 4 to 5 moist
Chroma: 3 to 4, dry or moist
Texture: Sandy clay loam, silty clay loam, silty clay, or clay
Clay content: 25 to 50 percent
Calcium carbonate equivalent: 5 to 15 percent
Gypsum content: 1 to 5 percent
EC (mmhos/cm): 0 to 2
SAR: 0 to 10
Effervescence: Strongly or violently
Reaction: Neutral to moderately alkaline

By horizon

Hue: 5YR to 10YR
Value: 4 to 7 dry, 4 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: Silty clay or clay
Clay content: 40 to 60 percent
Calcium carbonate equivalent: 5 to 15 percent
Gypsum content: 2 to 15 percent
EC (dS/m): 4 to 8
SAR: 5 to 25
Effervescence: Strongly or violently
Reaction: Neutral to moderately alkaline

Chilicotal Series

Map unit(s): CHC, COC, CVC
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Fan remnants
Parent material: Fan gravelly alluvium derived from igneous rock and/or gravelly pedisediment derived from limestone
Elevation: 4,000 to 5,500 feet
Slope: 1 to 8 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Ustic Haplocalcids

Typical Pedon

Chilicotal loam (fig. 31) in an area of map unit CVC—Culberspeth-Chilicotal complex, 1 to 8 percent slopes; Hudspeth County, Sierra Blanca SW, Texas USGS topographic quadrangle; Latitude: 31 degrees, 3 minutes, 8.80 seconds North and Longitude: 105 degrees, 22 minutes, 45.49 seconds West. UTM Easting: 463809 meters, UTM Northing: 3435476 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 3 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; 10 percent subangular indurated limestone gravel; violently effervescence; moderately alkaline; clear smooth boundary.

Bw—3 to 12 inches; brown (10YR 5/3) gravelly loam, brown (10YR 4/3) moist; weak very fine subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; 18 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline; clear smooth boundary.

Bk1—12 to 22 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; slightly hard, friable, moderately sticky, moderately plastic; 5 percent moderately cemented carbonate masses around rock fragments; 24 percent subangular indurated limestone gravel; violently effervescence; moderately alkaline; clear smooth boundary.

Bk2—22 to 80 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; 10 percent moderately cemented carbonate masses around rock fragments; 70 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline.

Range in Characteristics

Depth to calcic horizon: 6 to 20 inches
Particle-size control section (weighted average):
Clay content: 18 to 30 percent

A or Bw horizons

Hue: 7.5YR or 10YR
Value: 4 to 8 dry, 3 to 6 moist
Chroma: 2 to 6, dry or moist
Texture: Sandy loam, fine sandy loam, loam

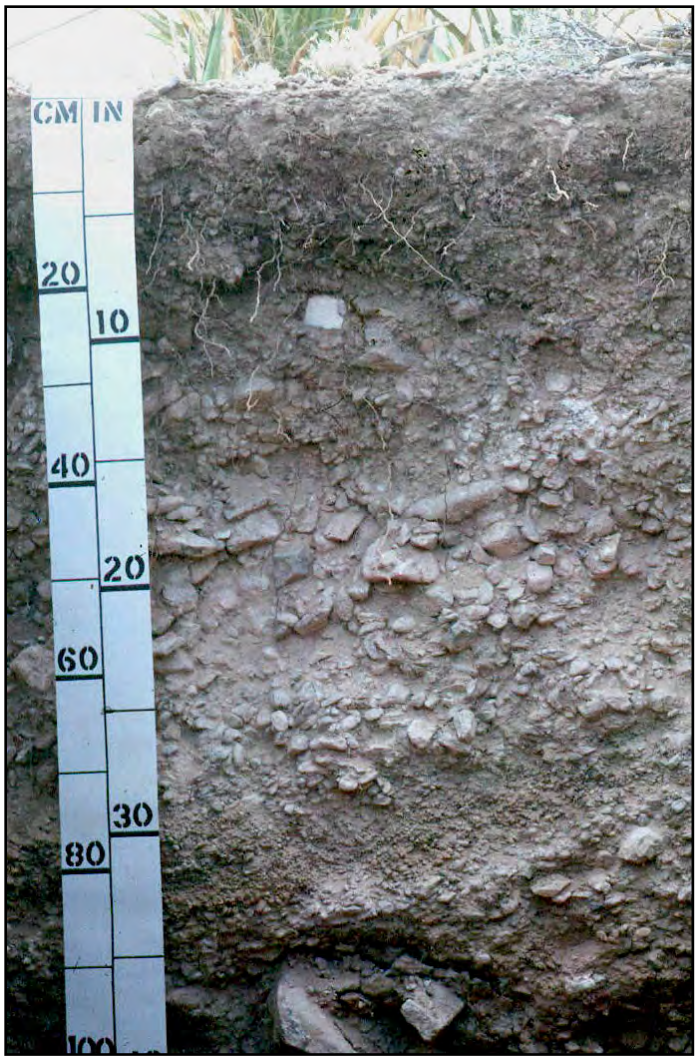

Figure 31.—Chilicotal loam in an area of Culberspeth-Chilicotal complex, 1 to 8 percent slopes. Rock fragments comprise more than 35 percent of the 10- to 40-inch control section. (Scale in CM—centimeters, IN—inches)

Rock fragments: 5 to 60 percent with 5 to 55 percent gravel, 0 to 10 percent cobbles
Calcium carbonate equivalent: 5 to 25 percent
Effervescence: Strongly or violently
Reaction: 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, sandy clay loam, clay loam
Rock fragments: 10 to 75 percent with 20 to 60 percent gravel, 0 to 10 percent cobbles
Calcium carbonate equivalent: 20 to 35 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Chillon Series

Map unit(s): CIB
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Stream terraces
Parent material: Gravelly alluvium derived from igneous and sedimentary rock
Elevation: 3,000 to 4,000 feet
Slope: 1 to 3 percent
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, hyperthermic Ustic Haplocambids

Typical Pedon

Chillon extremely gravelly sandy loam in an area of map unit CIB—Chillon extremely gravelly sandy loam, 1 to 3 percent slopes; Hudspeth County, Schroder Arroyo OE S, Texas USGS topographic quadrangle; Latitude: 30 degrees, 51 minutes, 46.69 seconds North and Longitude: 105 degrees, 22 minutes, 52.21 seconds West. UTM Easting: 463559 meters, UTM Northing: 3414478 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 7 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak fine granular structure; soft, very friable, nonsticky, nonplastic; 23 percent subrounded indurated mixed rock cobbles and 54 percent subrounded indurated mixed rock gravel; strongly effervescence; slightly alkaline; clear wavy boundary.

Bk—7 to 20 inches; very pale brown (10YR 7/3) extremely gravelly coarse sandy loam, pale brown (10YR 6/3) moist; weak fine granular structure; soft, very friable, nonsticky, nonplastic; 4 percent extremely weakly cemented carbonate masses around rock fragments; 22 percent subrounded indurated mixed rock cobbles and 58 percent subrounded indurated mixed rock gravel; strongly effervescence; moderately alkaline; gradual wavy boundary.

BC—20 to 36 inches; very pale brown (10YR 8/4) extremely gravelly loamy coarse sand, very pale brown (10YR 7/4) moist; single grain; loose, loose, nonsticky, nonplastic; 3 percent extremely weakly cemented carbonate masses around rock fragments; 25 percent subrounded indurated mixed rock cobbles and 50 percent subrounded indurated mixed rock gravel; violently effervescence; moderately alkaline; clear wavy boundary.

C—36 to 80 inches; pink (7.5YR 8/4) extremely cobbly coarse sandy loam, pink (7.5YR 7/4) moist; single grain; loose, loose, nonsticky, nonplastic; 30 percent subrounded indurated mixed rock gravel and 40 percent subrounded indurated mixed rock cobbles; violently effervescence; moderately alkaline.

Range in Characteristics

Depth to cambic horizon: 4 to 10 inches
Calcium carbonate equivalent: 0 to 5 percent
Particle-size control section (weighted average):
Rock fragments: 35 to 80 percent, with 30 to 55 percent gravel, 5 to 40 percent cobbles

A horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 3 or 4, dry or moist
Texture: Sandy loam or loam
Clay content: 12 to 18 percent
Effervescence: Slightly or strongly
Reaction: Neutral to moderately alkaline

Bk or Bw horizons

Hue: 5YR to 10YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 3 to 4 dry or moist
Texture: Loamy sand, coarse sandy loam, sandy loam, or loam
Clay content: 5 to 18 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

BC or C horizons

Hue: 7.5YR or 10YR
Value: 4 to 8 dry, 3 to 7 moist
Chroma: 3 to 6, dry or moist
Texture: Loamy coarse sand, loamy sand, coarse sandy loam, sandy loam, loam, or sandy clay loam
Clay content: 5 to 30 percent
Effervescence: Slightly to violently
Reaction: Slightly alkaline or moderately alkaline

Chipotle Series

Map unit(s): CLA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Arroyos
Parent material: Gravelly alluvium
Elevation: 4,000 to 5,500 feet
Slope: 0 to 2 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Sandy-skeletal, mixed, thermic Ustic Torrifluvents

Typical Pedon

Chipotle extremely gravelly loamy sand in an area of map unit CLA—Chipotle-Riverwash complex, 0 to 2 percent slopes, frequently flooded; Hudspeth County, Lobo SW, Texas USGS topographic quadrangle; Latitude: 30 degrees, 49 minutes, 37.69 seconds North and Longitude: 104 degrees, 58 minutes, 30.61 seconds West. UTM Easting: 502375 meters, UTM Northing: 3410445 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 7 inches; reddish brown (5YR 5/3) extremely gravelly loamy sand, reddish brown (5YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky, nonplastic; 5 percent subrounded indurated limestone cobbles, 15 percent subrounded indurated sandstone gravel, and 45 percent subrounded indurated limestone gravel; very slightly effervescence; slightly acid; abrupt wavy boundary.

C1—7 to 16 inches; reddish brown (5YR 5/3) extremely gravelly sand, reddish brown (5YR 4/3) moist; loose, loose, nonsticky, nonplastic; 5 percent subrounded indurated limestone cobbles, 5 percent subrounded indurated sandstone gravel, and 55 percent subrounded indurated limestone gravel; slightly acid; abrupt wavy boundary.

C2—16 to 60 inches; reddish brown (5YR 5/3) extremely gravelly loamy sand, reddish brown (5YR 4/3) moist; soft, very friable, nonsticky, nonplastic; 5 percent subrounded indurated sandstone gravel and 65 percent subrounded indurated limestone gravel; slightly effervescence; neutral; abrupt wavy boundary.

C3—60 to 80 inches; reddish brown (5YR 5/3) extremely gravelly loamy sand, reddish brown (5YR 4/3) moist; soft, very friable, nonsticky, nonplastic; 5 percent subrounded indurated sandstone gravel and 60 percent subrounded indurated limestone gravel; neutral.

Range in Characteristics

Calcium carbonate equivalent: 0 to 1 percent
Particle-size control section (weighted average):
Clay content: 2 to 10 percent

A horizon

Hue: 5YR to 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sand, sand, loamy sand, or loamy coarse sand
Rock fragments: 35 to 75 percent with 30 to 50 percent gravel, 0 to 25 percent cobbles
Reaction: Slightly acid

C horizon

Hue: 5YR to 7.5YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Coarse sand, sand, loamy sand, or loamy coarse sand
Rock fragments: 35 to 75 percent with 30 to 60 percent gravel, 0 to 15 percent cobbles
Reaction: Slightly acid to neutral

Chispa Series

Map unit(s): COC, CPC
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Alluvial fans, fan remnants
Parent material: Loamy alluvium derived from mixed sources
Elevation: 4,000 to 5,500 feet
Slope: 0 to 5 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Ustic Haplocalcids

Typical Pedon

Chispa sandy loam in an area of map unit CPC—Chispa-Tenneco complex, 0 to 8 percent slopes; Hudspeth County, Gunsight Hills South, Texas USGS topographic quadrangle; Latitude: 31 degrees, 22 minutes, 17.74 seconds North and Longitude: 105 degrees, 25 minutes, 49.45 seconds West. UTM Easting: 459071 meters, UTM Northing: 3470865 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 6 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; 5 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline; clear smooth boundary.

Bw—6 to 16 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky, moderately plastic; 5 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline; clear smooth boundary.

Bk1—16 to 23 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky, moderately plastic; 10 percent medium carbonate concretions; 5 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline; clear smooth boundary.

Bk2—23 to 80 inches; very pale brown (10YR 7/4) clay loam, light yellowish brown (10YR 6/4) moist; slightly hard, friable, moderately sticky, moderately plastic; 20 percent fine distinct carbonate masses with clear boundaries; 3 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline.

Range in Characteristics

Depth to calcic horizon: 10 to 20 inches
Reaction: Moderately alkaline
Particle-size control section (weighted average):
Clay content: 20 to 35 percent
Rock fragments: 0 to 15 percent gravel

A horizon

Hue: 5YR to 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Fine sandy loam, sandy loam, loam, or sandy clay loam
Calcium carbonate equivalent: 2 to 5 percent
Organic matter: 1 to 2 percent
Effervescence: Strongly or violently

Bw horizon

Hue: 5YR to 10YR
Value: 4 to 7, dry or moist
Chroma: 2 to 6, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Calcium carbonate equivalent: 2 to 10 percent
Effervescence: Strongly or violently

Bk horizon

Hue: 5YR to 10YR
Value: 4 to 7, dry or moist
Chroma: 3 to 6, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Calcium carbonate equivalent: 15 to 35 percent
Effervescence: Strongly or violently

Corazones Series

Map unit(s): CCE, OCB, OCF
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Fan remnants
Parent material: Gravelly alluvium derived from mixed sources
Elevation: 3,000 to 4,000 feet
Slope: 1 to 40 percent
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, hyperthermic Ustic Haplocalcids

Typical Pedon

Corazones very gravelly fine sandy loam (fig. 32) in an area of map unit OCB—Ojinaga-Corazones complex, 1 to 5 percent slopes; Hudspeth County, USGS Neely Canyon, Texas topographic quadrangle; Latitude 31 degrees, 2 minutes, 18.10 seconds North and Longitude 105 degrees, 31 minutes, 4.80 seconds West. UTM Easting: 450568 meters, UTM Northing: 3439819 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 3 inches; very pale brown (10YR 7/3) very gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; weak medium platy structure, and weak fine subangular blocky structure, and weak medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; vesicular pores; 40 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline; clear smooth boundary.

Bk1—3 to 11 inches; very pale brown (10YR 7/3) extremely gravelly fine sandy loam, light yellowish brown (10YR 6/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 20 percent prominent white (10YR 8/1), dry, carbonate coats on rock fragments; 5 percent moderately cemented white (10YR 8/1) carbonate masses on bottom of rock fragments; 5 percent subrounded indurated limestone cobbles and 60 percent subangular indurated limestone gravel; violently effervescence; moderately alkaline; abrupt smooth boundary.

Bk2—11 to 80 inches; very pale brown (10YR 7/3) extremely gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; 40 percent prominent white (10YR 8/1), dry, carbonate coats on rock fragments; 9 percent subrounded indurated limestone cobbles and 60 percent subangular indurated limestone gravel; violently effervescence; moderately alkaline.

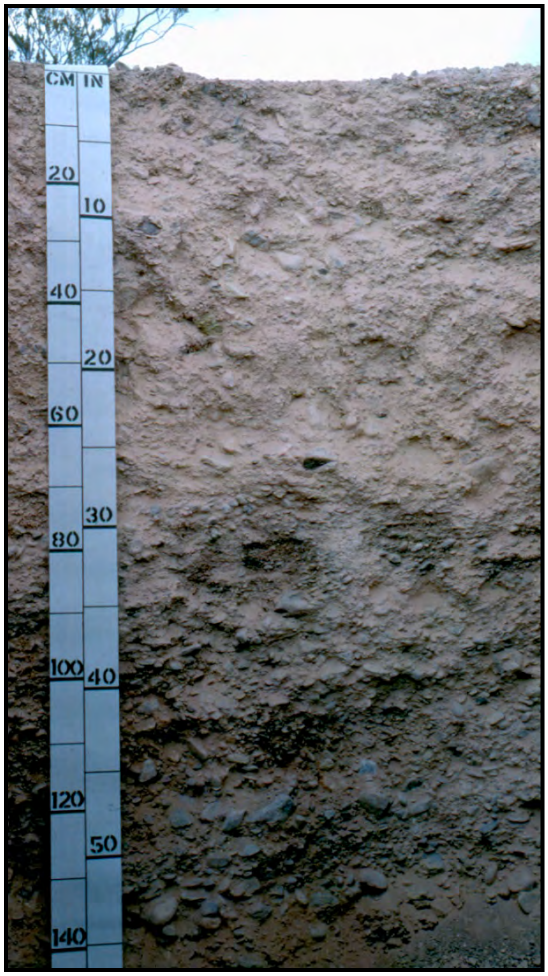

Figure 32.—Profile of Corazones very gravelly fine sandy loam in an area of Ojinaga-Corazones complex, 1 to 5 percent slopes. Corazones soils formed in gravelly alluvium, and are on fan remnants. The gravels are readily observable at a depth of 30 inches (76 cm). (Scale in CM-centimeters, IN-inches)

Range in Characteristics

Depth to calcic horizon: 4 to 25 inches
Reaction: Moderately alkaline
Particle-size control section (weighted average):
Clay content: 15 to 30 percent

A 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 75 percent with 30 to 65 percent gravel, 0 to 10 percent cobbles
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Strongly or violently

Bw horizon (where present)

Hue: 7.5YR or 10YR
Value: 5 to 7, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam or loam
Rock fragments: 35 to 75 percent with 30 to 65 percent gravel, 5 to 10 percent cobbles
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Strongly or violently

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 8, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sandy loam, sandy loam, fine sandy loam, loam, or sandy clay loam
Rock fragments: 35 to 75 percent with 30 to 65 percent gravel, 5 to 10 percent cobbles
Calcium carbonate equivalent: 15 to 30 percent
Effervescence: Strongly or violently

Corvus Series

Map unit(s): CTC, YLA
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Relict stabilized gypsum dunes, alluvial flats
Parent material: Gypsiferous eolian deposits
Elevation: 3,000 to 4,000 feet
Slope: 0 to 5 percent
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Taxonomic Class

Coarse-gypseous, hypergypsic, thermic, shallow Typic Petrogypsids

Typical Pedon

Corvus gypsiferous loam in an area of map unit CTC—Corvus-Peligro-Yesum complex, 1 to 8 percent slopes; Hudspeth County, Linda Lake North, Texas USGS topographic quadrangle; Latitude: 31 degrees, 59 minutes, 58.22 seconds North and Longitude: 105 degrees, 2 minutes, 44.67 seconds West. UTM Easting; 495679 meters, UTM Northing: 3540382 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Ayy—0 to 2 inches; very pale brown (10YR 7/3) gypsiferous loam, yellowish brown (10YR 5/4) moist; weak thick platy structure; slightly hard, friable, nonsticky, nonplastic; 75 percent prominent gypsum masses; strongly effervescence; slightly alkaline; gradual wavy boundary.

Byy1—2 to 6 inches; very pale brown (10YR 7/3) gypsiferous loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky, nonplastic; 80 percent prominent gypsum masses; strongly effervescence; slightly alkaline; very abrupt wavy boundary.

Byym—6 to 9 inches; very pale brown (10YR 8/3) gypsiferous cemented material, very pale brown (10YR 7/4) moist; very strongly cemented; slightly effervescence; slightly alkaline; gradual wavy boundary.

Byy2—9 to 30 inches; very pale brown (10YR 8/2) gypsiferous loam, light gray (10YR 7/2) moist; massive; moderately hard, firm, nonsticky, nonplastic; 85 percent prominent weakly cemented gypsum masses; slightly effervescence; slightly alkaline; diffuse wavy boundary.

Byy3—30 to 80 inches; white (10YR 8/1) gypsiferous loam, light gray (10YR 7/2) moist; massive; slightly hard, firm, nonsticky, nonplastic; 85 percent prominent moderately cemented gypsum masses; slightly effervescence; slightly alkaline.

Range in Characteristics

Depth to hypergypsic horizon: 0 to 6 inches
Depth to petrogypsic horizon: 6 to 12 inches
Reaction: slightly alkaline
Particle-size control section (weighted average):
Clay content: 10 to 26 percent

Ayy horizon

Hue: 10YR or 2.5Y
Value: 6 or 7 dry, 4 to 6 moist
Chroma: 3 or 4, dry or moist
Texture: Gypsiferous sandy loam, gypsiferous fine sandy loam, gypsiferous silt loam, or gypsiferous loam
Gypsum content: 60 to 90 percent
EC (mmhos/cm): 2 to 4
SAR: 0 to 4
Effervescence: Slightly or strongly

Byy horizon

Hue: 10YR or 2.5Y
Value: 7 or 8 dry, 5 to 8 moist
Chroma: 1 to 4, dry or moist
Texture: Gypsiferous loamy sand, gypsiferous sandy loam, or gypsiferous loam
Gypsum content: 60 to 95 percent
EC (mmhos/cm): 2 to 4
SAR: 0 to 8
Effervescence: Slightly or strongly

Byym horizon

Cementation class: Strongly to very strongly

Culberspeth Series

Map unit(s): CVC, CWC
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Fan remnants
Parent material: Gravelly alluvium derived from mixed sources and/or gravelly colluvium derived from mixed sources
Elevation: 4,000 to 5,500 feet
Slope: 1 to 8 percent
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 60 to 67 degrees F
Frost-free period: 200 to 250 days

Taxonomic Class

Loamy, mixed, superactive, thermic, shallow Calcic Petrocalcids

Typical Pedon

Culberspeth gravelly loam in an area of map unit CVC—Culberspeth-Chilicotal complex, 1 to 8 percent slopes; Hudspeth County, Sierra Blanca SW, Texas USGS topographic quadrangle; Latitude 31 degrees, 03 minutes, 14.29 seconds North and Longitude 105 degrees, 22 minutes, 45.13 seconds West. UTM Easting: 463819 meters, UTM Northing: 3435645 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 2 inches; yellowish brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable; slightly sticky and slightly plastic; few very fine and fine roots; 23 percent subrounded indurated limestone gravel; strongly effervescence; strongly alkaline; clear smooth boundary.

Bk—2 to 8 inches; light yellowish brown (10YR 6/4) gravelly loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; slightly hard, friable; slightly sticky and slightly plastic; 10 percent fine carbonate masses; 25 percent subangular indurated limestone gravel; strongly effervescence; strongly alkaline; very abrupt smooth boundary.

Bkkm—8 to 18 inches; cemented material; indurated; violently effervescence; strongly alkaline.

Range in Characteristics

Depth to petrocalcic horizon: 6 to 20 inches
Calcium carbonate equivalent: 5 to 35 percent
Particle-size control section (weighted average):
Clay content: 13 to 27 percent
Rock fragments: 10 to 35 percent gravel

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 to 5 moist
Chroma: 3 to 6 dry, 3 to 5 moist
Texture: Sandy loam, fine sandy loam, loam, or sandy clay loam
Rock fragments: 10 to 35 percent gravel
Effervescence: Slightly or strongly
Reaction: Moderately alkaline or strongly alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 3 or 4, dry or moist
Texture: Sandy loam, fine sandy loam, loam, or sandy clay loam
Rock fragments: 10 to 35 percent gravel
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Bkkm horizon

Cementation: Strongly cemented to indurated

Dalby Series

Map unit(s): VDA
Depth class: Very deep

Drainage class: Well drained
Slowest permeability: 0.001 to 0.06 in/hr (very slow)
Landform: Basin floors
Parent material: Clayey alluvium
Elevation: 4,000 to 5,500 feet
Slope: 0 to 1 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine, smectitic, thermic Chromic Haplotorrerts

Typical Pedon

Dalby silty clay loam in an area of map unit VDA—Verhalen-Dalby association, 0 to 1 percent slopes, rarely flooded; Lobo, Texas USGS topographic quadrangle; Latitude: 30 degrees, 51 minutes, 19.79 seconds North and Longitude: 104 degrees, 46 minutes, 47.90 seconds West. UTM Easting; 521037 meters, UTM Northing: 3413608 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Ap1—0 to 5 inches; brown (7.5YR 5/3) silty clay loam, dark brown (7.5YR 3/3) moist; weak fine and medium granular structure; very hard, very firm, very sticky, very plastic; common very fine, fine, and medium roots; common fine low continuity interstitial pores; strongly effervescence; slightly alkaline; abrupt smooth boundary.

Ap2—5 to 11 inches; brown (7.5YR 5/3) silty clay, dark brown (7.5YR 3/3) moist; weak medium and coarse subangular blocky structure; very hard, firm, very sticky, very plastic; common very fine, fine, medium, and coarse roots; common fine low continuity interstitial pores; slightly effervescence; moderately alkaline; clear smooth boundary.

Bss1—11 to 21 inches; brown (7.5YR 4/3) clay, dark brown (7.5YR 3/3) moist; strong fine angular blocky structure; hard, firm, very sticky, very plastic; common very fine and fine roots; common fine low continuity tubular pores; 20 percent distinct slickensides (pedogenic) on all faces of peds; strongly effervescence; moderately alkaline; clear smooth boundary.

Bss2—21 to 33 inches; brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; strong fine angular blocky structure; hard, firm, very sticky, very plastic; common very fine and fine roots; common fine low continuity tubular pores; 15 percent distinct slickensides (pedogenic) on all faces of peds; strongly effervescence; moderately alkaline; clear smooth boundary.

Bk—33 to 80 inches; brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; moderate fine and medium angular blocky structure; hard, firm, very sticky, very plastic; 3 percent very fine distinct carbonate masses; violently effervescence; moderately alkaline.

Range in Characteristics

Depth to vertic properties: 0 to 20 inches
Depth to secondary carbonates: 30 to 50 inches

Ap horizon

Hue: 5YR to 10YR
Value: 3 to 6 dry, 3 to 5 moist
Chroma: 3 or 4 dry, 2 to 4 moist
Texture: Silty clay loam, silty clay, sandy clay, or clay
Clay content: 33 to 55 percent
Calcium carbonate equivalent: 0 to 10 percent
Effervescence: Slightly or strongly

Reaction: Slightly alkaline or moderately alkaline

Bss horizon

Hue: 2.5YR to 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 to 6, dry or moist
Texture: Clay or silty clay
Clay content: 40 to 60 percent
Calcium carbonate equivalent: 2 to 10 percent
Effervescence: Slightly or strongly
Reaction: Moderately alkaline

Bk horizon

Hue: 2.5YR to 7.5YR
Value: 4 to 7 dry, 4 to 5 moist
Chroma: 3 to 6, dry or moist
Texture: Clay or silty clay
Clay content ranges: 45 to 60 percent
Calcium carbonate equivalent: 5 to 20 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Dellahunt Series

Map unit(s): DEB, DNB, EPA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Alluvial flats
Parent material: Loamy alluvium derived from sandstone and rock gypsum
Elevation: 4,000 to 5,500 feet
Slope: 0 to 5 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine-silty, mixed, superactive, thermic Ustic Calcigypsids

Typical Pedon

Dellahunt loam in an area of map unit DNB—Dellahunt-Neimahr-Joberanch complex, 1 to 3 percent slopes; KC Ranch, Texas USGS topographic quadrangle; Latitude: 31 degrees, 36 minutes, 44.32 seconds North and Longitude: 104 degrees, 25 minutes, 4.26 seconds West. UTM Easting: 555264 meters, UTM Northing: 3497598 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 4 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak fine platy structure; soft, friable, slightly sticky, slightly plastic; common fine roots; strongly effervescence; moderately alkaline; clear smooth boundary.

Bw1—4 to 10 inches; brown (10YR 5/3) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; soft, friable, slightly sticky, slightly plastic; common fine roots; strongly effervescence; moderately alkaline; clear smooth boundary.

Bw2—10 to 17 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse subangular blocky structure; slightly hard, firm, slightly sticky, slightly plastic; common fine roots; strongly effervescence; moderately alkaline; clear smooth boundary.

Bky1—17 to 31 inches; very pale brown (10YR 7/3) loam, brownish yellow (10YR 6/6) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky, slightly plastic; common fine roots; finely disseminated carbonates; 5 percent medium prominent spherical strongly cemented nests of gypsum with clear boundaries; violently effervescence; moderately alkaline; gradual smooth boundary.

Bky2—31 to 38 inches; very pale brown (10YR 7/4) silt loam, brownish yellow (10YR 6/6) moist; weak medium prismatic structure parting to moderate medium subangular blocky; moderately hard, firm, slightly sticky, slightly plastic; few fine roots; finely disseminated carbonates; 6 percent medium distinct spherical strongly cemented nests of gypsum with clear boundaries; violently effervescence; moderately alkaline; gradual smooth boundary.

Bky3—38 to 49 inches; yellow (10YR 7/6) silt loam, brownish yellow (10YR 6/6) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; few fine roots; finely disseminated carbonates; 3 percent medium distinct spherical strongly cemented nests of gypsum with clear boundaries; violently effervescence; moderately alkaline; abrupt smooth boundary.

Bky4—49 to 56 inches; 80 percent very pale brown (10YR 7/3) and 20 percent brownish yellow (10YR 6/8) very fine sandy loam, 80 percent pale brown (10YR 6/3) moist and 20 percent yellowish brown (10YR 5/6) moist; weak very coarse prismatic structure; very hard, firm, slightly sticky, slightly plastic; few fine roots; 1 percent fine distinct manganese masses with clear boundaries; finely disseminated carbonates; 20 percent medium distinct spherical strongly cemented nests of gypsum with clear boundaries; strongly effervescence; moderately alkaline; clear smooth boundary;

Bky5—56 to 80 inches; 80 percent brownish yellow (10YR 6/6) and 20 percent very pale brown (10YR 8/2) very fine sandy loam, 80 percent yellowish brown (10YR 5/6) moist and 20 percent light gray (10YR 7/2) moist; weak very coarse prismatic structure; slightly hard, friable, slightly sticky, slightly plastic; few fine roots; 25 percent medium distinct spherical strongly cemented nests of gypsum with clear boundaries; slightly effervescence; moderately alkaline.

Range in Characteristics

Depth to calcic horizon: 12 to 35 inches
Depth to gypsic horizon: 12 to 39 inches
Effervescence: Slightly to violently
Particle-size control section (weighted average):
Clay content: 18 to 35 percent

A horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 3 to 5 moist
Chroma: 2 to 5, dry or moist
Texture: Very fine sandy loam, silt loam, loam, silty clay loam, or clay loam
Calcium carbonate equivalent: 5 to 15 percent
Reaction: Moderately alkaline or strongly alkaline

Bw horizon or (Bk horizon where present)

Hue: 7.5YR to 2.5Y
Value: 5 to 7 dry, 3 to 6 moist
Chroma: 2 to 5, dry or moist
Texture: Very fine sandy loam, silt loam, loam, silty clay loam, or clay loam

Calcium carbonate equivalent: 20 to 30 percent
Reaction: Moderately alkaline or strongly alkaline

Bky or (By horizons where present)

Hue: 7.5YR to 2.5Y
Value: 4 to 8 dry, 3 to 7 moist
Chroma: 1 to 8, dry or moist
Texture: Very fine sandy loam, silt loam, or loam
Calcium carbonate equivalent: 10 to 30 percent
Gypsum content: 2 to 10 percent
Reaction: Moderately alkaline or strongly alkaline

Double Series

Map unit(s): DOC
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Alluvial fans
Parent material: Calcareous alluvium derived from limestone
Elevation: 4,000 to 5,500 feet
Slope: 1 to 8 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Ustic Haplocambids

Typical Pedon

Double loam in an area of map unit DOC—Double loam, 1 to 8 percent slopes; East Hunter Canyon, Texas USGS topographic quadrangle; Latitude: 31 degrees, 13 minutes, 46.43 seconds North and Longitude: 104 degrees, 25 minutes, 32.59 seconds West. UTM Easting: 554693 meters, UTM Northing: 3455186 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 4 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky, slightly plastic; common very fine and common fine roots; common fine irregular pores; 1 percent subrounded indurated limestone gravel; strongly effervescence; moderately alkaline; gradual smooth boundary.

Bw1—4 to 13 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; common very fine roots and common fine roots; common fine irregular pores; 2 percent subrounded indurated limestone gravel; strongly effervescence; moderately alkaline; gradual smooth boundary.

Bw2—13 to 23 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium and coarse prismatic structure; moderately hard, friable, moderately sticky, moderately plastic; common very fine, common fine roots, and few medium roots; common fine high continuity irregular pores; 3 percent subrounded indurated limestone gravel; strongly effervescence; moderately alkaline; gradual smooth boundary.

Bk1—23 to 38 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to moderate medium subangular

blocky structure; moderately hard, friable, moderately sticky, moderately plastic; common very fine roots; common fine irregular pores; 3 percent fine faint threadlike carbonate masses on vertical faces of peds and 1 percent fine faint spherical weakly cemented carbonate nodules; 4 percent subrounded indurated limestone gravel; strongly effervescence; moderately alkaline; gradual smooth boundary.

Bk2—38 to 56 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; moderately hard, friable, moderately sticky, moderately plastic; common fine roots; common medium irregular and common fine irregular pores; 2 percent fine threadlike carbonate masses and 1 percent fine spherical strongly cemented carbonate nodules; 5 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline; gradual smooth boundary.

Bk3—56 to 80 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; moderate medium subangular blocky structure; moderately hard, friable, moderately sticky, moderately plastic; common very fine roots; many fine vesicular pores; 5 percent fine threadlike carbonate masses and 2 percent fine weakly cemented carbonate nodules; 4 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline.

Range in Characteristics

Depth to cambic horizon: 4 to 15 inches
Depth to secondary carbonates: 20 to 30 inches
Reaction: Moderately alkaline
Particle-size control section (weighted average):
Clay content: 18 to 35 percent

A horizon

Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Loam
Rock fragments: 0 to 5 percent gravel
Effervescence: Slightly or strongly

Bw horizon

Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Rock fragments: 0 to 5 percent gravel
Effervescence: Slightly or strongly

Bk horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 3 or 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Rock fragments: 0 to 5 percent gravel
Effervescence: Strongly or violently

Elcor Series

Map unit(s): ELC, ELE, EPA, EPE
Depth class: Very shallow and shallow
Drainage class: Well drained

Slowest soil permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Hills
Parent material: Residuum weathered from rock gypsum
Elevation: 4,000 to 5,500 feet
Slope: 0 to 30 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine-gypseous, hypergypsic, thermic Lithic Haplogypsids

Typical Pedon

Elcor gypsiferous loam in an area of map unit ELE—Elcor gypsiferous silt loam, 5 to 30 percent slopes; Seven L Peak, Texas USGS topographic quadrangle; Latitude: 31 degrees, 40 minutes, 16.28 seconds North and Longitude: 104 degrees, 26 minutes, 0.53 seconds West; UTM Easting: 553749 meters, UTM Northing: 3503930 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Ayy—0 to 3 inches; light gray (10YR 7/2) gypsiferous loam, yellowish brown (10YR 5/6) moist; weak very fine subangular blocky structure; slightly hard, very friable, nonsticky, nonplastic; common very fine and fine roots; 65 percent prominent gypsum masses; slightly effervescence; moderately alkaline; clear broken boundary.

Byy—3 to 7 inches; very pale brown (10YR 8/3) gypsiferous loam, very pale brown (10YR 7/3) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky, nonplastic; very few fine roots; 80 percent prominent gypsum masses; very slightly effervescence; moderately alkaline; abrupt smooth boundary.

R—7 to 17 inches; gypsum bedrock; indurated; very few roots in mat at top of horizon; very slightly effervescence, moderately alkaline.

Range in Characteristics

Depth to hypergypsic horizon: 0 to 2 inches
Depth to lithic contact: 6 to 20 inches
Reaction: Slightly alkaline or moderately alkaline
Calcium carbonate equivalent: 0 to 10 percent
Particle-size control section (weighted average):
Gypsum content: 60 to 100 percent

Ayy horizon (or Ay horizon where present)

Hue: 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 6, dry or moist
Texture: Gypsiferous loam or gypsiferous silt loam
Effervescence: Very slightly or slightly

Byy horizon (or Cyy horizon where present)

Hue: 10YR or 2.5Y
Value: 7 or 8 dry, 6 to 8 moist
Chroma: 1 to 4, dry or moist
Texture: Gypsiferous loam or gypsiferous silt loam
Effervescence: Very slightly or slightly

R layer

Bedrock kind: Rock gypsum bedrock

Gypsic Aquisalids

Map unit(s): GAA
Depth class: Very deep
Drainage class: Poorly drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Basin floors
Parent material: Gypsiferous loamy lacustrine deposits
Elevation: 3,000 to 4,000 feet
Slope: 0 to 2 percent
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Taxonomic Class

Gypsic Aquisalids

Typical Pedon

Gypsic aquisalids silt loam in an area of map unit GAA—Gypsic Aquisalids, 0 to 2 percent slopes, occasionally flooded; Derrick Draw, Texas USGS topographic quadrangle; Latitude: 31 degrees, 43 minutes, 19.51 seconds North and Longitude: 104 degrees, 3 minutes, 46.03 seconds West. UTM Easting: 588793 meters, UTM Northing: 3510013 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Az—0 to 5 inches; brown (7.5YR 5/4) silt loam, brown (7.5YR 4/4) moist; moderate thin platy structure; slightly hard, friable, nonsticky, nonplastic; 10 percent fine prominent threadlike iron-manganese nodules with clear boundaries on horizontal faces of peds and 10 percent fine prominent threadlike yellowish brown (10YR 5/6), moist, iron-manganese nodules with clear boundaries on surfaces along root channels; 10 percent fine prominent salt crystals with clear boundaries; violently effervescence; moderately alkaline; gradual smooth boundary.

Byz1—5 to 15 inches; grayish brown (10YR 5/2) silt loam, dark grayish brown (10YR 4/2) moist; strong medium platy structure, and strong medium subangular blocky structure; slightly hard, friable, nonsticky, nonplastic; 5 percent fine prominent threadlike iron-manganese nodules with clear boundaries on horizontal faces of peds, and 10 percent fine prominent threadlike iron-manganese nodules with clear boundaries on surfaces along root channels; 10 percent gypsum, finely disseminated; 30 percent fine prominent salt crystals with clear boundaries; violently effervescence; moderately alkaline; gradual smooth boundary.

Byz2—15 to 45 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; hard, friable, moderately sticky, moderately plastic; 5 percent fine prominent iron-manganese nodules with clear boundaries on horizontal faces of peds and 10 percent fine prominent threadlike iron-manganese nodules with clear boundaries on surfaces along root channels; 10 percent medium faint dark gray (10YR 4/1), moist, reduced matrix; 10 percent gypsum, finely disseminated; 30 percent fine prominent salt crystals with clear boundaries; violently effervescence; moderately alkaline; gradual smooth boundary.

Byz3—45 to 51 inches; light yellowish brown (10YR 6/4) silty clay loam, yellowish brown (10YR 5/4) moist; moderate medium granular structure; hard, friable, moderately sticky, moderately plastic; 5 percent fine prominent threadlike iron-manganese nodules with clear boundaries on surfaces along root channels; 15 percent gypsum, finely disseminated; 50 percent fine prominent salt crystals with clear boundaries; violently effervescence; moderately alkaline; gradual smooth boundary.

Byz4—51 to 80 inches; light yellowish brown (10YR 6/4) silty clay loam, yellowish brown (10YR 5/4) moist; moderate medium granular structure; hard, friable, moderately sticky, moderately plastic; 3 percent fine prominent threadlike iron-manganese nodules with clear boundaries on surfaces along root channels; 5 percent gypsum, finely disseminated; 50 percent fine prominent salt crystals with clear boundaries; violently effervescence; moderately alkaline.

Range in Characteristics

Reaction: Moderately alkaline
Other features: Contains stratifications of coarser or finer material within horizons. Stratification ranges from less than 1 inch to 4 inches in thickness.
Particle-size control section (weighted average):
Clay content: 10 to 28 percent
EC (mmhos/cm): 32 to 99
SAR: 50 to 120

Az horizon

Hue: 7.5YR or 10YR
Value: 4 to 8 dry or moist
Chroma: 2 to 4, dry or moist
Texture: Loam, silt loam, clay loam, or silty clay loam
Effervescence: Strongly or violently

Byz horizon

Hue: 7.5YR to 10YR
Value: 3 to 8 dry or moist
Chroma: 1 to 4, dry or moist
Texture: Silt loam or silty clay loam
Effervescence: Strongly or violently

Hollebeke Series

Map unit(s): HPC
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability to 60 inches: 0.6 to 2.0 (moderate)
Landform: Low hills
Parent material: Residuum weathered from rock gypsum
Slope: 1 to 8 percent
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine-gypseous, hypergypsic, thermic, shallow Ustic Petrogypsids

Typical Pedon

Hollebeke loam in an area of map unit HPC—Hollebeke-Pokorny complex, 1 to 8 percent slopes; Seven L Peak, Texas USGS topographic quadrangle; Latitude: 31 degrees, 53 minutes, 0.85 seconds North and Longitude: 104 degrees, 19 minutes, 37.67 seconds West. UTM Easting: 553081 meters, UTM Northing: 3503214 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 1 inch; pale brown (10YR 6/3) loam, yellowish brown (10YR 5/4) moist; weak medium platy parting to weak fine subangular blocky structure; loose, loose, slightly sticky, slightly plastic; strongly effervescence; slightly alkaline; clear wavy boundary.

Byy—1 to 4 inches; white (10YR 8/1) gypsiferous silt loam, very pale brown (10YR 8/3) moist; weak thick platy structure; slightly hard, very firm, nonsticky, nonplastic; brittle; few very fine, few fine, and few medium roots; very slightly effervescence; slightly alkaline; clear smooth boundary.

Byym—4 to 12 inches; white (10YR 8/1) gypsiferous cemented material, very pale brown (10YR 8/2) moist; massive; very weakly cemented; brittle; few very fine, common fine, and common medium roots in cracks, common very fine, common fine, common medium, and common coarse roots on top of horizon; very slightly effervescence; slightly alkaline; very abrupt smooth boundary.

R—12 to 22 inches; gypsum bedrock; indurated; few fine and few medium roots on top of horizon; noneffervescent; slightly alkaline.

Range in Characteristics

Depth to petrogypsic horizon: 2 to 10 inches
Depth to lithic contact: 10 to 20 inches
Calcium carbonate equivalent: 0 to 10 percent
Reaction: Slightly alkaline to strongly alkaline
Particle-size control section (weighted average):
Gypsum equivalent: 80 to 100 percent

A horizon

Hue: 10YR or 2.5Y
Value: 6 or 7 dry, 4 to 6 moist
Chroma: 3 or 4, dry or moist
Texture: Loam or silt loam
Effervescence: Slightly to strongly

Ayy horizon (where present)

Hue: 10YR to 5Y
Value: 7 or 8, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Gypsiferous loam or gypsiferous silt loam
Effervescence: Very slightly to slightly

Byy horizon

Hue: 10YR or 2.5Y
Value: 7 or 8 dry, 6 to 8 moist
Chroma: 1 to 4, dry or moist
Texture: Gypsiferous silt loam or gypsiferous loam
Effervescence: Very slightly to slightly

Byym horizon

Hue: 10YR or 2.5Y
Value: 7 or 8 dry; 6 to 8 moist
Chroma: 1 to 5, dry or moist
Texture: Cemented material
Effervescence: Very slightly to slightly
Cementation class: Extremely weakly cemented to moderately cemented

R layer

Bedrock kind: Rock gypsum bedrock

Hollomex Series

Map unit(s): EPE
Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: 0.6 to 2.0 in/hr (moderate)
Landform: Terraces
Parent material: Calcareous and gypsiferous loamy alluvium derived from rock gypsum
Elevation: 4,000 to 5,500 feet
Slope: 1 to 10 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine-gypseous, hypergypsic, thermic Ustic Haplogypsids

Typical Pedon

Hollomex loam in an area of map unit EPE—Elcor-Pokorny-Hollomex-Walkerwells complex, 0 to 30 percent slopes; Seven L Peak, Texas USGS topographic quadrangle; Latitude: 31 degrees, 39 minutes, 40.22 seconds North and Longitude: 104 degrees, 23 minutes, 32.07 seconds West. UTM Easting: 557617 meters, UTM Northing: 3503041 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 2 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; loose, loose, slightly sticky, slightly plastic; strongly effervescence; moderately alkaline; clear smooth boundary.

Cyy1—2 to 33 inches; pale brown (10YR 6/3) gypsiferous loam, brown (10YR 5/3) moist; single grain; loose, loose, slightly sticky, slightly plastic; strongly effervescence; moderately alkaline; clear smooth boundary.

Cyy2—33 to 80 inches; very pale brown (10YR 7/3) gypsiferous fine sandy loam, pale brown (10YR 6/3) moist; single grain; loose, loose, slightly sticky, slightly plastic; strongly effervescence; moderately alkaline.

Range in Characteristics

Depth to hypergypsic horizon: 0 to 10 inches
Rock fragments: Less than 5 percent
Organic carbon (upper 16 inches): Less than 0.4 percent
Particle-size control section (weighted average):
Gypsum equivalent: 40 to 80 percent

A horizon

Hue: 5YR to 10YR
Value: 4 to 7 dry, 3 to 5 moist
Chroma: 1 to 4
Texture: Sandy loam, fine sandy loam, loam, silt loam, sandy clay loam, or clay loam
Effervescence: Slightly to strongly
Reaction: Slightly alkaline to moderately alkaline

Ayy, Cyy, or Ckyy horizons (where present)

Hue: 2.5YR to 2.5Y
Value: 6 to 8 dry, 3 to 7 moist
Chroma: 1 to 6

Texture: Gypsiferous sandy loam, gypsiferous fine sandy loam, gypsiferous loam, gypsiferous silt loam, gypsiferous sandy clay loam, or gypsiferous clay loam
Effervescence: Slightly to strongly
Reaction: Slightly alkaline to moderately alkaline

Horsetrap Series

Map unit(s): BVE, HRC
Depth class: Shallow
Drainage class: Well drained
Slowest soil permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Hills, low hills
Parent material: Gravelly residuum weathered from basalt and/or gravelly colluvium derived from basalt
Elevation: 4,000 to 5,500 feet
Slope: 1 to 30 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplocambids

Typical Pedon

Horsetrap gravelly sandy loam in an area of map unit HRC—Horsetrap-Bofecillos complex, 1 to 8 percent slopes; Chispa Mountain NW, Texas USGS topographic quadrangle; Latitude: 30 degrees, 54 minutes, 6.61 seconds North and Longitude: 104 degrees, 38 minutes, 22.67 seconds West. UTM Easting: 534438 meters, UTM Northing: 3418779 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 9 inches; brown (7.5YR 4/3) gravelly sandy loam, dark brown (7.5YR 3/3) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable, slightly sticky, slightly plastic; many fine and medium roots; 2 percent carbonate coats on rock fragments; 2 percent fine faint carbonate masses; 15 percent subrounded igneous gravel; strongly effervescence; moderately alkaline; gradual smooth boundary.

Bk—9 to 17 inches; dark yellowish brown (10YR 4/4) very gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; many very fine and fine roots; 5 percent carbonate coats on rock fragments; 3 percent fine distinct moderately cemented carbonate concretions with clear boundaries; 40 percent subrounded igneous gravel; strongly effervescence; moderately alkaline; very abrupt wavy boundary.

R—17 to 27 inches; indurated basalt bedrock.

Range in Characteristics

Depth to cambic horizon: 5 to 10 inches
Depth to lithic contact: 12 to 20 inches
Particle-size control section (weighted average):
Clay content: 15 to 26 percent

A horizon

Hue: 7.5YR to 2.5Y
Value: 3 to 6 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist

Texture: Sandy loam, loam, or sandy clay loam
Rock fragments: 10 to 50 percent with 5 to 40 percent gravel, 0 to 10 percent cobbles
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: None to strongly
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR to 2.5Y
Value: 3 to 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, loam, sandy, or clay loam
Rock fragments: 35 to 60 percent with 20 to 35 percent gravel, 15 to 25 percent cobbles
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Very slightly to strongly
Reaction: Slightly alkaline or moderately alkaline

R layer

Bedrock kind: Basalt bedrock

Joberanch Series

Map unit(s): DNB
Depth class: Shallow
Drainage class: Well drained
Slowest soil permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Alluvial flats
Parent material: Alluvium weathered from rock gypsum and sandstone
Elevation: 4,000 to 5,500 feet
Slope: 1 to 3 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Loamy, mixed, superactive, thermic, shallow Ustic Petrogypsids

Typical Pedon

Joberanch loam in an area of map unit DNB—Dellahunt-Neimahr-Joberanch complex, 1 to 3 percent slopes; KC Ranch, Texas USGS topographic quadrangle; Latitude: 31 degrees, 36 minutes, 52.04 seconds North and Longitude: 104 degrees, 22 minutes, 45.87 seconds West. UTM Easting: 555747 meters, UTM Northing: 3497839 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A1—0 to 3 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; strong medium platy structure; slightly hard, very friable, nonsticky, slightly plastic; common very fine and fine roots; 3 percent prominent cylindrical manganese coatings infused into matrix adjacent to pores; 2 percent prominent manganese masses; violently effervescence; moderately alkaline; clear smooth boundary.

A2—3 to 8 inches; pale yellow (2.5Y 7/3) clay loam, light yellowish brown (2.5Y 6/4) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky, slightly plastic; common very fine and fine roots; violently effervescence; moderately alkaline; clear smooth boundary.

Bky—8 to 12 inches; light yellowish brown (2.5Y 6/3) loam, light yellowish brown (2.5Y 6/4) moist; weak coarse prismatic structure parting to moderate medium subangular

blocky; moderately hard, friable, slightly sticky, slightly plastic; common very fine and fine roots; violently effervescence; moderately alkaline; very abrupt wavy boundary.

2Byym1—12 to 19 inches; pale yellow (2.5Y 8/2) gypsiferous cemented material, light gray (10YR 7/2) moist; massive; moderately cemented; very few very fine roots in cracks; violently effervescent; moderately alkaline; gradual smooth boundary.

2Byym2—19 to 32 inches; pale yellow (2.5Y 8/2) gypsiferous cemented material, light gray (10YR 7/2) moist; massive; very strongly cemented; very few very fine roots in cracks and few medium roots in mat at top of horizon; violently effervescence; moderately alkaline; abrupt wavy boundary.

2Byym3—32 to 49 inches; very pale brown (10YR 7/3) gypsiferous cemented material, light yellowish brown (10YR 6/4) moist; massive; very strongly cemented; very few very fine roots; strongly effervescence; moderately alkaline; gradual smooth boundary.

2Byym4—49 to 59 inches; white (10YR 8/1) gypsiferous cemented material, light gray (10YR 7/2) moist; massive; very strongly cemented; very few very fine roots; strongly effervescence; moderately alkaline; gradual smooth boundary.

2Byym5—59 to 72 inches; very pale brown (10YR 8/3) gypsiferous cemented material, pale yellow (2.5Y 7/4) moist; strongly cemented; very few very fine roots; strongly effervescence; moderately alkaline; gradual smooth boundary.

2Byym6—72 to 80 inches; light gray (10YR 7/2) gypsiferous cemented material, light yellowish brown (2.5Y 6/3) moist; moderately cemented; very few very fine roots; slightly effervescence; moderately alkaline.

Range in Characteristics

Depth to petrogypsic horizon: 10 to 20 inches
Reaction: Moderately alkaline
Particle-size control section (weighted average):
Clay content: 15 to 30 percent

A horizon

Hue: 7.5YR to 2.5Y
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 2 to 5, dry or moist
Texture: Very fine sandy loam, loam, silt loam, silty clay loam, or clay loam
Clay content: 15 to 30 percent
Calcium carbonate equivalent: 15 to 40 percent
Effervescence: Strongly or violently

Bky or Bw horizons (where present)

Hue: 7.5YR to 2.5Y
Value: 4 to 8 dry, 2 to 7 moist
Chroma: 2 to 5, dry or moist
Texture: Loam, silt loam, silty clay loam, or clay loam
Clay content: 15 to 30 percent
Calcium carbonate equivalent: 15 to 40 percent
Gypsum content: 0 to 5 percent
Effervescence: Strongly or violently

2Byym horizon

Cementation: Moderately to very strongly cemented

Kahn Series

Map unit(s): CWC

Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Fan remnants, alluvial flats
Parent material: Calcareous alluvium derived from limestone
Elevation: 4,000 to 5,500 feet
Slope: 1 to 8 percent
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 60 to 67 degrees F
Frost-free period: 200 to 250 days

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Ustic Haplocalcids

Typical Pedon

Kahn sandy loam in an area of map unit KAB—Kahn sandy loam, 1 to 3 percent slopes; Hudspeth County, Sierra Blanca SW, Texas USGS topographic quadrangle; Latitude: 31 degrees, 7 minutes, 1.00 seconds North and Longitude: 105 degrees, 24 minutes, 13.36 seconds West. UTM Easting: 461506 meters, UTM Northing: 3442633 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 7 inches; brown (7.5YR 5/3), sandy loam, brown (7.5YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky, nonplastic; common very fine and fine roots between peds; common fine and medium moderate continuity irregular pores; 2 percent subrounded indurated limestone gravel; strongly effervescence; slightly alkaline; clear wavy boundary.

Bw—7 to 18 inches; brown (7.5YR 4/4), sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; common very fine and fine roots between peds; common fine and medium moderate continuity irregular pores; 2 percent subrounded indurated limestone gravel; strongly effervescence; moderately alkaline; clear wavy boundary.

Bk1—18 to 33 inches; light brown (7.5YR 6/3), gravelly sandy clay loam, brown (7.5YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky, slightly plastic; 15 percent fine distinct carbonate masses with clear boundaries; 20 percent subrounded, indurated, limestone gravel; violently effervescence; moderately alkaline; clear wavy boundary.

Bk2—33 to 80 inches; light brown (7.5YR 6/3), gravelly sandy clay loam, brown (7.5YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 10 percent fine distinct carbonate masses with clear boundaries; 20 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline.

Range in Characteristics

Depth to cambic horizon: 5 to 15 inches
Depth to calcic horizon: 15 to 43 inches
Particle-size control section (weighted average):
  Clay content: 18 to 30 percent
  Organic carbon: 0.25 to 1.00 percent

A horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, silt loam, loam, sandy clay loam, or clay loam
Rock fragments: 0 to 10 percent gravel

Calcium carbonate equivalent: 3 to 15 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline

Bw horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, silt loam, loam, sandy clay loam, or clay loam
Rock fragments: 0 to 10 percent gravel
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 7 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: Loam, silty clay loam, sandy clay loam, or clay loam
Rock fragments: 3 to 30 percent gravel
Calcium carbonate equivalent: 15 to 30 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Kinco Series

Map unit(s): KPB
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Interdunes on alluvial flats
Parent material: Loamy alluvium derived from igneous and sedimentary rock
Elevation: 4,000 to 5,500 feet
Slope: 1 to 5 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Coarse-loamy, mixed, superactive, thermic Ustic Haplocalcids

Typical Pedon

Kinco loamy coarse sand in an area of map unit KPB—Kinco-Aguena-Perilla complex, 1 to 5 percent slopes; Plateau, Texas USGS topographic quadrangle; Latitude: 31 degrees, 5 minutes, 16.22 seconds North and Longitude: 104 degrees, 35 minutes, 28.88 seconds West. UTM Easting: 538976 meters, UTM Northing: 3439408 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 8 inches; reddish brown (5YR 5/4) loamy coarse sand, reddish brown (5YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; noneffervescent; moderately alkaline; clear smooth boundary.

Bw1—8 to 16 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; noneffervescent; moderately alkaline; clear smooth boundary.

Bw2—16 to 31 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 5/6) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; slightly effervescence; moderately alkaline; clear smooth boundary.

Bk1—31 to 47 inches; light reddish brown (5YR 6/3) loamy coarse sand, reddish brown (5YR 5/3) moist; single grain; loose, loose, nonsticky, nonplastic; 5 percent medium moderately cemented carbonate nodules with clear boundaries and 15 percent coarse carbonate masses with clear boundaries; strongly effervescence; moderately alkaline; clear smooth boundary.

Bk2—47 to 55 inches; light brown (7.5YR 6/4) loamy very fine sand, brown (7.5YR 5/4) moist; single grain; loose, loose, nonsticky, nonplastic; 8 percent medium carbonate masses with clear boundaries; strongly effervescence; moderately alkaline; clear smooth boundary.

Bk3—55 to 80 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; 2 percent medium carbonate masses with clear boundaries and 5 percent medium moderately cemented carbonate nodules with clear boundaries; strongly effervescence; moderately alkaline.

Range in Characteristics

Depth to calcic horizon: 24 to 40 inches
Particle-size control section (weighted average):
Clay content: 10 to 18 percent

A horizon

Hue: 5YR to 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 to 6, dry or moist
Texture: Loamy sand, loamy coarse sand, or fine sandy loam
Effervescence: None or slightly
Reaction: Moderately alkaline

Bw horizon

Hue: 5YR to 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 3 to 6, dry or moist
Texture: Coarse sandy loam, sandy loam, fine sandy loam, or loam
Effervescence: None or slightly
Reaction: Moderately alkaline

Bk horizon

Hue: 5YR or 7.5YR
Value: 6 to 8 dry, 5 or 6 moist
Chroma: 2 to 6, dry or moist
Texture: Loamy sand, loamy coarse sand, loamy very fine sand, coarse sandy loam, fine sandy loam, very fine sandy loam, or sandy clay loam
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Lampshire Series

Map unit(s): LPG, RXG
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 0.6 to 2.0 in/hr (moderate)

Landform: Hills
Parent material: Gravelly colluvium derived from granite or basalt and/or gravelly residuum weathered from granite or basalt
Elevation: 4,000 to 5,500 feet
Slope: 5 to 60 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, nonacid, thermic Lithic Ustic Torriorthents

Typical Pedon

Lampshire very gravelly coarse sandy loam in an area of map unit RXG—Rock outcrop-Lampshire complex, 5 to 60 percent slopes; Chispa Mountain NW, Texas USGS topographic quadrangle; Latitude: 30 degrees, 55 minutes, 19.05 seconds North and Longitude: 104 degrees, 41 minutes, 52.28 seconds West. UTM Easting: 528868 meters, UTM Northing: 3420992 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 4 inches; brown (7.5YR 4/3), very gravelly coarse sandy loam, dark brown (7.5YR 3/3) moist; weak fine subangular blocky structure; loose, loose, slightly sticky, slightly plastic; noneffervescent; 5 percent angular indurated igneous cobbles, and 40 percent subangular indurated igneous gravel; neutral; very abrupt smooth boundary.
R—4 to 14 inches; indurated granite bedrock.

Range in Characteristics

Depth to lithic contact: 4 to 20 inches
Organic matter content: 1 to 2 percent
Particle-size control section (weighted average)
Clay content: 2 to 18 percent
Rock fragments: 35 to 70 percent with 20 to 30 percent gravel, 15 to 40 percent cobbles

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 6 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sandy loam, sandy loam, or loam
Calcium carbonate content: 0 to 2 percent
Effervescence: None to slightly
Reaction: Neutral to slightly alkaline

R layer

Bedrock kind: Granite or basalt bedrock

Lark Series

Map unit(s): LRE
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: Greater than 20 in/hr (very rapid)
Landform: Lunette playa dunes
Parent material: Gypsiferous eolian sands
Elevation: 3,000 to 4,000 feet

Slope: 5 to 20 percent
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Taxonomic Class

Hypergypsic, thermic Typic Torripsamments

Typical Pedon

Lark gypsiferous sand in an area of map unit LRE—Lark gypsiferous sand, 5 to 20 percent slopes; Hudspeth County, Linda Lake North, Texas USGS topographic quadrangle; Latitude: 31 degrees, 55 minutes, 7.82 seconds North and Longitude: 105 degrees, 5 minutes, 56.35 seconds West. UTM Easting: 490642 meters, UTM Northing: 3531444 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Cyy1—0 to 18 inches; very pale brown (10YR 8/2) gypsiferous sand, white (10YR 8/1), dry; massive; loose, loose, nonsticky, nonplastic; 85 percent fine prominent extremely weakly cemented gypsum crystals with sharp boundaries; noneffervescent; neutral; gradual smooth boundary.

Cyy2—18 to 80 inches; white (10YR 8/1) gypsiferous sand, white (10YR 8/1), dry; massive; loose, loose, nonsticky, nonplastic; 95 percent fine prominent extremely weakly cemented gypsum crystals with sharp boundaries; noneffervescent; neutral.

Range in Characteristics

Reaction: Neutral to slightly alkaline
Salinity: Very slight to moderate
Particle-size control section (weighted average):
Clay content: 0 to 2 percent
Gypsum content: 65 to 100 percent

Ayy horizon (where present)

Hue: 10YR or 2.5Y
Value: 6 to 8 dry, 7 to 8 moist
Chroma: 1 to 4, dry or moist
Texture: Gypsiferous sand, gypsiferous coarse sand, or gypsiferous fine sand
Effervescence: None or slightly

Cyy horizon

Hue: 10YR or 2.5Y
Value: 6 to 8 dry, 7 to 8 moist
Chroma: 1 to 4, dry or moist
Texture: Gypsiferous sand, gypsiferous fine sand, or gypsiferous coarse sand
Effervescence: None or slightly

Leyva Series

Map unit(s): BVC, BVE
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Hills, Low hills
Parent material: Residuum weathered from igneous rock and/or colluvium derived from igneous rock
Elevation: 4,000 to 5,500 feet

Slope: 1 to 30 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Clayey-skeletal, mixed, superactive, thermic Lithic Ustic Haplargids

Typical Pedon

Leyva very gravelly clay loam (fig. 33) in an area of map unit BVC—Bofecillos-Leyva complex, 1 to 8 percent slopes; Chispa Mountain NW, Texas USGS topographic quadrangle; Latitude: 30 degrees, 49 minutes, 3.85 seconds North and Longitude: 104 degrees, 51 minutes, 32.61 seconds West. UTM Easting: 538963 meters, UTM Northing: 3439819 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 6 inches; brown (7.5YR 4/4) very gravelly clay loam, dark brown (7.5YR 3/4) moist; weak fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; 2 percent distinct carbonate coats on rock fragments; 10 percent subangular indurated trachyte cobbles, and 40 percent subangular indurated trachyte gravel; slightly effervescence; neutral; gradual smooth boundary.

Bt—6 to 12 inches; brown (7.5YR 5/4) very gravelly clay, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 15 percent faint clay films on all faces of peds; 2 percent distinct carbonate coats on rock fragments; 9 percent subangular indurated trachyte cobbles, and 50 percent subangular indurated trachyte gravel; strongly effervescence; neutral; very abrupt smooth boundary.

R—12 to 22 inches; indurated igneous bedrock.

Range in Characteristics

Depth to bedrock: 8 to 18 inches
Particle-size control section (weighted average):
Clay content: 35 to 50 percent
Calcium carbonate equivalent: 0 to 5 percent
Rock fragments: 40 to 70 percent with 15 to 55 percent gravel, 0 to 30 percent cobbles

A horizon

Hue: 5YR or 7.5YR
Value: 3 to 5 dry, 2.5 to 4 moist
Chroma: 2 to 4 dry or moist
Texture: Sandy clay loam or clay loam
Rock fragments: 25 to 70 percent with 15 to 55 percent gravel, 0 to 30 percent cobbles
Effervescence: Slightly or strongly
Reaction: Neutral

Bt horizon

Hue: 5YR or 7.5YR
Value: 3 to 5 dry, 2.5 to 4 moist
Chroma: 2 to 6, dry or moist
Texture: Clay loam or clay
Rock fragments: 45 to 70 percent with 15 to 55 percent gravel, 0 to 30 percent cobbles
Effervescence: Slightly or strongly
Reaction: Neutral

R layer

Bedrock kind: Igneous bedrock

Figure 33.—Profile of Leyva very gravelly clay loam in an area of Bofecillos-Leyva complex, 1 to 8 percent slopes. Leyva soils contain more than 35 percent coarse fragments and are very shallow and shallow. The substratum is igneous bedrock. (Scale in centimeters)

Loki Series

Map unit(s): YLA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Alluvial flats
Parent material: Loamy alluvium over gypsiferous lacustrine deposits
Elevation: 3,000 to 4,000 feet
Slope: 0 to 1 percent
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Taxonomic Class

Loamy over coarse-gypseous, mixed over hypergypsic, superactive, thermic Typic Calcigypsids

Typical Pedon

Loki loam in an area of map unit YLA—Yesum-Loki-Corvus complex, 0 to 1 percent slopes; Hudspeth County, Tepee Butte SW, Texas topographic quadrangle; Latitude: 31 degrees, 58 minutes, 3.41 seconds North and Longitude: 105 degrees, 7 minutes, 56.51 seconds West. UTM Easting: 487493 meters, UTM Northing: 3536854 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Apy—0 to 3 inches; brown (7.5YR 5/4) loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable, moderately sticky, moderately plastic; 4 percent fine faint gypsum masses with clear boundaries; strongly effervescence; moderately alkaline; clear smooth boundary.

Bky—3 to 14 inches; brown (7.5YR 5/4) silt loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 2 percent very fine faint carbonate masses with clear boundaries, 10 percent fine distinct gypsum masses with clear boundaries; strongly effervescence; moderately alkaline; abrupt smooth boundary.

Byy1—14 to 43 inches; white (10YR 8/1) gypsiferous silt loam, white (10YR 8/1) moist; massive; moderately hard, firm, moderately sticky, moderately plastic; 85 percent prominent gypsum masses; strongly effervescence; moderately alkaline; clear smooth boundary.

Byy2—43 to 80 inches; white (10YR 8/1) gypsiferous silt loam, very pale brown (10YR 8/2) moist; massive; moderately hard, firm, moderately sticky, moderately plastic; 85 percent prominent gypsum masses; strongly effervescence; moderately alkaline.

Range in Characteristics

Depth to gypsic horizon: 2 to 10 inches
Depth to hypergypsic horizon: 10 to 20 inches

Apy or A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 to 6, dry or moist
Texture: Loam or silt loam
Clay content: 12 to 26 percent
Gypsum content: 0 to 5 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Bky horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 to 6, dry or moist
Texture: Loam or silt loam
Clay content: 6 to 26 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Byy horizon

Hue: 10YR or 2.5Y
Value: 7 or 8 dry, 7 or 8 moist

Chroma: 1 to 4, dry or moist
Texture: Gypsiferous loam or gypsiferous silt loam
Clay content: 12 to 26 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

McAllister Series

Map unit(s): MAB
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Alluvial fans
Parent material: Loamy alluvium derived from mixed sources
Elevation: 4,000 to 5,500 feet
Slope: 0 to 3 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Ustic Calciargids

Typical Pedon

McAllister fine sandy loam in an area of map unit MAB—McAllister fine sandy loam, 0 to 3 percent slopes; Wild Horse, Texas USGS topographic quadrangle; Latitude: 31 degrees, 6 minutes, 15.11 seconds North and Longitude: 104 degrees, 42 minutes, 52.13 seconds West. UTM Easting: 527228 meters, UTM Northing: 3441185 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Ap—0 to 8 inches; brown (7.5YR 5/3) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky, nonplastic; strongly effervescence; slightly alkaline; clear smooth boundary.

Bt—8 to 20 inches; brown (7.5YR 5/3) sandy clay loam, brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; moderately hard, friable, slightly sticky, nonplastic; 10 percent distinct clay bridges on all faces of peds; 1 percent faint threadlike carbonate masses; strongly effervescence; slightly alkaline; clear smooth boundary.

Btk1—20 to 38 inches; brown (7.5YR 5/4) sandy clay loam, strong brown (7.5YR 4/6) moist; moderate fine and medium subangular blocky structure; moderately hard, firm, very sticky, moderately plastic; 20 percent distinct clay films on all faces of peds; 10 percent prominent carbonate masses and 5 percent prominent threadlike carbonate masses; strongly effervescence; moderately alkaline; clear smooth boundary.

Btk2—38 to 63 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 5/4) moist; moderate fine and medium subangular blocky structure; moderately hard, firm, very sticky, moderately plastic; 25 percent distinct clay films on all faces of peds; 10 percent prominent carbonate masses and 7 percent prominent threadlike carbonate masses and carbonate, finely disseminated; strongly effervescence; moderately alkaline; clear smooth boundary.

Bk—63 to 80 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; moderate fine and medium subangular blocky structure; soft, friable, slightly sticky, nonplastic; 1 percent prominent threadlike carbonate masses and carbonate finely disseminated; slightly effervescence; moderately alkaline.

Range in Characteristics

Depth to argillic horizon: 6 to 12 inches
Depth to calcic horizon: 20 to 40 inches
Rock fragments: 0 to 30 percent gravel
Organic matter: 1 to 2 percent in the surface
Particle-size control section (weighted average):
Clay content: 18 to 35 percent

A or Ap horizons

Hue: 5YR or 7.5YR
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 to 4 dry, 3 or 4 moist
Texture: Fine sandy loam, sandy clay loam, or clay loam
Clay content: 15 to 27 percent
Calcium carbonate equivalent: 0 to 3 percent
Effervescence: Slightly or strongly
Reaction: Neutral to moderately alkaline

Bt horizon

Hue: 2.5YR to 7.5YR
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 3 to 6 dry, 4 to 6 moist
Texture: Sandy clay loam or clay loam
Clay content: 18 to 35 percent
Effervescence: Slightly or strongly
Reaction: Neutral to moderately alkaline

Btk horizon

Hue: 2.5YR to 7.5YR
Value: 5 to 7 dry, 4 to 7 moist
Chroma: 3 to 6 dry; 4 or 6 moist
Texture: Sandy clay loam or clay loam
Clay content: 18 to 35 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 2.5YR to 7.5YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 3 to 6 dry, 4 or 6 moist
Texture: Sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam
Clay content: 15 to 27 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Michigan Series

Map unit(s): MCB
Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: 0.2 to 0.6 in/hr (moderately slow)
Landform: Alluvial flats
Parent material: Clayey alluvium derived from igneous and sedimentary rock

Elevation: 4,000 to 5,500 feet
Slope: 0 to 3 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine, mixed, superactive, thermic Ustic Haplocambids

Typical Pedon

Michigan clay in an area of map unit MCB—Michigan clay, 0 to 3 percent slopes; Watson Ranch, Texas USGS topographic quadrangle; Latitude: 31 degrees, 08 minutes, 9.0 seconds North and Longitude: 104 degrees, 43 minutes, 10.0 seconds West. UTM Easting: 526750 meters, UTM Northing: 3444685 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Ap—0 to 7 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate fine and medium angular blocky structure; hard, firm, very sticky, very plastic; slightly effervescence; moderately alkaline; clear smooth boundary.

Bw—7 to 21 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; weak medium subangular blocky parting to moderate fine subangular blocky structure; slightly hard, firm, very sticky, very plastic; strongly effervescence; moderately alkaline; gradual smooth boundary.

Bk1—21 to 41 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, very sticky, very plastic; 2 percent fine faint carbonate masses; 1 percent subrounded indurated mixed gravel; strongly effervescence; moderately alkaline; gradual smooth boundary.

Bk2—41 to 80 inches; light reddish brown (5YR 6/4) clay, reddish brown (5YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, very sticky, very plastic; 2 percent fine calcium carbonate filaments; 2 percent subrounded indurated mixed gravel; violently effervescence; moderately alkaline.

Range in Characteristics

Depth to cambic horizon: 5 to 10 inches
Depth to secondary carbonates: 20 to 40 inches
Particle-size control section (weighted average):
  Clay content: 35 to 50 percent
  Calcium carbonate equivalent: 0 to 15 percent

A or Ap horizons

Hue: 5YR or 7.5YR
Value: 4 to 6 dry, 3 or 4 moist
Chroma: 3 or 4, dry or moist
Texture: Silty clay loam, clay loam, or clay
Rock fragments: 0 to 3 percent gravel
Effervescence: Slightly to strongly
Reaction: Slightly alkaline or moderately alkaline

Bw horizon

Hue: 5YR or 7.5YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 to 6, dry or moist
Texture: Silty clay loam, clay loam, silty clay, or clay
Rock fragments: 0 to 3 percent gravel

Effervescence: Slightly to strongly
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 5YR or 7.5YR
Value: 4 to 6 dry, 3 to 6 moist
Chroma: 4 to 6, dry or moist
Texture: Clay loam, silty clay, or clay
Rock fragments: 0 to 10 percent gravel
Effervescence: Slightly to violently
Reaction: Moderately alkaline

Monahans Series

Map unit(s): MHA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Fan skirts on fan piedmonts
Parent material: Calcareous and gypsiferous loamy alluvium
Elevation: 3,000 to 4,000 feet
Slope: 0 to 2 percent
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Taxonomic Class

Coarse-loamy, mixed, superactive, thermic Typic Calcigypsids

Typical Pedon

Monahans fine sand in an area of map unit MHA—Monahans fine sandy loam, 0 to 2 percent slopes; Outlaw Spring, Texas USGS topographic quadrangle; Latitude: 31 degrees, 54 minutes, 32.27 seconds North and Longitude: 104 degrees, 17 minutes, 47.01 seconds West. UTM Easting: 566526 meters, UTM Northing: 3530561 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 2 inches; light brown (7.5YR 6/3) fine sand, brown (7.5YR 4/4) moist; weak coarse subangular blocky structure parting to weak medium platy; moderately hard, firm, slightly sticky, slightly plastic; common very fine roots; 1 percent subangular, strongly cemented limestone gravel; strongly effervescence; moderately alkaline; clear smooth boundary.

Bw—2 to 6 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to weak medium platy; moderately hard, firm, slightly sticky, slightly plastic; common very fine roots; 1 percent subangular, strongly cemented limestone gravel; strongly effervescence; moderately alkaline; clear smooth boundary.

Bk—6 to 16 inches; light olive brown (2.5Y 5/4) fine sandy loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure parting to weak medium platy, moderately hard, firm, slightly sticky, slightly plastic; many very fine, common fine, and common medium roots; 5 percent coarse distinct white (10YR 8/1) dry carbonate masses; 1 percent subangular strongly cemented limestone gravel; violently effervescence; moderately alkaline; clear smooth boundary.

By—16 to 80 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; moderately hard, firm,

nonsticky, slightly plastic; common very fine, common fine, and common medium roots; 10 percent fine distinct gypsum masses with diffuse boundaries; strongly effervescence; moderately alkaline.

Range in Characteristics

Depth to calcic horizon: 2 to 20 inches
Depth to gypsic horizon: 20 to 36 inches
Reaction: Slightly alkaline or moderately alkaline
Particle-size control section (weighted average):
Clay content: 6 to 18 percent
Effervescence: Strongly or violently

A horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: Fine sand, fine sandy loam, very fine sandy loam, or loam
Rock fragments: 0 to 10 percent

Bw horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 3 or 4, dry or moist
Texture: Very fine sandy loam, fine sandy loam, or loam
Rock fragments: 0 to 10 percent

Bk horizon

Hue: 7.5YR to 2.5Y
Value: 4 to 7, dry or moist
Chroma: 3 to 6, dry or moist
Texture: Very fine sandy loam, fine sandy loam, or loam
Rock fragments: 0 to 10 percent
Calcium carbonate equivalent: 15 to 40 percent

By horizon

Hue: 7.5YR or 10YR
Value: 4 to 8, dry or moist
Chroma: 2 to 6, dry or moist
Texture: Fine sandy loam or loam
Rock fragments: 0 to 10 percent
Calcium carbonate equivalent: 15 to 40 percent
Gypsum content: 15 to 30 percent

Neimahr Series

Map unit(s): DNB
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Alluvial flats
Parent material: Alluvium weathered from rock gypsum and sandstone
Elevation: 4,000 to 5,500 feet
Slope: 1 to 3 percent
Mean annual precipitation: 12 to 16 inches

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

Taxonomic Class

Loamy, mixed, superactive, thermic Lithic Ustic Haplocambids

Typical Pedon

Neimahr very fine sandy loam in an area of map unit DNB—Dellahunt-Neimahr-Joberanch complex, 1 to 3 percent slopes; KC Ranch, Texas USGS topographic quadrangle; Latitude: 31 degrees, 34 minutes, 44.55 seconds North and Longitude: 104 degrees, 25 minutes, 29.45 seconds West. UTM Easting: 554618 meters, UTM Northing: 3493905 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 5 inches; brown (10YR 5/3) very fine sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky, moderately plastic; few fine roots; strongly effervescence; neutral; clear smooth boundary.

Bw—5 to 10 inches; very pale brown (10YR 7/3) clay loam, pale brown (10YR 6/3) moist; strong medium subangular blocky structure parting to moderate fine subangular blocky; slightly hard, very friable, moderately sticky, moderately plastic; few fine roots; strongly effervescence; slightly alkaline; clear smooth boundary.

Bk—10 to 17 inches; very pale brown (10YR 7/4) clay loam, light yellowish brown (10YR 6/4) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; slightly hard, very friable, moderately sticky, moderately plastic; very few fine roots; 2 percent prominent carbonate coats on rock fragments and 7 percent faint carbonate coats on ped faces; 2 percent subrounded fine gyprock gravel; strongly effervescence; slightly alkaline; very abrupt smooth boundary.

R—17 to 27 inches; gypsum bedrock; indurated; few fine roots in mat at top of horizon; slightly alkaline.

Range in Characteristics

Depth to cambic horizon: 3 to 8 inches
Depth to secondary carbonates: 5 to 10 inches
Depth to lithic contact: 8 to 20 inches
Effervescence: Strongly or violently
Particle-size control section (weighted average):
Clay content: 15 to 35 percent

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry; 3 to 5 moist
Chroma: 2 to 5, dry or moist
Texture: Very fine sandy loam, loam, silty clay loam, or clay loam
Reaction: Neutral to slightly alkaline

Bw horizon

Hue: 7.5YR or 10YR
Value: 4 to 8 dry; 3 to 6 moist
Chroma: 2 to 5, dry or moist
Texture: Loam, silt loam, silty clay loam, or clay loam
Reaction: Neutral to slightly alkaline

Bk horizon

Hue: 10YR or 2.5Y
Value: 4 to 8 dry, 2 to 6 moist

Chroma: 3 to 5, dry or moist
Texture: Loam, silt loam, silty clay loam, or clay loam
Reaction: Neutral to slightly alkaline

R layer

Bedrock kind: Rock gypsum bedrock

Ojinaga Series

Map unit(s): OCB, OCF
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Fan remnants
Parent material: Gravelly alluvium derived from mixed sources
Elevation: 3,000 to 4,000 feet
Slope: 1 to 5 percent
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, hyperthermic, shallow Calcic Petrocalcids

Typical Pedon

Ojinaga gravelly loam in an area of map unit OCB—Ojinaga-Corazones complex, 1 to 5 percent slopes; Hudspeth County, Neely Canyon, Texas topographic quadrangle; Latitude: 31 degrees, 2 minutes, 21.40 seconds North and Longitude:105 degrees, 31 minutes, 0.20 seconds West. UTM Easting: 450691 meters, UTM Northing: 3434068 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 3 inches; very pale brown (10YR 7/4) gravelly loam, yellowish brown (10YR 5/4) moist; weak medium platy structure parting to weak fine and medium subangular blocky; soft, very friable, slightly sticky, slightly plastic; 40 percent carbonate coats on rock fragments; 1 percent subrounded indurated limestone cobbles and 9 percent subrounded, strongly cemented petrocalcic gravel, and 15 percent angular, indurated igneous gravel; violently effervescence; moderately alkaline; clear smooth boundary.

Bk—3 to 10 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 75 percent prominent carbonate coats on rock fragments; 10 percent medium strongly cemented carbonate masses on bottom of rock fragments; 1 percent subangular, very weakly cemented limestone boulders, 2 percent angular, indurated limestone cobbles, 20 percent subrounded indurated limestone gravels, 36 percent subrounded very strongly cemented petrocalcic gravels; violently effervescence; moderately alkaline; very abrupt smooth boundary.

Bkkm—10 to 20 inches; white (10YR 8/1) strongly cemented material; strongly effervescence; moderately alkaline.

Range in Characteristics

Depth to calcic horizon: 2 to 6 inches
Depth to petrocalcic horizon: 6 to 20 inches
Reaction: Moderately alkaline
Particle-size control section (weighted average):
Clay content: 16 to 28 percent

A horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy loam, loam, or sandy clay loam
Rock fragments: 15 to 60 percent with 15 to 54 percent gravel, 0 to 6 percent cobbles
Calcium carbonate equivalent: 2 to 15 percent
Effervescence: Strongly or violently

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 or sandy clay loam
Rock fragments: 35 to 75 percent with 35 to 70 percent gravel, 0 to 7 percent cobbles, 0 to 3 percent stones
Calcium carbonate equivalent: 5 to 40 percent
Effervescence: Strongly or violently

Bkkm horizon

Cementation: Strongly cemented to indurated

Pantak Series

Map unit(s): LPG, PAG
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Hills
Parent material: Residuum weathered from igneous rock and/or colluvium derived from igneous rock
Elevation: 4,000 to 5,500 feet
Slope: 10 to 60 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplargids

Typical Pedon

Pantak very gravelly coarse sandy loam in an area of map unit PAG—Pantak-Rock outcrop complex, 20 to 70 percent slopes; Chispa Mountain NW, Texas USGS topographic quadrangle; Latitude: 30 degrees, 53 minutes, 56.10 seconds North and Longitude: 104 degrees, 41 minutes, 21.00 seconds West. UTM Easting: 529705 meters, UTM Northing: 3418441 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 4 inches; brown (7.5YR 5/3) very gravelly coarse sandy loam, brown (7.5YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; 10 percent angular, indurated igneous cobbles, and 30 percent subangular indurated mixed rock gravel; noneffervescent; neutral; clear smooth boundary.

Bt—4 to 8 inches; brown (7.5YR 4/3) very cobbly sandy clay loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; 30 percent distinct clay films on all faces of peds; 20 percent angular, indurated igneous cobbles, and 30 percent subangular indurated mixed rock gravel; noneffervescent; neutral; very abrupt smooth boundary.

R—8 to 18 inches, indurated igneous bedrock.

Range in Characteristics

Depth to argillic horizon: 3 to 5 inches
Depth to lithic contact: 6 to 20 inches
Effervescence: Noneffervescent
Reaction: Slightly acid to slightly alkaline
Particle-size control section (weighted average):
Clay content: 15 to 35 percent
Calcium carbonate equivalent: 0 to 5 percent

A horizon

Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sandy loam, sandy loam, fine sandy loam, loam, or sandy clay loam
Rock fragments: 35 to 65 percent with 35 to 55 percent gravel, 0 to 10 percent cobbles

Bt horizon

Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 to 3 moist
Chroma: 2 to 4, dry or moist
Texture: Sandy clay loam or clay loam
Rock fragments: 45 to 75 percent with 25 to 40 percent gravel, 20 to 35 percent cobbles

R layer

Bedrock kind: Igneous bedrock

Pantera Series

Map unit(s): PRA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Landform: Arroyos
Parent material: Sandy and gravelly alluvium derived from igneous and sedimentary rock
Elevation: 3,000 to 4,000 feet
Slope: 0 to 2 percent
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 68 to 72 degrees F
Frost-free period: 240 to 280 days

Taxonomic Class

Sandy-skeletal, mixed, hyperthermic Ustic Torrifluvents

Typical Pedon

Pantera gravelly loamy coarse sand in an area of map unit PRA—Pantera-Riverwash complex, 0 to 2 percent slopes, frequently flooded; Hudspeth County, Eagle Mountains SW, Texas USGS topographic quadrangle; Latitude: 30 degrees, 51 minutes, 4.21

seconds North and Longitude: 105 degrees, 12 minutes, 57.38 seconds West. UTM Easting: 479353 meters, UTM Northing: 3413128 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 3 inches; brown (7.5YR 5/4) gravelly loamy coarse sand, brown (7.5YR 5/3) moist; single grain; loose, loose, nonsticky, nonplastic; 15 percent subrounded indurated sedimentary rock gravel; strongly effervescence; moderately alkaline; clear smooth boundary.

C1—3 to 20 inches; brown (7.5YR 5/4) very gravelly coarse sand, brown (7.5YR 5/3) moist; single grain; loose, loose, nonsticky, nonplastic; 40 percent subangular indurated sedimentary rock gravel; strongly effervescence; moderately alkaline; gradual smooth boundary.

C2—20 to 80 inches; brown (7.5YR 5/4) extremely gravelly coarse sand, brown (7.5YR 5/3) moist; single grain; loose, loose, nonsticky, nonplastic; 75 percent subangular indurated sedimentary rock gravel; strongly effervescence; moderately alkaline.

Range in Characteristics

Reaction: Moderately alkaline
Particle-size control section (weighted average):
Clay content: 2 to 10 percent
Calcium carbonate equivalent: 2 to 10 percent

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Coarse sand, sand, loamy coarse sand, or loamy sand
Rock fragments: 15 to 60 percent with 15 to 45 percent gravel, 0 to 15 cobbles
Effervescence: Slightly or strongly

C horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Coarse sand, sand, loamy coarse sand, or loamy sand
Rock fragments: 35 to 80 percent with 35 to 55 percent gravel, 0 to 20 percent cobbles, 0 to 5 percent stones
Effervescence: Slightly or strongly

Peligro Series

Map unit(s): CTC
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Relict stabilized gypsum dunes
Parent material: Gypsiferous sandy eolian deposits
Elevation: 3,000 to 4,000 feet
Slope: 1 to 8 percent
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Taxonomic Class

Coarse-gypseous, hypergypsic, thermic Leptic Haplogypsids

Typical Pedon

Peligro fine sandy loam in an area of map unit CTC—Corvus-Peligro-Yesum complex, 1 to 8 percent slopes; Hudspeth County, Linda Lake North, Texas USGS topographic quadrangle; Latitude: 31 degrees, 59 minutes, 42.35 seconds North and Longitude: 105 degrees, 2 minutes, 39.16 seconds West. UTM Easting: 495824 meters, UTM Northing: 3539893 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Ay—0 to 1 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak fine granular structure parting to weak medium platy; slightly hard, friable, nonsticky, nonplastic; 5 percent fine distinct gypsum masses; strongly effervescence; moderately alkaline; clear broken boundary.

Byy1—1 to 7 inches; white (10YR 8/1) gypsiferous coarse sand, very pale brown (10YR 7/3) moist; moderate coarse subangular blocky structure; very hard, extremely firm, nonsticky, nonplastic; 60 percent fine prominent platy extremely weakly cemented gypsum masses with clear boundaries; slightly effervescence; moderately alkaline; gradual wavy boundary.

Byy2—7 to 24 inches; white (10YR 8/1) gypsiferous coarse sand, very pale brown (10YR 7/3) moist; massive; moderately hard, firm, extremely weakly, nonsticky, nonplastic; 90 percent fine prominent extremely weakly cemented gypsum masses; slightly effervescence; moderately alkaline; diffuse wavy boundary.

Byy3—24 to 36 inches; very pale brown (10YR 8/2) gypsiferous coarse sand, light gray (10YR 7/2) moist; massive; slightly hard, friable, extremely weakly, nonsticky, nonplastic; 80 percent fine prominent extremely weakly cemented gypsum masses; slightly effervescence; moderately alkaline; diffuse wavy boundary.

Byy4—36 to 80 inches; white (10YR 8/1) gypsiferous coarse sand, very pale brown (10YR 8/3) moist; massive; slightly hard, friable, extremely weakly, nonsticky, nonplastic; 80 percent fine prominent extremely weakly cemented gypsum masses; slightly effervescence; moderately alkaline.

Range in Characteristics

Depth to hypergypsic horizon: 0 to 3 inches
Other features: Pedons have 50 percent or more (by weight) particles with diameters of 0.1 to 2.0 mm

Ay horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 to 4, dry or moist
Texture: Fine sandy loam
Gypsum content: 1 to 10 percent
Calcium carbonate equivalent: 1 to 10 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Byy horizon

Hue: 10YR or 2.5Y
Value: 7 to 8 dry, 6 to 8 moist
Chroma: 1 to 4, dry or moist
Texture: Gypsiferous coarse sand or gypsiferous sand
Gypsum content: 70 to 90 percent
Calcium carbonate equivalent: 1 to 7 percent

Effervescence: Slightly or strongly
Reaction: Moderately alkaline

Perilla Series

Map unit(s): KPB
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Interdunes on alluvial flats
Parent material: Loamy alluvium derived from igneous and sedimentary rock
Elevation: 4,000 to 5,500 feet
Slope: 1 to 5 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Coarse-loamy, mixed, superactive, thermic Ustic Haplocambids

Typical Pedon

Perilla fine sandy loam in an area of map unit KPB—Kinco-Aguena-Perilla complex, 1 to 5 percent slopes; Plateau, Texas USGS topographic quadrangle; Latitude: 31 degrees, 5 minutes, 10.35 seconds North and Longitude: 104 degrees, 35 minutes, 28.85 seconds West. UTM Easting: 538978 meters, UTM Northing: 3439228 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 16 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; noneffervescent; slightly alkaline; clear smooth boundary.

Bw1—16 to 25 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; noneffervescent; slightly alkaline; clear smooth boundary.

Bw2—25 to 37 inches; reddish brown (5YR 5/4) loamy sand, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; 1 percent fine threadlike carbonate masses with clear boundaries; slightly effervescence; slightly alkaline; clear smooth boundary.

Bk1—37 to 51 inches; brown (7.5YR 5/4) coarse sandy loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; 3 percent medium carbonate masses with clear boundaries; strongly effervescence; moderately alkaline; clear smooth boundary.

Bk2—51 to 71 inches; light brown (7.5YR 6/4) loamy fine sand, brown (7.5YR 5/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; 5 percent medium carbonate masses with clear boundaries and 2 percent medium strongly cemented carbonate nodules with clear boundaries; strongly effervescence; moderately alkaline; clear smooth boundary.

Bk3—71 to 80 inches; light brown (7.5YR 6/3) fine sandy loam, brown (7.5YR 5/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; 5 percent medium strongly cemented carbonate nodules with clear boundaries and 10 percent coarse carbonate masses with clear boundaries; strongly effervescence; moderately alkaline.

Range in Characteristics

Depth to cambic horizon: 4 to 16 inches

Depth to secondary carbonates: 25 to 30 inches
Particle-size control section (weighted average):
Calcium carbonate equivalent: 2 to 10 percent
Clay content: 10 to 18 percent

A horizon

Hue: 5YR or 7.5YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Loamy fine sand, sandy loam, or fine sandy loam
Calcium carbonate equivalent: 2 to 10 percent
Effervescence: None or slightly
Reaction: Slightly alkaline

Bw horizon

Hue: 5YR or 7.5YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 3 to 6, dry or moist
Texture: Loamy sand, sandy loam, fine sandy loam, or loam
Calcium carbonate equivalent: 2 to 10 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline

Bk horizon

Hue: 7.5YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 3 to 6, dry or moist
Texture: Loamy sand, loamy fine sand, coarse sandy loam, sandy loam, fine sandy loam, or loam
Calcium carbonate equivalent: 2 to 10 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Pokorny Series

Map unit(s): EPA, EPE, HPC
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Alluvial flats, terraces
Parent material: Gypsiferous alluvium
Elevation: 4,000 to 5,500 feet
Slope: 0 to 8 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine-gypseous, hypergypsic, thermic, shallow Ustic Petrogypsids

Typical Pedon

Pokorny loam in an area of map unit EPA—Elcor-Dellahunt-Pokorny complex, 0 to 2 percent slopes; Castle Hill, Texas USGS topographic quadrangle; Latitude: 31 degrees, 52 minutes, 7.2 seconds North and Longitude: 104 degrees, 19 minutes, 50.30 seconds

West. UTM Easting: 563315 meters, UTM Northing: 3526073 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 1 inches; yellowish brown (10YR 5/4) loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, slightly sticky, slightly plastic; common very fine and fine roots; 2 percent very coarse prominent irregular insect casts; 1 percent medium distinct platy moderately cemented carbonate nodules; strongly effervescence; slightly alkaline; clear smooth boundary.

Byy1—1 to 6 inches; white (10YR 8/1) gypsiferous silt loam, white (10YR 8/1) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; slightly hard, friable, slightly sticky, moderately plastic; common very fine, fine, and medium roots; slightly effervescence; slightly alkaline; gradual smooth boundary.

Byy2—6 to 17 inches; white (10YR 8/1) gypsiferous silty clay loam, pale yellow (2.5Y 8/2) moist; moderate coarse prismatic structure; slightly hard, friable, very sticky, moderately plastic; brittle; common very fine, fine and medium roots in cracks; 2 percent prominent carbonate coats on vertical faces of peds; slightly effervescence; moderately alkaline; abrupt smooth boundary.

Byym1—17 to 28 inches; very pale brown (10YR 8/3) gypsiferous cemented material, light yellowish brown (10YR 6/4) moist; strong coarse prismatic structure; moderately cemented, moderately sticky, slightly plastic; brittle; common very fine and fine roots in cracks; common medium roots at top of horizon; 2 percent prominent carbonate coats on vertical prism faces; strongly effervescence; moderately alkaline; clear smooth boundary.

Byym2—28 to 37 inches; white (10YR 8/1) gypsiferous cemented material, pale yellow (2.5Y 8/3) moist; strong coarse prismatic structure; moderately cemented, moderately sticky, moderately plastic; brittle; few very fine and fine roots in cracks; 2 percent prominent carbonate coats on vertical prism faces; strongly effervescence; moderately alkaline; clear smooth boundary.

Byym3—37 to 52 inches; white (10YR 8/1) gypsiferous cemented material, pale yellow (2.5Y 8/3) moist; strong coarse prismatic structure; weakly cemented, slightly sticky, slightly plastic; brittle; few very fine and fine roots in cracks; 2 percent prominent carbonate coats on vertical faces of peds; strongly effervescence; moderately alkaline; clear smooth boundary.

Byym4—52 to 80 inches; white (10YR 8/1) gypsiferous cemented material, pale yellow (2.5Y 8/3) moist; strong coarse prismatic structure; weakly cemented, slightly sticky, nonplastic; brittle; few very fine and fine roots in cracks; 2 percent prominent carbonate coats on vertical faces of peds; strongly effervescence; moderately alkaline.

Range in Characteristics

Depth to hypergypsic horizon: 0 to 4 inches
Depth to petrogypsic horizon: 4 to 20 inches

A horizon

Hue: 10YR or 2.5Y
Value: 5 to 8 dry, 4 to 7 moist
Chroma: 1 to 4, dry or moist
Texture: Sandy loam, fine sandy loam, loam, or silty clay loam
Clay content: 10 to 28 percent
Calcium carbonate equivalent: 10 to 20 percent
Gypsum content: 0 to 10 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Byy horizon

Hue: 10YR or 2.5Y

Value: 7 or 8, dry or moist
Chroma: 1 to 3, dry or moist
Texture: Gypsiferous fine sandy loam, gypsiferous loam, gypsiferous clay loam, gypsiferous silt loam, or gypsiferous silty clay loam
Calcium carbonate equivalent: 1 to 5 percent
Gypsum content: 80 to 95 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Byym horizon

Cementation: Extremely weakly to strongly

Reyab Series

Map unit(s): RLA, RSA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Flood plains
Parent material: Loamy alluvium derived from igneous and sedimentary rock
Elevation: 4,000 to 5,500 feet
Slope: 0 to 2 percent
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 60 to 67 degrees F
Frost-free period: 200 to 250 days

Taxonomic Class

Fine-silty, mixed, superactive, thermic Ustic Haplocambids

Typical Pedon

Reyab silt loam in an area of map unit RSA—Reyab silt loam, 0 to 2 percent slopes, occasionally flooded; Seven Heart Gap, Texas USGS topographic quadrangle; Latitude: 31 degrees, 16 minutes, 17.57 seconds North and Longitude: 104 degrees, 33 minutes, 0.03 seconds West. UTM Easting: 542837 meters, UTM Northing: 3459784 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 3 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, slightly sticky, slightly plastic; common very fine and many fine roots; strongly effervescence; moderately alkaline; clear smooth boundary.

Bw1—3 to 13 inches; brown (7.5YR 5/3) silt loam, brown (7.5YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, moderately sticky, moderately plastic; common very fine and common fine roots; common fine moderate continuity vesicular pores; strongly effervescence; moderately alkaline; gradual wavy boundary.

Bw2—13 to 24 inches; brown (7.5YR 5/3) silty clay loam, brown (7.5YR 4/3) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, moderately sticky, moderately plastic; few medium roots and common fine roots; few very fine moderate continuity vesicular pores; strongly effervescence; moderately alkaline; gradual wavy boundary.

Bw3—24 to 31 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, moderately sticky, moderately plastic; common very fine roots and few coarse roots; common very fine moderate continuity vesicular pores; strongly effervescence; moderately alkaline; gradual wavy boundary.

Bk1—31 to 42 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky, moderately plastic; few very fine and few fine roots; common fine moderate continuity vesicular pores; 4 percent fine distinct carbonate masses with clear boundaries and 3 percent medium distinct carbonate masses with clear boundaries; violently effervescence; moderately alkaline; gradual wavy boundary.

Bk2—42 to 53 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky, moderately plastic; few fine roots; common fine moderate continuity vesicular pores; 2 percent fine distinct carbonate masses with clear boundaries and 2 percent medium distinct carbonate masses with clear boundaries; violently effervescence; moderately alkaline; gradual wavy boundary.

Bk3—53 to 72 inches; light brown (7.5YR 6/3) clay loam, brown (7.5YR 5/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky, moderately plastic; few very fine roots; few very fine moderate continuity vesicular pores; 1 percent fine distinct carbonate masses with clear boundaries; violently effervescence; moderately alkaline; gradual wavy boundary.

Bk4—72 to 80 inches; light brown (7.5YR 6/3) loam, brown (7.5YR 5/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky, moderately plastic; few very fine roots; few very fine moderate continuity vesicular pores; carbonate, finely disseminated, and 1 percent fine faint carbonate masses with clear boundaries; violently effervescence; moderately alkaline.

Range in Characteristics

Depth to cambic horizon: 3 to 20 inches
Depth to secondary carbonates: 12 to 35 inches
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline
Particle-size control section (weighted average):
Clay content: 18 to 35 percent
Calcium carbonate equivalent: 0 to 14 percent

A horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4 dry or moist
Texture: Silt loam, loam, or silty clay loam

Bw horizon

Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4 dry or moist
Texture: Silt loam, loam, silty clay loam, or clay loam

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 7 dry or moist
Chroma: 2 to 4 dry or moist
Texture: Silt loam, silty clay loam, loam, or clay loam

Stovall Series

Map unit(s): STB
Depth class: Very deep
Drainage class: Well drained
Slowest soil permeability to 60 inches: 0.6 to 2.0 in/hr (moderate)
Landform: Alluvial flats
Parent material: Loamy alluvium derived from igneous and sedimentary rock
Elevation: 4,000 to 5,500 feet
Slope: 0 to 3 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine-silty, mixed, superactive, thermic Ustic Haplocalcids

Typical Pedon

Stovall clay loam in an area of map unit STB—Stovall clay loam, 0 to 3 percent slopes; Hopper Draw West, Texas USGS topographic quadrangle; Latitude: 31 degrees, 15 minutes, 53.98 seconds North and Longitude: 104 degrees, 18 minutes, 39.29 seconds West. UTM Easting: 538963 meters, UTM Northing: 3439819 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 12 inches; yellowish brown (10YR 5/4) clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; few fine roots; strongly effervescence; slightly alkaline; gradual boundary.

Bw—12 to 23 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; few fine roots; strongly effervescence; moderately alkaline; clear boundary.

Bk1—23 to 37 inches; light brown (7.5YR 6/4) silt loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 6 percent fine distinct carbonate masses with clear boundaries; strongly effervescence; moderately alkaline; gradual boundary.

Bk2—37 to 61 inches; strong brown (7.5YR 5/6) silt loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; moderately hard, firm, slightly sticky, slightly plastic; 11 percent fine distinct carbonate masses with clear boundaries; strongly effervescence; moderately alkaline; gradual boundary.

Bk3—61 to 80 inches; strong brown (7.5YR 5/6), silt loam, strong brown (7.5YR 4/6) moist; moderate fine subangular blocky structure; moderately hard, firm, slightly sticky, slightly plastic; 15 percent fine distinct carbonate masses with clear boundaries; violently effervescence; moderately alkaline.

Range in Characteristics

Depth to cambic horizon: 4 to 12 inches
Depth to calcic horizon: 12 to 34 inches
Rock fragments: 0 to 10 percent limestone and caliche
Calcium carbonate equivalent: 20 to 40 percent
Reaction: Slightly alkaline or moderately alkaline
Particle-size control section (weighted average):
Clay content: 22 to 35 percent

A horizon

Hue: 7.5YR or 10YR

Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Silt loam, loam, silty clay loam, or clay loam
Calcium carbonate equivalent: 15 to 25 percent
Effervescence: Slightly to strongly

Bw horizon

Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: Silt loam, loam, silty clay loam, or clay loam
Calcium carbonate equivalent: 15 to 30 percent
Effervescence: Slightly to strongly

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 to 8, dry or moist
Chroma: 2 to 6, dry or moist
Texture: Silt loam, loam, silty clay loam, or clay loam
Calcium carbonate equivalent: 20 to 35 percent
Effervescence: Strongly to violently

Tenneco Series

Map unit(s): BED, CPC, TEC
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Fan piedmonts, alluvial fans
Parent material: Loamy alluvium derived from mixed sources
Elevation: 4,000 to 5,500 feet
Slope: 1 to 16 percent
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 60 to 67 degrees F
Frost-free period: 200 to 250 days

Taxonomic Class

Fine-loamy, mixed, superactive, thermic Ustic Haplocambids

Typical Pedon

Tenneco loam in an area of map unit CPC—Chispa-Tenneco complex, 0 to 8 percent slopes; Hudspeth County, Gunsight Hills South, Texas USGS topographic quadrangle; Latitude: 31 degrees, 22 minutes, 17.77 seconds North and Longitude: 105 degrees, 26 minutes, 2.43 seconds West. UTM Easting: 458728 meters, UTM Northing: 3470867 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 6 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; strongly effervescence; moderately alkaline; clear smooth boundary.

Bw1—6 to 12 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; strongly effervescence; moderately alkaline; clear smooth boundary.

Bw2—12 to 31 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable,

slightly sticky, slightly plastic; strongly effervescence; moderately alkaline; clear smooth boundary.

Bk1—31 to 43 inches; brownish yellow (10YR 6/6) clay loam, dark yellowish brown (10YR 4/6) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 3 percent fine faint carbonate masses with clear boundaries; violently effervescence; moderately alkaline; clear smooth boundary.

Bk2—43 to 80 inches; light yellowish brown (10YR 6/4) loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; 15 percent fine distinct carbonate masses with clear boundaries; 4 percent subrounded indurated limestone gravel; violently effervescence; moderately alkaline.

Range in Characteristics

Depth to cambic horizon: 4 to 16 inches
Depth to secondary carbonates: 7 to 31 inches
Particle-size control section (weighted average):
Clay content: 24 to 35 percent
Rock fragments: 0 to 5 percent gravels

A horizon

Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: Loam or silt loam
Clay content: 12 to 27 percent
Calcium carbonate equivalent: 0 to 3 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Bw horizon

Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: Loam, sandy clay loam, or clay loam
Clay content: 24 to 35 percent
Calcium carbonate equivalent: 1 to 5 percent
Effervescence: Slightly or strongly
Reaction: Moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 8 moist
Chroma: 1 to 6, dry or moist
Texture: Loam, sandy clay loam, clay loam, or silt loam
Clay content: 15 to 35 percent
Calcium carbonate equivalent: 3 to 10 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Verhalen Series

Map unit(s): VDA
Depth class: Very deep
Drainage class: Moderately well drained

Slowest permeability: 0.001 to 0.06 in/hr (very slow)
Landform: Basin floors
Parent material: Clayey alluvium
Elevation: 4,000 to 5,500 feet
Slope: 0 to 1 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine, smectitic, thermic Typic Haplotorrerts

Typical Pedon

Verhalen silty clay in an area of map unit VDA—Verhalen-Dalby association, 0 to 1 percent slopes, rarely flooded; Lobo, Texas USGS topographic quadrangle; Latitude: 30 degrees, 50 minutes, 51.39 seconds North and Longitude: 104 degrees, 46 minutes, 45.50 seconds West. UTM Easting: 521102 meters, UTM Northing: 3412734 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; strong medium angular blocky structure; hard, very firm, very sticky, very plastic; very slightly effervescence; neutral; clear smooth boundary.

Bss1—8 to 27 inches; dark yellowish brown (10YR 3/4) clay, very dark grayish brown (10YR 3/2) moist; strong medium angular blocky structure; hard, very firm, very sticky, very plastic; 65 percent prominent slickensides (pedogenic) on vertical faces of peds; very slightly effervescence; slightly alkaline; clear smooth boundary.

Bss2—27 to 80 inches; dark yellowish brown (10YR 3/4) clay, dark brown (10YR 3/3) moist; strong medium angular blocky structure; hard, very firm, very sticky, very plastic; 75 percent prominent slickensides (pedogenic) on vertical faces of peds; very slightly effervescence; moderately alkaline.

Range in Characteristics

Particle-size control section (weighted average):
Clay content: 45 to 60 percent
Rock fragments: 0 to 2 percent

Ap horizon

Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2.5 to 3 moist
Chroma: 2 or 3 dry or moist
Texture: Clay loam, silty clay loam, silty clay, or clay
Clay content: 42 to 53 percent
Calcium carbonate equivalent: 0 to 3 percent
Effervescence: None or slightly
Reaction: Neutral to moderately alkaline

Bss horizon

Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 3 or 4 moist
Chroma: 2 to 4, dry or moist
Texture: Silty clay or clay
Clay content: 45 to 60 percent
Calcium carbonate equivalent: 5 to 35 percent
Effervescence: Very slightly or slightly
Reaction: Neutral to moderately alkaline

Walkerwells Series

Map unit(s): EPE, WAB
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Landform: Flood plains, drainageways
Parent material: Loamy alluvium derived from rock gypsum and/or loamy alluvium derived from sandstone
Elevation: 4,000 to 5,500 feet
Slope: 0 to 3 percent
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 210 to 250 days

Taxonomic Class

Fine-silty, mixed, superactive, thermic Ustifluventic Haplocambids

Typical Pedon

Walkerwells silty clay loam in an area of map unit WAB—Walkerwells silty clay loam, 0 to 3 percent slopes, occasionally flooded; Two Mill Draw East, Texas USGS topographic quadrangle; Latitude: 31 degrees, 31 minutes, 57.35 seconds North and Longitude: 104 degrees, 14 minutes, 30.75 seconds West. UTM Easting: 571971 meters, UTM Northing: 3488878 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A1—0 to 6 inches; 70 percent light brownish gray (10YR 6/2) silty clay loam, very dark grayish brown (10YR 3/ 2) moist; 30 percent very pale brown (10YR 7/3), loam, light yellowish brown (10YR 6/4) moist; weak fine and medium subangular blocky structure; soft, friable, slightly sticky, nonplastic; common fine and medium roots; violently effervescence; moderately alkaline; clear smooth boundary.

A2—6 to 9 inches; 70 percent light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; 30 percent light brownish gray (10YR 6/2), silt loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium granular structure and strong fine granular structure; soft, friable, slightly sticky, slightly plastic; common fine and medium roots; violently effervescence; moderately alkaline; clear smooth boundary.

Ab1—9 to 15 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate medium and coarse subangular blocky structure; moderately hard, friable, slightly sticky, slightly plastic; common fine and medium roots; violently effervescence; moderately alkaline; clear smooth boundary.

Ab2—15 to 20 inches; light brownish gray (10YR 6/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; strong medium subangular blocky structure; moderately hard, friable, moderately sticky, slightly plastic; common fine and medium roots; violently effervescence; moderately alkaline; gradual smooth boundary.

Ab3—20 to 26 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; strong coarse subangular blocky structure; hard, firm, moderately sticky, slightly plastic; common fine and medium roots; violently effervescence; moderately alkaline; gradual smooth boundary.

Bwb1—26 to 39 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; strong fine prismatic structure parting to moderate medium and coarse subangular blocky; moderately hard, friable, moderately sticky, moderately plastic; common fine and medium roots; violently effervescence; moderately alkaline; clear smooth boundary.

Bwb2—39 to 50 inches; light yellowish brown (10YR 6/4) silty clay, dark yellowish brown (10YR 4/4) moist; moderate fine prismatic structure parting to strong fine subangular blocky; hard, firm, moderately sticky, moderately plastic; common fine and medium roots; 5 percent faint pressure faces on peds; 3 percent fine prominent spherical carbonate masses; violently effervescence; moderately alkaline; clear smooth boundary.

Bkyb—50 to 62 inches; yellowish brown (10YR 5/4) silty clay, dark yellowish brown (10YR 4/4) moist; moderate fine prismatic structure strong fine subangular blocky; hard, firm, moderately sticky, very plastic; common fine, medium, and coarse roots; 15 percent faint pressure faces on peds; 2 percent fine carbonate masses; 8 percent fine prominent threadlike gypsum masses; violently effervescence; moderately alkaline; clear smooth boundary.

Byb—62 to 80 inches; dark yellowish brown (10YR 4/4) silty clay, dark yellowish brown (10YR 3/4) moist; strong extremely coarse prismatic structure parting to weak fine and medium subangular blocky; moderately hard, friable, nonsticky, slightly plastic; common fine, medium and coarse roots; 40 percent fine gypsum masses; 10 percent fine prominent gypsum masses on vertical ped faces; strongly effervescence; strongly alkaline.

Range in Characteristics

Depth to gypsic horizon: 47 to 69 inches
Particle-size control section (weighted average):
Clay content: 25 to 35 percent

A or Ab horizons

Hue: 10YR
Value: 5 to 7 dry, 3 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: Very fine sandy loam, loam, silt loam, silty clay loam, or clay loam
Clay content: 15 to 38 percent
Calcium carbonate equivalent: 15 to 25 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

Bwb horizon

Hue: 10YR
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: Loam, silt loam, silty clay loam, silty clay, or clay loam
Clay content: 20 to 41 percent
Calcium carbonate equivalent: 15 to 30 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Bkb horizon (where present)

Hue: 10YR
Value: 6 or 7 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: Loam, silt loam, silty clay loam, or clay loam
Clay content: 20 to 35 percent
Calcium carbonate equivalent: 10 to 35 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Bkyb or Byb horizons

Hue: 10YR
Value: 4 to 8, dry, 3 to 7 moist
Chroma: 2 to 4, dry or moist
Texture: Silty clay, silty clay loam, or clay loam
Gypsum content: 1 to 40 percent
Calcium carbonate equivalent: 10 to 35 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline or strongly alkaline

Yarbam Series

Map unit(s): YAG
Depth class: Very shallow and shallow
Drainage class: Well drained
Slowest soil permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Mountain slopes
Parent material: Gravelly residuum weathered from limestone
Elevation: 5,500 to 7,500 feet
Slope: 35 to 65 percent
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Taxonomic Class

Loamy-skeletal, mixed, superactive, thermic Aridic Lithic Haplustolls

Typical Pedon

Yarbam very gravelly loam (fig. 34) in an area of map unit YAG—Yarbam-Rock outcrop complex, 35 to 65 percent slopes; Collier Mesa, Texas USGS topographic quadrangle; Latitude: 31 degrees, 15 minutes, 16.68 seconds North and Longitude: 104 degrees, 54 minutes, 14.47 seconds West. UTM Easting: 509139 meters, UTM Northing: 3457826 meters; UTM Zone 13. (Colors are for dry soil unless otherwise noted)

A—0 to 6 inches; brown (7.5YR 4/2) very gravelly loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; 3 percent fine distinct moderately cemented carbonate masses with clear boundaries around rock fragments; 4 percent subrounded indurated limestone cobbles, and 38 percent subrounded indurated limestone gravel; strongly effervescence; moderately alkaline; clear smooth boundary.

Bk—6 to 15 inches; brown (7.5YR 4/2) very gravelly loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; 8 percent fine distinct moderately cemented carbonate masses with clear boundaries around rock fragments; 6 percent subrounded indurated limestone cobbles, and 39 percent subrounded indurated limestone gravel; strongly effervescence; moderately alkaline; abrupt smooth boundary.

R—15 to 25 inches; indurated limestone bedrock.

Range in Characteristics

Depth to lithic contact: 8 to 20 inches
Particle-size control section (weighted average):
Clay content: 20 to 28 percent

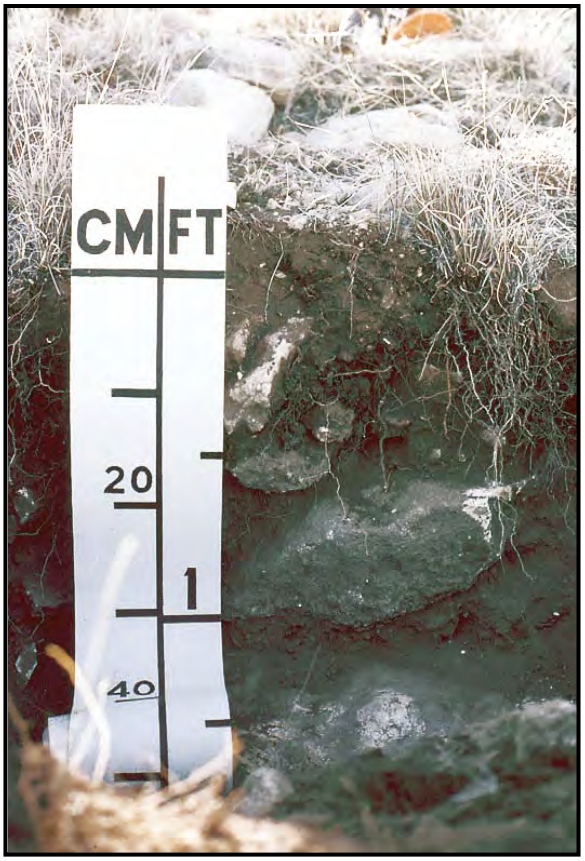

Figure 34.—Profile of Yarbam very gravelly loam, in an area of Yarbam-Rock outcrop complex, 35 to 65 percent slopes. The parent material is coarsely fractured limestone bedrock. (Scale in CM—Centimeters, FT—Feet)

A horizon

Hue: 7.5YR
Value: 4 dry, 3 moist
Chroma: 2 or 3, dry or moist
Texture: Sandy loam, silt loam, or loam
Rock fragments: 35 to 60 percent with 25 to 45 percent gravel, 0 to 15 percent cobbles
Calcium carbonate equivalent: 5 to 10 percent
Effervescence: Strongly or violently
Reaction: Slightly alkaline or moderately alkaline

Bk horizon

Hue: 7.5YR or 10YR
Value: 4 dry, 3 moist
Chroma: 2 or 3, dry or moist
Texture: Sandy loam, silt loam, or loam
Rock fragments: 35 to 60 percent with 25 to 45 percent gravel, 0 to 15 percent cobbles
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Strongly or violently
Reaction: Moderately alkaline

R layer

Bedrock kind: Limestone bedrock

Yesum Series

Map unit(s): YLA, CTC
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Alluvial flats, relict stabilized gypsum dunes
Parent material: Gypsiferous loamy alluvium and/or gypsiferous eolian deposits
Elevation: 3,000 to 4,000 feet
Slope: 0 to 8 percent
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 62 to 67 degrees F
Frost-free period: 200 to 240 days

Taxonomic Class

Coarse-gypseous, hypergypsic, thermic Leptic Haplogypsids

Typical Pedon

Yesum fine sandy loam in an area of map unit CTC—Corvus-Peligro-Yesum complex, 1 to 8 percent slopes; Hudspeth County, Linda Lake North, Texas USGS topographic quadrangle; Latitude: 31 degrees, 57 minutes, 36.01 seconds North and Longitude: 105 degrees, 2 minutes, 36.66 seconds West. UTM Easting: 495888 meters, UTM Northing: 3536003 meters, UTM Zone 13. (Colors are for dry soil unless otherwise noted)

Ay—0 to 2 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky, nonplastic; common very fine and fine roots; common very fine and fine dendritic tubular pores; 3 percent fine distinct threadlike carbonate masses with clear boundaries between peds; strongly effervescence; moderately alkaline; clear smooth boundary.

Bky—2 to 7 inches; very pale brown (10YR 7/3) coarse sandy loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky, nonplastic; many very fine and fine roots; common very fine dendritic tubular pores; 5 percent fine distinct strongly cemented gypsum masses with clear boundaries between peds; 5 percent coarse distinct moderately cemented carbonate concretions with diffuse boundaries between peds; strongly effervescence; moderately alkaline; gradual wavy boundary.

Bkyy1—7 to 20 inches; very pale brown (10YR 8/3) gypsiferous coarse sandy loam, very pale brown (10YR 7/4) moist; weak coarse and very coarse prismatic structure; hard, firm, nonsticky, nonplastic; common very fine and fine roots around fragments; common very fine and fine dendritic tubular pores; carbonate, finely disseminated; 50 percent fine distinct moderately cemented gypsum crystals with clear boundaries; strongly effervescence; slightly alkaline; gradual wavy boundary.

Bkyy2—20 to 51 inches; white (10YR 8/1) gypsiferous loam, very pale brown (10YR 7/4) moist; weak coarse and very coarse prismatic structure; hard, firm, nonsticky, nonplastic; few very fine roots in cracks; common very fine and fine irregular pores; carbonate, finely disseminated; 65 percent fine faint strongly cemented gypsum crystals with clear boundaries; strongly effervescence; moderately alkaline; diffuse wavy boundary.

Bkyy3—51 to 80 inches; white (10YR 8/1) gypsiferous coarse sandy loam, very pale brown (10YR 8/2) moist; weak coarse and very coarse prismatic structure; hard, firm, nonsticky, nonplastic; common very fine and fine irregular pores; carbonate, finely disseminated; 80 percent fine faint strongly cemented gypsum crystals with clear boundaries; strongly effervescence; moderately alkaline.

Range in Characteristics

Depth to hypergypsic horizon: 0 to 7 inches

Ay horizon

Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: Loamy very fine sand, fine sandy loam, very fine sandy loam, silt loam, or loam
Clay content: 10 to 17 percent
Calcium carbonate equivalent: 3 to 5 percent
Gypsum content: 1 to 10 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Bky horizon

Hue: 7.5YR or 10YR
Value: 5 to 8 dry, 4 to 8 moist
Chroma: 1 to 4, dry or moist
Texture: Loamy very fine sand, coarse sandy loam, fine sandy loam, very fine sandy loam, or loam
Clay content: 5 to 26 percent
Calcium carbonate equivalent: 3 to 15 percent
Gypsum content: 5 to 40 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Bkyy or Byy horizons

Hue: 7.5YR or 10YR
Value: 5 to 8 dry, 4 to 8 moist
Chroma: 1 to 4, dry or moist
Texture: Gypsiferous loamy very fine sand, gypsiferous coarse sandy loam, gypsiferous fine sandy loam, gypsiferous very fine sandy loam, gypsiferous loam, or gypsiferous silt loam
Clay content: 5 to 26 percent
Calcium carbonate equivalent: 3 to 15 percent
Gypsum content: 40 to 80 percent
Effervescence: Slightly or strongly
Reaction: Slightly alkaline or moderately alkaline

Formation of the Soil

In this section, the factors of soil formation that include parent material, climate, plant and animal life, relief, and time are related to the formation of the soils in Culberson County. Also, processes of horizon differentiation and the surface geology of the County are described.

Factors of Soil Formation

Soil is formed by the action of soil-forming processes on material deposited or accumulated by geological forces. The characteristics of a soil depend on the physical and mineralogical composition of the parent material, the climate under which the soil material has accumulated and has existed since accumulation, the plant and animal life on and in the soil, the relief, and the length of time the forces of soil development have acted on the soil material.

Climate and living organisms are active factors of soil formation. They act on the parent material that has accumulated through the weathering of rocks and slowly change it into a natural body that has genetically related horizons. The effects of climate and living organisms are conditioned by relief. The parent material affects the kind of soil profile that forms and, in extreme cases, determines it almost entirely. Finally, time is needed for changing the parent material into soil. Generally, a long time is needed for the development of distinct horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effect of any one factor unless conditions are specified for the other factors.

Parent Material

Parent material is the unconsolidated organic and inorganic material in which a soil forms. The parent material determines the physical and chemical properties of the soil. The soils in Culberson County formed in several types of parent material such as residuum, colluvium, alluvium, and eolian material. Residuum is formed in place by weathering of bedrock, colluvium is material that has been moved down steep slopes by gravity, alluvium is material that has been moved by running water, and eolian material is sediment that has been transported by wind.

Climate

Climate is an important factor in soil formation. It fluctuates monthly and yearly because of the change in seasons, and it has also changed over the longer period of geologic time. Culberson County has a warm and dry climate. The low rainfall, high evaporation rate, temperature, and wind are some of the climatic factors which influence soil formation. Soil temperature affects biological activity, chemical reactions, and decomposition of organic matter in the soil. Soil moisture affects biological activity, the leaching of chemical compounds, and the movement of soil colloids in the soil. An increase in soil moisture will result in more soil development.

Water moving through the soil can carry clay particles downward in suspension from the surface layer resulting in a layer that has an accumulation of clay. Water also leaches minerals from the upper layers and deposits them in the lower layers. As a result, soils

have a layer in which calcium carbonate has accumulated. Also, the accumulation of organic matter is affected by temperature and moisture. Low rainfall and high temperatures limit the vegetative growth and accumulation of organic matter in the soils. However, in those areas where more soil moisture is present, such as flood plains, the vegetative production and organic matter contents are higher than the surrounding upland soils. Near surface soil temperatures are lower where there is more vegetation, and the rate of decomposition of organic matter is generally slower.

Plant and Animal Life

Plants, animals, earthworms, insects, and micro-organisms are important factors in the formation of soils. The physical and chemical weathering of bedrock and parent material, the rate of organic matter decomposition, gains or losses in plant nutrients, and changes in soil structure and porosity are among the effects of living organisms.

Vegetation, predominantly grasses and brush, has played a major role in soil formation in Culberson County. Plant roots grow into 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. Decayed roots contribute organic matter to the soils and leave channels and pores that provide passageways for the intake of air and water. Deep rooting brush plants bring nutrients from the subsoil to the surface.

Earthworms, insects, and burrowing animals mix soil materials and create channels for the downward movement of air, water, and plant roots into the soil. Actinomycetes, bacteria, and fungi break down primary forms of organic matter, create humus, and release plant nutrients which improve soil tilth and fertility.

Humans have greatly affected the soils in Culberson County. In the past, some rangeland has been overstocked with livestock and native wildlife. This resulted in overgrazing which caused the better grasses, brush, and forbs to decrease, and be replaced with less desirable grasses, brush, and forbs. Overgrazing by livestock and other animals increases the amount of bare ground and soil compaction, thereby increasing runoff and soil erosion.

Farming has resulted in excessive water and wind erosion in some areas. Crop residue management, terraces, grassed waterways, reduced tillage, and vegetated windstrips help control erosion on cropland. Soil compaction because of farm equipment has slowed the movement of air, moisture, and roots in the soil on much of the cropland in the survey area.

Relief

Relief or topography caused by both slope gradient and aspect affect soil formation through its influence on drainage, runoff and erosion, and plant cover. The degree of development of a soil profile depends on the amount of water that enters the soil, provided other factors of soil formation are equal.

The relief in Culberson County ranges from nearly level to very steep. Soil profile development depends on the amount of moisture and the depth to which moisture penetrates. Sloping soils take in less water and normally have a less developed profile than nearly level soils. Many of the more sloping soils erode almost as fast as they form, and do not have a well developed profile. Nearly all rainfall tends to infiltrate into the soil on nearly level soils. These soils have well developed profiles.

Time

The characteristics of a soil are determined mainly by the length of time that the soil forming factors have been active. Thousands of years may be required for the formation of

well-defined, genetic horizons. Genetically, the soils in Culberson County range from very young to old. Differences in the ages of the soils can be noted in their profiles.

Young soils which developed on recent flood plains consist of altered alluvial sediments.

Old soils are generally nearly level to gently undulating, and are on stable, upland positions on the landscape. Old soils in which calcium carbonate was leached from the upper part of the profile, and accumulated in the lower part of the soil have a layer of cemented caliche, or petrocalcic. Another indication of an old soil is an accumulation of clay. Over time, clay particles are transported by water from the upper part of the soil to the lower part. This accumulation of clay is identified as an argillic horizon.

In general, the longer duration of time that a soil has been forming, the stronger degree of expression its diagnostic horizons will have.

Processes of Horizon Differentiation

This section describes the processes of soil formation, and relates the processes to the soils of Culberson 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 Culberson 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 Culberson County, the main processes are leaching of calcium carbonate and bases, accumulation of organic matter, and formation, eluviation, and illuviation of silicate clay minerals. 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 Culberson 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 Yarbam 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 Antbed, McAllister, Leyva, 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. Tenneco, Michigan, and Reyab 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." Bissett, Chilicotal, Chispa, and Corazones 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 Culberson County, Bkkm horizons of the Culberspeth and Ojinaga soils that occur on high, stable geomorphic surfaces have resulted from exposure to soil-forming processes over extended periods of geologic time.

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. Chillon soils have a BC horizon.

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 and rivers the C horizon is directly below the A horizon. Aguena and Chipotle soils have C horizons.

The R horizon is unweathered bedrock under the soil material. Examples of bedrock are limestone, sandstone, basalt, rhyolite, and gyprock. Minerals in the bedrock influence soil properties and horizons.

Surface Geology

The geologic units in Culberson County range in geologic age from Precambrian to Holocene, from about 2,500 million years to less than 11,000 years in age. According to the geologic units in Culberson County, Texas there are 64 geologic units identified in Culberson County.

The rocks in Culberson County originated by igneous, sedimentary, and metamorphic processes. The lithology is very diverse in Culberson County. The geologic formations are arranged by geologic time and general lithology. The rock groups include Precambrian (2,500 to 542 million years old), Paleozoic (542 to 251 million years old), Mesozoic (251 to 65 million years old), and Cenezoic (65 million years old to the present).

Precambrian

Precambrian age formations include Allamore, Hazel, and Van Horn Sandstone with limestone, sandstone, and conglomerate rock types. The Carrizo Mountain Group formation which includes both metaigneous with granodiorite and amphibolite rock types, and metasedimentary with phylitte and mica schist rock types are also Precambrian age formations. These Precambrian formations ranges from 800 to several thousand feet thick. Residuum weathered from the bedrock in these formations is the parent material for the Allamore and Beach soils.

Paleozoic

Early Paleozoic age formations include El Paso, Bliss Sandstone, Montoya Dolomite, and Fusselman Dolomite with limestone and dolostone rock types. These formations range from 100 to 1,100 feet thick. Late Paleozoic age (Permian age) formations include Bone Spring, Capitan, Hueco Limestone, Munn, Seven Rivers, Tansill, Victorio Peak, Bell Canyon, Brushy Canyon, Carlsbad Group, Goat Seep, Cherry Canyon, Cutoff, Markley, Rustler, Dewey Lake Red beds, and Yates. Some of the rock types found in these formations include limestone, dolostone, sandstone, siltstone, mudstone, and shale. These formations range from 100 to 1,700 feet thick. Residuum weathered from the interbedded limestone, dolostone, sandstone, siltstone, mudstone, and shale in these formations is the parent material for the Yarbam and Bissett soils. Salado and Castille are also late Paleozoic (Permian) age formations with evaporite rock types. Residuum weathered from the evaporite is the parent material for the Elcor, Hollebeke, and Neimahr soils.

Mesozoic

Cretaceous age formations include Eagle Mountain Sandstone, Benevides, Bluff Mesa, Maxon Sandstone, San Martine Member of Boracho Limestone, Boquillas, Loma Plata, Yearwood, Aguja, Buda Limestone, Finlay Limestone, Boracho Limestone, Cox Sandstone, Gulfian Rocks, Ojinaga, Yucca, and Glen Rose Limestone. The rock types found in these formations include sandstone, limestone, shale, siltstone, conglomerate, mudstone, and clay or mud. These formations range from 15 to 5,500 feet thick. Residuum weathered from the limestone, dolostone, sandstone, siltstone, mudstone, and shale in these formations is the parent material for the Bissett soil.

Cenezoic

Tertiary age (65 to 2.5 million years old) formations include Tertiary intrusive rocks, older volcanic rocks of Davis and Barilla Mountains, Eocene intrusive rocks, Van Horn Mountains caldera, Wiley Mountain caldera, Vieja Group, Eagle Mountains caldera, Oligicene intrusive rocks, and Jones Basalt. The rock types found in these formations include granite, rhyolite, trachyte, basalt, agglomerate, trachyandesite, coarse grained mixed clastic, and sandstone. Residuum weathered from these volcanic formations is the parent material for Lampshire, Bofecillos, Horsetrap, Pantak, and Leyva soils. Colluvium from these formations is the parent material for the Lampshire soil. Other formations of the Tertiary age include Tarantula Gravel which is about 400 feet thick with gravel and tuff rock types; and Quaternary-Tertiary bolson deposits with clay or mud and silt materials. The Quaternary-Tertiary bolson deposits are the parent material for the Changas soils.

Quaternary age (2.5 million years old to the present) formations include the following: Pleistocene age older alluvial deposits and Leona with gravel and sand materials; and Toy Limestone with limestone rock types.

Pleistocene to Holocene age formations include the following: Bolson deposits with clay or mud and silt materials, Alluvial fan deposits with loose rock material, and landslide deposits with bouldery rock material. Older alluvial deposits and alluvial fan deposits are the parent material for Chilicotal, Corazones, Culberspeth, and Ojinaga soils. Holocene age formations include alkali flat deposits with stratified clay, silt, and sand and evaporite rock types, and alluvium and sand sheet deposits with sand and silt materials. Gypsic

Aquisalids formed in alkali flat deposits. Sandy alluvium is the parent material for Aguena, Kinco, and Perilla soils. Loamy alluvium is the parent material for Chispa, Dellahunt, Double, Kahn, Joberanch, McAllister, Monahans, Reyab, Stovall, and Tenneco soils. Clayey alluvium is the parent material for Antbed, Dalby, Michigan, and Verhalen soils. Alluvium from the evaporite (gypsum) rock is the parent material for Corvus, Hollomex, Lark, Loki, Peligro, Pokorny and Yesum soils. The Walkerwells soils formed in stratified nongravelly alluvium, and the Chipotle, Chillon, and Pantera soils formed in stratified gravelly alluvium.

Soil Relationships to Geology and Landforms

One of the dominant landforms in Culberson County includes the mountains, fans, and basins. Figure 35 shows the soil relationship to geology and landform in these areas. The shallow Bissett, Allamore, and Beach soils are found on hills and mountains. Bissett soils formed in gravelly residuum from limestone bedrock, and Allamore and Beach soils formed in gravelly residuum from sandstone bedrock. The Culberspeth, Chilicotal, and Chispa soils formed in fan alluvium and are located on fan remnants that are lower than the bedrock soils. The Culberspeth soils are shallow to a petrocalcic, the Chilicotal soils have a calcic horizon that averages over 35 percent gravels, and the Chispa soils have a calcic horizon that averages less than 35 percent gravels. The Double and McAllister soils are deep loamy soils formed in alluvium on alluvial fans. The clayey Antbed and Michigan soils formed in alluvium and are lower in the landscape on alluvial flats. The deep silty Reyab soils formed in alluvium and are located on flood plains. The Verhalen and Dalby soils formed in alluvium and are on the basin floor which is the lowest part of the landscape.

Another dominant landform in Culberson County is the Castille gypsum formation in the northeastern part of the County. Figure 36 shows the soil relationship to geology and landform in this area. The shallow Elcor soils are on hills and formed in residuum from

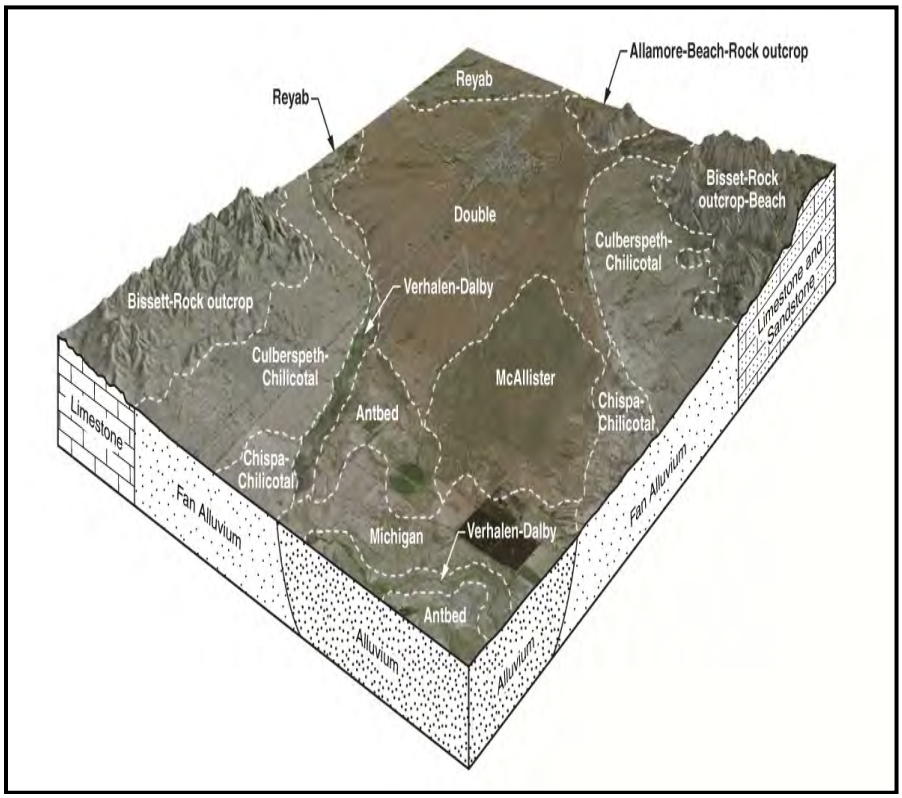

Figure 35.—Parent materials and soil mapping units on mountains, fans, and basins.

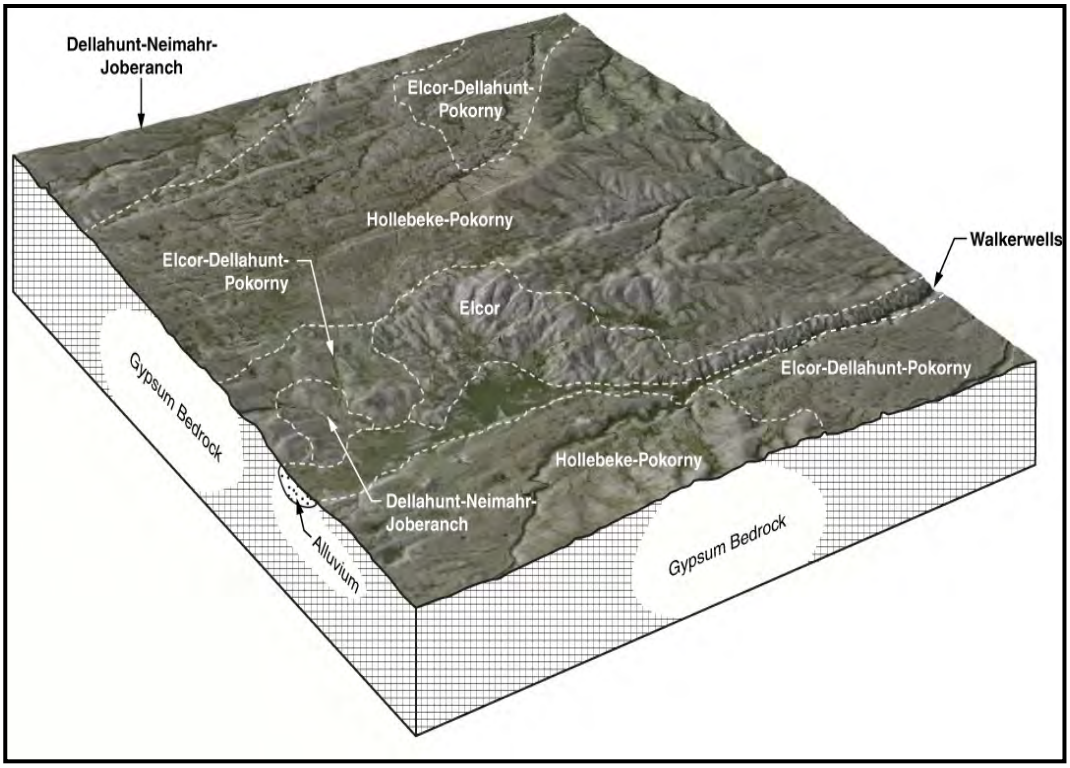

Figure 36.—Parent materials and soil mapping units on the Castille Formation.

gypsum bedrock. The shallow Hollebeke soils are slightly lower on the landscape than the Elcor soils. They are on low hills and formed in residuum from gypsum bedrock. The Hollebeke soils have a petrogypsic horizon above the gypsum bedrock. The Pokorny, Dellahunt, Neimahr, and Joberanch soils are all located on alluvial flats. The Pokorny soils formed in alluvium from gypsum and are shallow to a petrogypsic horizon. The Dellahunt, Neimahr, and Joberanch soils formed in alluvium from sandstone and gypsum. The Dellahunt soils are very deep, the Neimahr soils have a silicate surface and are shallow to gypsum bedrock, and the Joberanch soils have a silicate surface and are shallow to a petrogypsic horizon. The Walkerwells soils are on flood plains and in drainageways and formed in alluvium from sandstone and gypsum.

The soil relationship to geology and landform in the Salt Basin area is depicted in Figure 37. The shallow Bissett, Allamore, and Beach soils are found on hills and mountains. Bissett soils formed in gravelly residuum form limestone bedrock, and Allamore and Beach soils formed in gravelly residuum from sandstone bedrock. The Bissett moist soils are at a higher elevation which has slightly cooler temperatures and increased moisture which affects the type of vegetation that occurs in that area. The Culberspeth and Chilicotal soils formed in fan alluvium and are located on fan remnants that are lower than the bedrock soils. The Culberspeth soils are shallow to a petrocalcic, and the Chilicotal soils have a calcic horizon that averages over 35 percent gravels. The Double soils are deep loamy soils formed in alluvium on alluvial fans. The Monahans soils are also on alluvial fans and are deep sandy loam soils formed in alluvium with a gypsic horizon. The Corvus and Peligro soils formed in gypsiferous eolian deposits and are on relict gypsum dunes. Corvus is shallow to a petrogypsic horizon, and Peligro has a gypsic horizon. Yesum and Loki soils formed in gypsiferous alluvium and are on alluvial flats. Yesum soils are shallow to gypsiferous material and Loki soils have a silicate cap over gypsiferous material. The Gypsic Aquisalids or the salt flats formed in gypsiferous lacustrine materials and are on the basin floor.

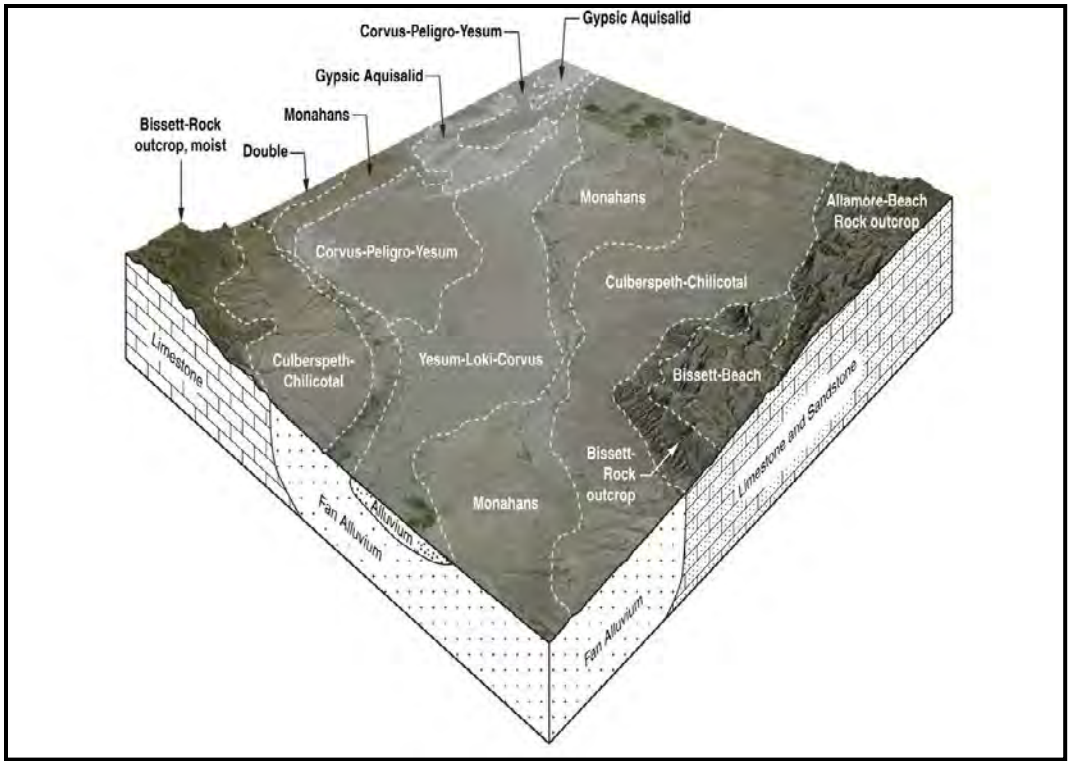

Figure 37.—Parent materials and soil mapping units in the Salt Basin area.

The soil relationship to geology and landform in the southwestern part of the County near the Hudspeth County line is depicted in Figure 38. The shallow Bissett, Allamore, and Beach soils are found on hills and mountains. Bissett soils formed in gravelly residuum from limestone bedrock, and Allamore and Beach soils formed in gravelly residuum from sandstone bedrock. The Bissett moist soils are at a higher elevation which has slightly cooler temperatures and increased moisture which affects the type of vegetation that occurs in that area. The Culberspeth and Chilicotal soils formed in fan alluvium and are located on fan remnants that are lower than the bedrock soils. The Culberspeth soils are shallow to a petrocalcic, and the Chilicotal soils have a calcic horizon that averages over 35 percent gravels. The Double soils are deep loamy soils formed in alluvium on alluvial fans. The deep silty Reyab soils formed in alluvium and are located on flood plains.

Figure 39 shows the soil relationship to geology and landform in the Delaware Mountains area. The soils in this area are called moist because they are at a higher elevation which has slightly cooler temperatures and increased moisture which affects the type of vegetation that occurs in that area. The shallow Allamore and Beach soils are found on hills and mountains. They formed in gravelly residuum form limestone and sandstone bedrock. The Tenneco soils formed in alluvium and are on fan piedmonts below the bedrock soils.

The soil relationship to geology and landform in the western part of the County above the Sierra Diablo Rim near the Hudspeth County line is depicted in Figure 40. The soils in this area are called moist because they are at a higher elevation which has slightly cooler temperatures and increased moisture which affects the type of vegetation that occurs in that area. The shallow Bissett soils are found on hills and mountains. Bissett soils formed in gravelly residuum from limestone bedrock. The Culberspeth and Kahn soils formed in fan alluvium and are located on fan remnants that are lower than the bedrock soils. The Culberspeth soils are shallow to a petrocalcic and the Kahn soils have a calcic horizon that averages less than 35 percent gravels. The deep silty Reyab soils formed in alluvium and are located on flood plains.

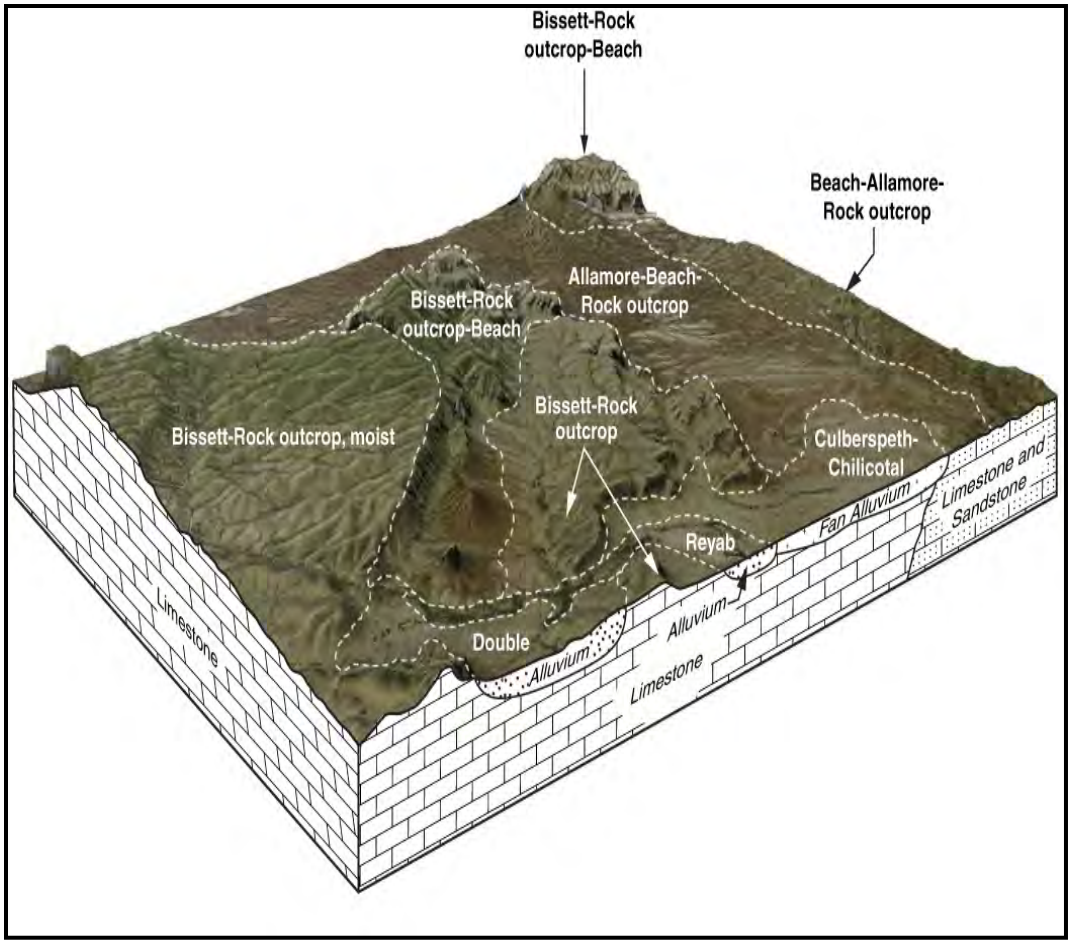

Figure 38.—Parent materials and soil mapping units on limestone and sandstone.

The soil relationship to geology and landform in the Apache Mountains area is depicted in Figure 41. The shallow Bissett and Beach soils are found on hills and mountains. Bissett soils formed in gravelly residuum from limestone bedrock, and Beach soils formed in gravelly residuum from sandstone bedrock. The Bissett moist soils are at a higher elevation which has slightly cooler temperatures and increased moisture which affects the type of vegetation that occurs in that area. The Culberspeth and Chilicotal soils formed in fan alluvium and are located on fan remnants that are lower than the bedrock soils. The Culberspeth soils are shallow to a petrocalcic, and the Chilicotal soils have a calcic horizon that averages over 35 percent gravels. The Double soils are deep loamy soils formed in alluvium on alluvial fans. The deep silty Reyab soils formed in alluvium are located on flood plains.

Figure 42 shows the soil relationship to geology and landform in the southwest corner of Culberson County near the Hudspeth County line. The shallow Bissett, Beach, Lampshire, and Pantak soils are found on hills and mountains. Bissett soils formed in gravelly residuum form limestone bedrock, Beach soils formed in gravelly residuum from sandstone bedrock, Lampshire, and Pantak soils formed in residuum from igneous bedrock. The Culberspeth, Chilicotal, and Chispa soils formed in fan alluvium and are located on fan remnants that are lower than the bedrock soils. The Culberspeth soils are shallow to a petrocalcic, the Chilicotal soils have a calcic horizon that averages over 35 percent gravels, and the Chispa soils have a calcic horizon that averages less than 35 percent gravels. The deep silty Reyab soils formed in alluvium are located on flood plains.

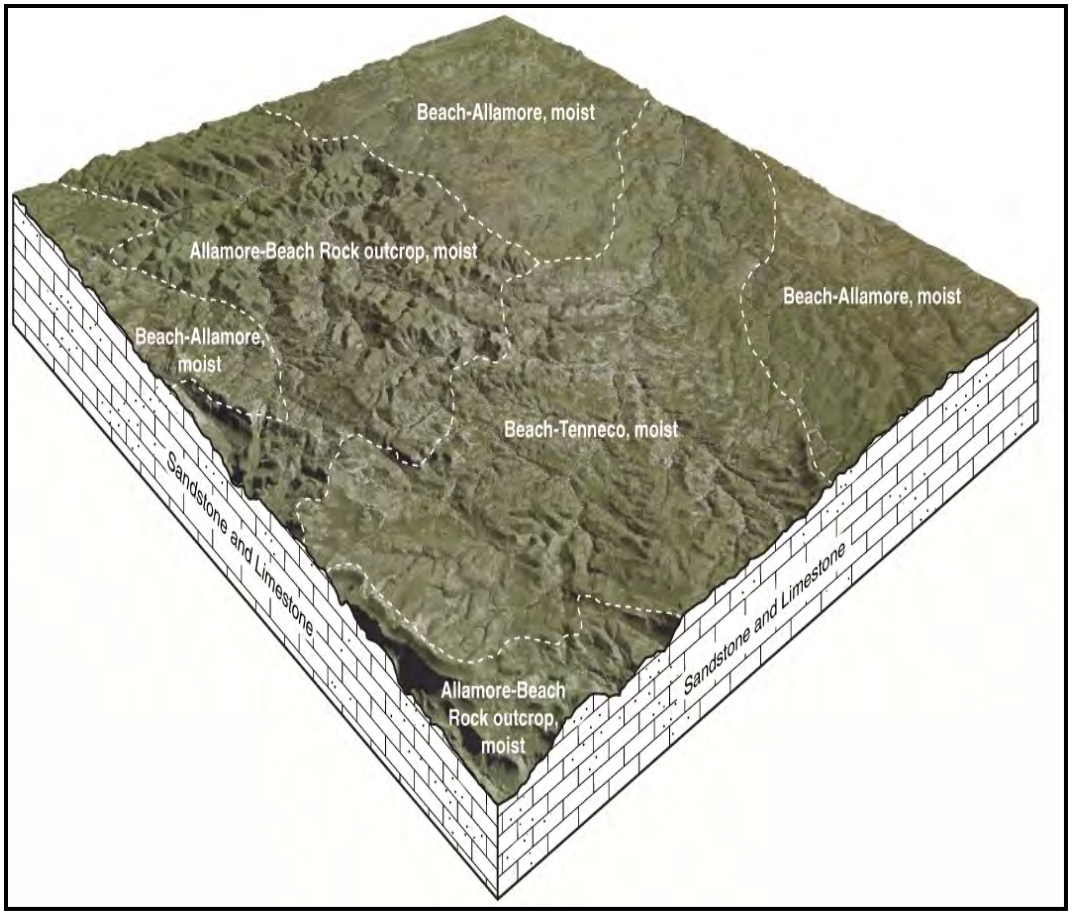

Figure 39.—Parent materials and soil mapping units of the Delaware Mountain area.

The soils to the southwest are at lower elevations and have slightly warmer temperatures and decreased moisture which affects the type of vegetation that occurs in that area. The Ojinaga and Corazones soils formed in fan alluvium and are located on fan remnants. The Ojinaga soils are shallow to a petrocalcic, and the Corazones soils have a calcic horizon that averages over 35 percent gravels. The Changas soils formed in gypsiferous clayey bolson materials and are on fan remnants. The Chillon soils formed in fan alluvium and are on terraces that are slightly higher than the arroyos. The Pantera soils formed in alluvium and are in arroyos.

Figure 43 shows the soil relationship to geology and landform in southern Culberson County. The Lampshire, Pantak, Horsetrap, and Bofecillos soils are shallow. The Lampshire and Pantak soils formed in residuum from igneous bedrock and are on hills. The Horsetrap and Bofecillos soils are on hills and low hills and formed in residuum from basalt bedrock. The Culberspeth, Chilicotal, and Chispa soils formed in fan alluvium and are located on fan remnants that are lower than the bedrock soils. The Culberspeth soils are shallow to a petrocalcic, the Chilicotal soils have a calcic horizon that averages over 35 percent gravels, and the Chispa soils have a calcic horizon that averages less than 35 percent gravels. The Double soils are deep loamy soils formed in fan alluvium on alluvial fans. The Chipotle soils formed in alluvium and are in arroyos.

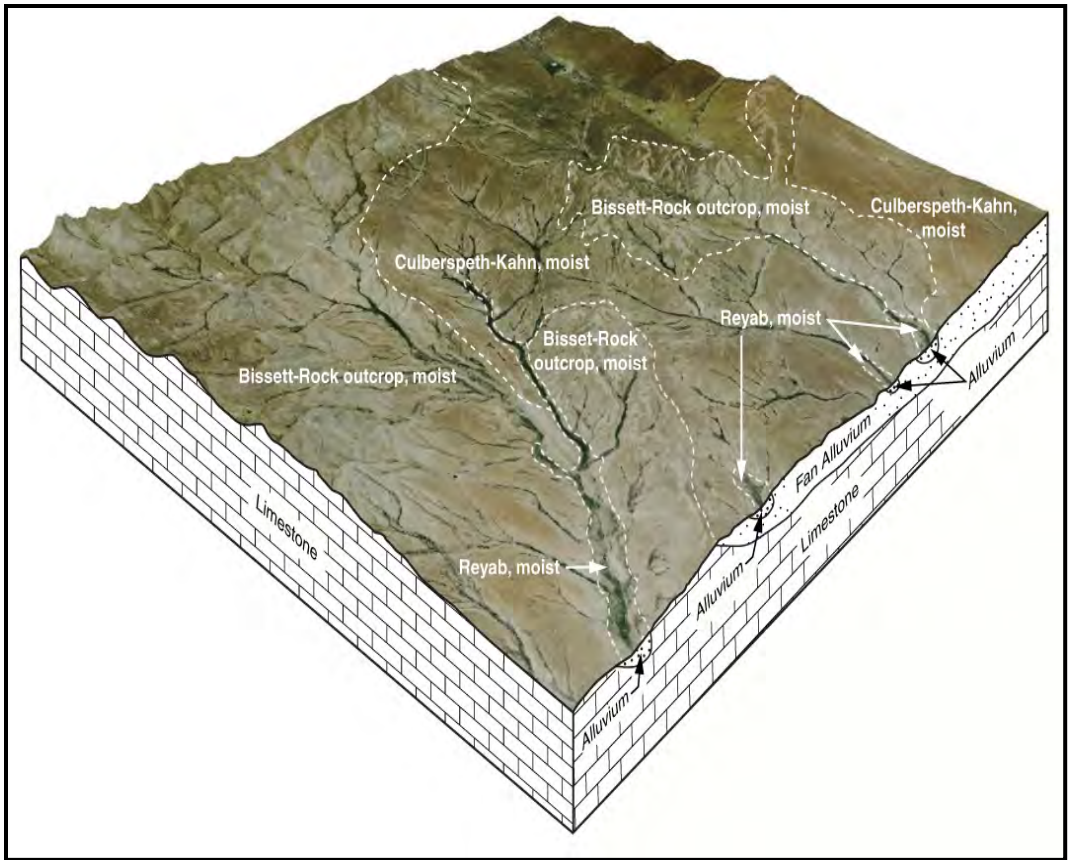

Figure 40.—Parent materials and soil mapping units above the Sierra Diablo rim.

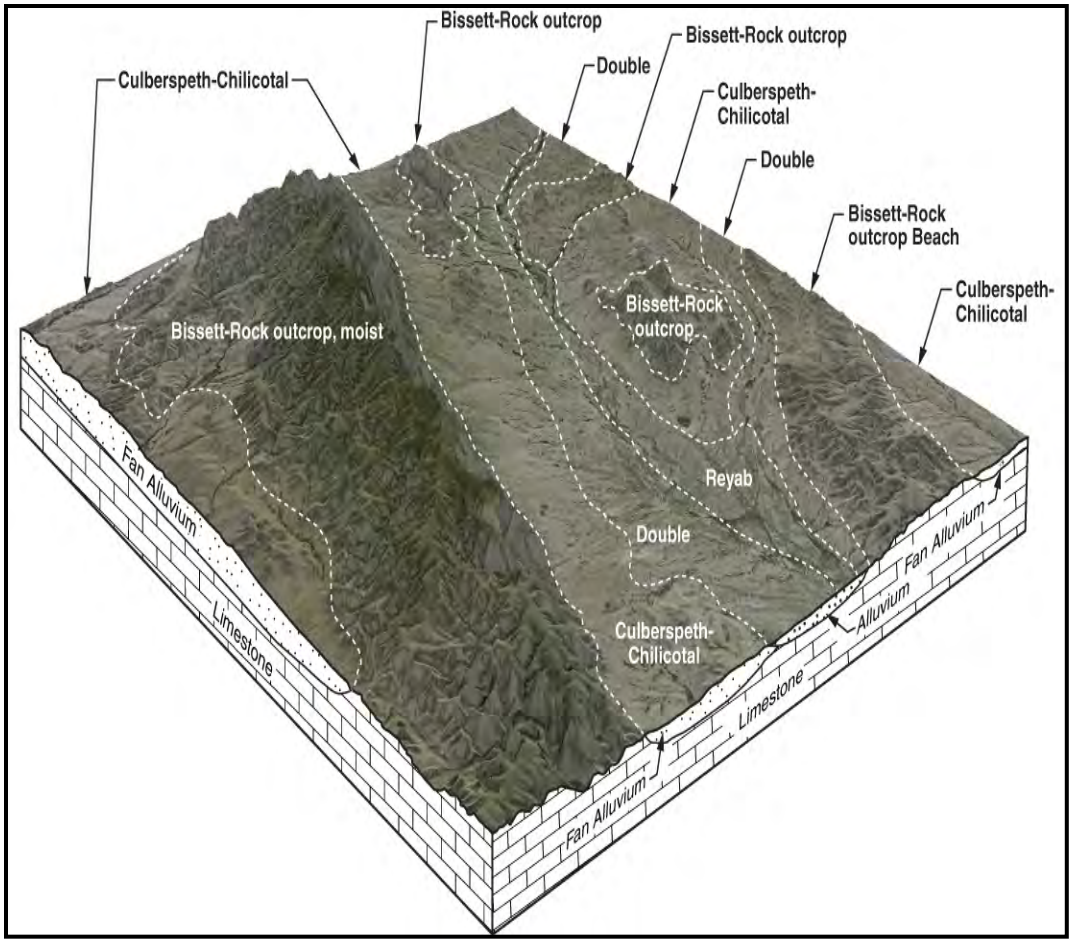

Figure 41.—Parent materials and soil mapping units of the Apache Mountain area.

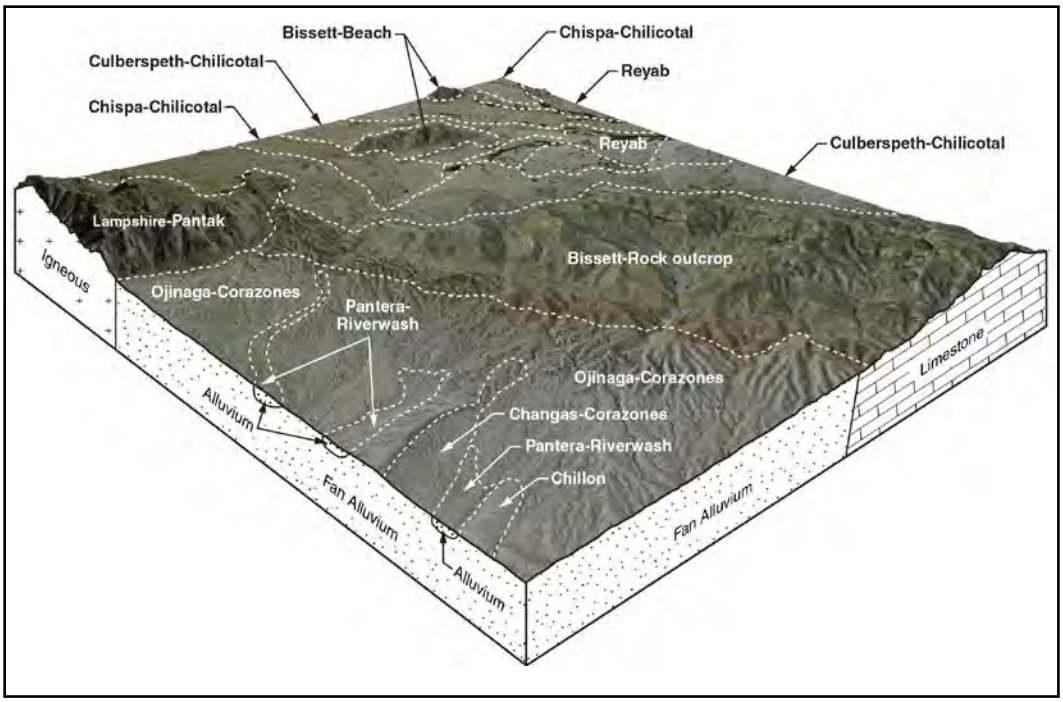

Figure 42.—Parent materials and soil mapping units in southwestern Culberson County.

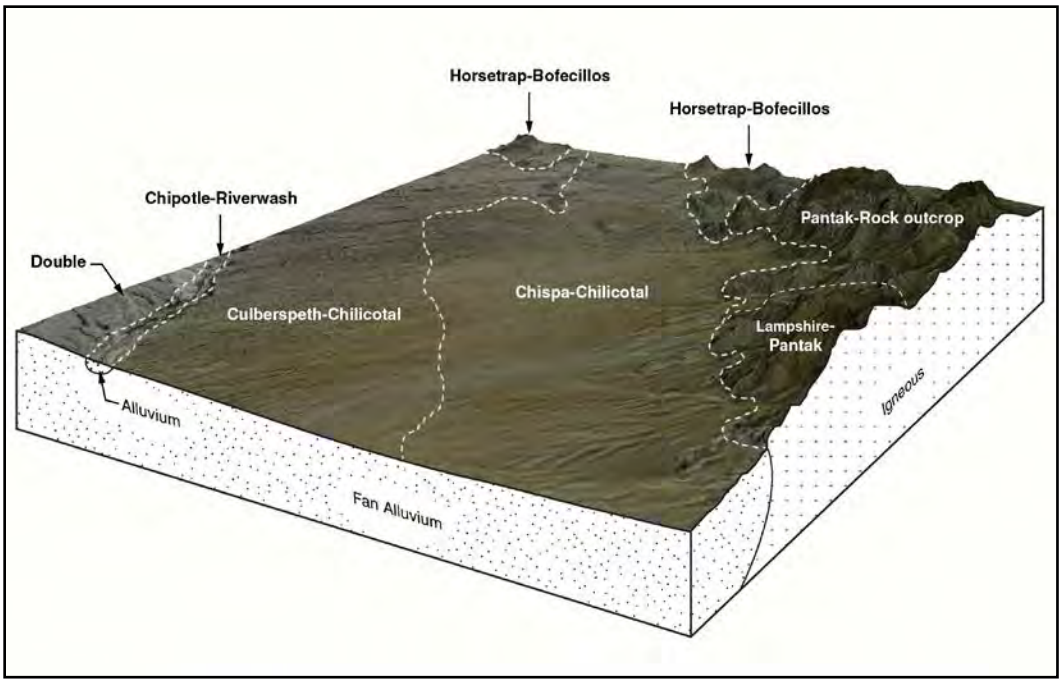

Figure 43.—Parent materials and soil mapping units in southern Culberson County.

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-0.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS 79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. February 24, 1995. Hydric soils of the United States.

Handbook of Texas Online (http://www.tshaonline.org/handbook/online/articles/hcc28), "CULBERSON COUNTY," accessed January 23, 2011.

Hurt, G.W., P.M. Whited, and R.F. Pringle, editors. Version 5.0, 2002. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and W.D. Broderson, editors. 2002. Field book for describing and sampling soils. Version 2.0. U.S. Department of Agriculture, Natural Resources Conservation Service.

Soil Survey Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://soils.usda.gov/technical/

Soil Survey Staff. 2003. Keys to soil taxonomy. 9th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. 1996. Soil survey laboratory methods manual. Soil Survey Investigations Report 42, Version 3.0. http://soils.usda.gov/technical/

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

Wilding, L.P., N.E. Smeck, and G.F. Hall. 1983. Pedogenesis and soil taxonomy, II: The soil orders.

http://tin.er.usgs.gov/geology/state/fips-unit.php?code=f48109; accessed January 23, 2011

http://en.wikipedia.org/wiki/Proterozoic; accessed January 23, 2011

http://en.wikipedia.org/wiki/Paleozoic; accessed January 23, 2011

http://en.wikipedia.org/wiki/Mesozoic; accessed January 23, 2011

http://en.wikipedia.org/wiki/Cenezoic; accessed January 23, 2011

Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "National Soil Survey Handbook" which is available in local offices of the Natural Resources Conservation Service or on the Internet at http://soils.usda.gov/technical/handbook/).

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 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables)**.** Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables)**.** Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

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 to 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 for the period 1971-2000 at Van Horn, 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
January	57.6	27.8	42.7	76	10	14	0.39	0.07	0.63	2
February	63.1	31.4	47.3	81	13	46	0.33	0.00	0.58	1
March	69.9	37.5	53.7	87	19	153	0.16	0.00	0.28	1
April	77.4	44.1	60.8	93	28	332	0.24	0.00	0.42	1
May	85.4	53.8	69.6	101	40	607	0.71	0.18	1.15	2
June	92.5	62.4	77.5	106	52	823	1.25	0.41	1.96	3
July	91.7	64.8	78.3	105	59	876	2.11	0.83	3.19	4
August	89.6	63.4	76.5	102	55	820	2.30	1.21	3.30	6
September	84.5	57.1	70.8	98	42	624	2.23	0.61	3.55	4
October	76.9	46.7	61.8	94	30	370	1.27	0.19	2.10	2
November	66.1	35.4	50.8	83	19	126	0.46	0.00	0.80	1
December	58.0	28.4	43.2	77	11	23	0.53	0.05	0.89	1
Yearly:										
Average	76.1	46.1	61.1	---	---	---	---	---	---	---
Extreme	112	-7	---	107	8	---	---	---	---	---
Total	---	---	---	---	---	4,814	11.98	8.37	15.31	22

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 50.0 degrees F)

Table 2.--Freeze Dates in Spring and Fall

(Recorded for the period 1971-2000 at Van Horn, 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 22	April 5	April 17
2 year in 10 later than--	March 16	March 29	April 11
5 year in 10 later than--	March 4	March 17	April 1
First freezing temperature in fall:			
1 yr in 10 earlier than--	November 17	October 30	October 27
2 yr in 10 earlier than--	November 23	November 5	October 31
5 yr in 10 earlier than--	December 4	November 15	November 10

Table 3.--Growing Season

(Recorded for the period 1971-2000 at Van Horn, 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	232	196	187
8 years in 10	243	207	196
5 years in 10	263	229	213
2 years in 10	283	250	230
1 year in 10	294	262	239

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AAD----	Aguena loamy fine sand, 1 to 10 percent slopes	14,559	0.6
ABE----	Allamore-Beach-Rock outcrop complex, 5 to 30 percent slopes	9,565	0.4
ABG----	Allamore-Beach-Rock outcrop complex, moist, 20 to 70 percent slopes	110,845	4.7
ANB----	Antbed loam, 0 to 3 percent slopes	11,742	0.5
BBC----	Beach very cobbly sandy loam, 1 to 8 percent slopes	30,548	1.3
BBD----	Beach very gravelly coarse sandy loam, 5 to 16 percent slopes	68,532	2.9
BCE----	Beach-Allamore complex, moist, 5 to 30 percent slopes	33,494	1.4
BCG----	Beach-Allamore-Rock outcrop complex, 20 to 70 percent slopes	3,509	0.1
BED----	Beach-Tenneco complex, moist, 3 to 16 percent slopes	47,171	2.0
BHE----	Bissett-Beach complex, 10 to 30 percent slopes	66,821	2.8
BID----	Bissett-Rock outcrop complex, 3 to 16 percent slopes	98,900	4.2
BIE----	Bissett-Rock outcrop complex, 10 to 30 percent slopes	91,304	3.8
BIG----	Bissett-Rock outcrop complex, 20 to 60 percent slopes	101,064	4.2
BRE----	Bissett-Rock outcrop complex, moist, 3 to 20 percent slopes	9,139	0.4
BRG----	Bissett-Rock outcrop complex, moist, 20 to 65 percent slopes	57,054	2.4
BSG----	Bissett-Rock outcrop-Beach complex, 20 to 70 percent slopes	58,841	2.5
BVC----	Bofecillos-Leyva complex, 1 to 8 percent slopes	4,931	0.2
BVE----	Bofecillos-Leyva-Horsetrap complex, 10 to 30 percent slopes	8,916	0.4
CCE----	Changas-Corazones complex, 1 to 30 percent slopes	2,222	*
CHC----	Chilicotal very gravelly loam, 1 to 8 percent slopes	7,465	0.3
CIB----	Chillon extremely gravelly sandy loam, 1 to 3 percent slopes	106	*
CLA----	Chipotle-Riverwash complex, 0 to 2 percent slopes, frequently flooded	3,887	0.2
COC----	Chispa-Chilicotal complex, 1 to 8 percent slopes	42,605	1.8
CPC----	Chispa-Tenneco complex, 0 to 8 percent slopes	42,404	1.8
CTC----	Corvus-Peligro-Yesum complex, 1 to 8 percent slopes	31,218	1.3
CVC----	Culberspeth-Chilicotal complex, 1 to 8 percent slopes	251,290	10.5
CWC----	Culberspeth-Kahn complex, moist, 1 to 8 percent slopes	4,130	0.2
DEB----	Dellahunt silt loam, 0 to 5 percent slopes, occasionally flooded	36,844	1.5
DNB----	Dellahunt-Neimahr-Joberanch complex, 1 to 3 percent slopes	92,686	3.9
DOC----	Double loam, 1 to 8 percent slopes	94,414	4.0
ELC----	Elcor gypsiferous loam, 1 to 8 percent slopes	21,739	0.9
ELE----	Elcor gypsiferous loam, 5 to 30 percent slopes	43,051	1.8
EPA----	Elcor-Dellahunt-Pokorny complex, 0 to 2 percent slopes	196,640	8.3
EPE----	Elcor-Pokorny-Hollomex-Walkerwells complex, 0 to 30 percent slopes	9,947	0.4
GAA----	Gypsic Aquisalids, 0 to 2 percent slopes, occasionally flooded	712	*
HPC----	Hollebeke-Pokorny complex, 1 to 8 percent slopes	189,444	8.0
HRC----	Horsetrap-Bofecillos complex, 1 to 8 percent slopes	8,558	0.4
KPB----	Kinco-Aguena-Perilla complex, 1 to 5 percent slopes	77,495	3.3
LPG----	Lampshire-Pantak complex, 10 to 60 percent slopes	5,843	0.2
LRE----	Lark gypsiferous sand, 5 to 20 percent slopes	369	*
MAB----	McAllister fine sandy loam, 0 to 3 percent slopes	47,951	2.0
MCB----	Michigan clay, 0 to 3 percent slopes	16,971	0.7
MHA----	Monahans fine sandy loam, 0 to 2 percent slopes	60,943	2.6
OCB----	Ojinaga-Corazones complex, 1 to 5 percent slopes	148	*
OCF----	Ojinaga-Corazones complex, 1 to 40 percent slopes	7,962	0.3
PAG----	Pantak-Rock outcrop complex, 20 to 70 percent slopes	15,475	0.6
PRA----	Pantera-Riverwash complex, 0 to 2 percent slopes, frequently flooded	385	*
RLA----	Reyab loam, moist, 0 to 1 percent slopes, occasionally flooded	26,146	1.1
RSA----	Reyab silt loam, 0 to 2 percent slopes, occasionally flooded	95,465	4.0
RXG----	Rock outcrop-Lampshire complex, 5 to 60 percent slopes	931	*
STB----	Stovall clay loam, 0 to 3 percent slopes	23,859	1.0
TEC----	Tenneco silt loam, moist, 3 to 8 percent slopes	23,959	1.0
VDA----	Verhalen-Dalby association, 0 to 1 percent slopes, rarely flooded	34,405	1.4
WAB----	Walkerwells silty clay loam, 0 to 3 percent slopes, occasionally flooded	24,493	1.0
YAG----	Yarbam-Rock outcrop complex, 35 to 65 percent slopes	2,775	0.1
YLA----	Yesum-Loki-Corvus complex, 0 to 1 percent slopes	10,745	0.5
	Total	2,382,617	100.0

* Less than 0.1 percent.

Table 5.--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		Cotton lint		Pasture	
	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	AUM	AUM
AAD:			---	---	---	---	---	---
Aguena	6c	---						
ABE:			---	---	---	---	---	---
Allamore	7s	---						
Beach	7s	---						
Rock outcrop	8s	---						
ABG:			---	---	---	---	---	---
Allamore, moist	7s	---						
Beach, moist	7s	---						
Rock outcrop	8s	---						
ANB:			---	6.0	---	1,050.00	---	---
Antbed	6e	2e						
BBC:			---	---	---	---	---	---
Beach	7s	---						
BBD:			---	---	---	---	---	---
Beach	7s	---						
BCE:			---	---	---	---	---	---
Beach, moist	7s	---						
Allamore, moist	7s	---						
BCG:			---	---	---	---	---	---
Beach	7s	---						
Allamore	7s	---						
Rock outcrop	8s	---						
BED:			---	---	---	---	---	---
Beach, moist	7s	---						
Tenneco, moist	6s	---						
BHE:			---	---	---	---	---	---
Bissett	7s	---						
Beach	7s	---						
BID:			---	---	---	---	---	---
Bissett	7s	---						
Rock outcrop	8s	---						
BIE:			---	---	---	---	---	---
Bissett	7s	---						
Rock outcrop	8s	---						
BIG:			---	---	---	---	---	---
Bissett	7s	---						
Rock outcrop	8s	---						
BRE:			---	---	---	---	---	---
Bissett, moist	7s	---						
Rock outcrop	8s	---						

Table 5.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Cotton lint		Pasture	
	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	AUM	AUM
BRG:			---	---	---	---	---	---
Bissett, moist	7s	---						
Rock outcrop	8s	---						
BSG:			---	---	---	---	---	---
Bissett	7s	---						
Rock outcrop	8s	---						
Beach	7s	---						
BVC:			---	---	---	---	---	---
Bofecillos	7s	---						
Leyva	6s	---						
BVE:			---	---	---	---	---	---
Bofecillos	7s	---						
Leyva	7s	---						
Horsetrap	6s	---						
CCE:			---	---	---	---	---	---
Changas	7s	---						
Corazones	6c	---						
CHC:			---	---	---	---	---	---
Chilicotal	7s	---						
CIB:			---	---	---	---	---	---
Chillon	7s	---						
CLA:			---	---	---	---	---	---
Chipotle	7s	---						
Riverwash	8w	---						
COC:			---	---	---	---	---	---
Chispa	6s	---						
Chilicotal	7s	---						
CPC:			---	---	---	---	---	---
Chispa	6s	---						
Tenneco	6c	---						
CTC:			---	---	---	---	---	---
Corvus	7c	---						
Yesum	7c	---						
Peligro	7c	---						
CVC:			---	---	---	---	---	---
Culberspeth	7s	---						
Chilicotal	6s	---						
CWC:			---	---	---	---	---	---
Culberspeth, moist	7s	---						
Kahn, moist	6s	---						
DEB:			---	---	---	---	---	---
Dellahunt	6c	---						

Table 5.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Cotton lint		Pasture	
	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	AUM	AUM
DNB:			---	---	---	---	---	---
Dellahunt	6c	---						
Neimahr	6s	---						
Joberanch	6s	---						
DOC:			---	---	---	---	---	---
Double	6c	---						
ELC:			---	---	---	---	---	---
Elcor	7s	---						
ELE:			---	---	---	---	---	---
Elcor	7s	---						
EPA:			---	---	---	---	---	---
Elcor	7s	---						
Dellahunt	6c	---						
Pokorny	6s	---						
EPE:			---	---	---	---	---	---
Elcor	7s	---						
Pokorny	6s	---						
Walkerwells	6c	---						
Hollomex	6c	---						
GAA:			---	---	---	---	---	---
Gypsic Aquisalids	8s	---						
HPC:			---	---	---	---	---	---
Hollebeke	7s	---						
Pokorny	6s	---						
HRC:			---	---	---	---	---	---
Horsetrap	6s	---						
Bofecillos	7s	---						
KPB:			---	---	---	---	---	---
Kinco	6c	---						
Aguena	6c	---						
Perilla	6c	---						
LPG:			---	---	---	---	---	---
Lampshire	7s	---						
Pantak	7s	---						
LRE:			---	---	---	---	---	---
Lark	7c	---						
MAB:			---	6.00	---	700.00	---	11.00
McAllister	6c	2e						
MCB:			---	6.00	---	1,250.00	---	---
Michigan	6c	2e						
MHA:			---	6.00	---	1,000.00	---	---
Monahans	7e	2e						

Table 5.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Cotton lint		Pasture	
	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	AUM	AUM
OCB:			---	---	---	---	---	---
Ojinaga	7s	---						
Corazones	6c	---						
OCF:			---	---	---	---	---	---
Ojinaga	7s	---						
Corazones	6c	---						
PAG:			---	---	---	---	---	---
Pantak	7s	---						
Rock outcrop	8s	---						
PRA:			---	---	---	---	---	---
Pantera	6c	---						
Riverwash	8w	---						
RLA:			---	---	---	---	---	---
Reyab, moist	6c	---						
RSA:			---	---	---	---	---	---
Reyab	6c	---						
RXG:			---	---	---	---	---	---
Rock outcrop	8s	---						
Lampshire	7s	---						
STB:			---	6.00	---	1,000.00	---	---
Stovall	6c	2e						
TEC:			---	---	---	---	---	---
Tenneco, moist	6s	---						
VDA:			---	8.00	---	1,100.00	---	---
Verhalen	6c	2s						
Dalby	6c	2s						
WAB:			---	---	---	---	---	---
Walkerwells	6c	---						
YAG:			---	---	---	---	---	---
Yarbam	7s	---						
Rock outcrop	8s	---						
YLA:			---	6.00	---	875.00	---	12.00
Yesum	7s	3s						
Loki	7s	3s						
Corvus	7s	3s						

Table 6.--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
AAD:				
Aguena	Sand Hills, Desert Grassland	900	750	600
ABE:				
Allamore	Sandstone Hill and Mountain, Desert Grassland	1,000	750	550
Beach	Sandstone Hill and Mountain, Desert Grassland	1,000	750	500
ABG:				
Allamore, moist	Limestone Hill, Dry Mixed Prairie	1,200	900	700
Beach, moist	Sandstone Hill, Dry Mixed Prairie	1,200	900	700
ANB:				
Antbed	Loamy, Desert Grassland	1,200	900	600
BBC:				
Beach	Sandstone Hill and Mountain, Desert Grassland	1,000	750	500
BBD:				
Beach	Sandstone Hill and Mountain, Desert Grassland	1,000	750	500
BCE:				
Beach, moist	Sandstone Hill	1,300	1,000	750
Allamore, moist	Limestone Hill, Dry Mixed Prairie	1,300	1,000	750
BCG:				
Beach	Sandstone Hill and Mountain, Desert Grassland	1,000	750	500
Allamore	Sandstone Hill and Mountain, Desert Grassland	900	700	500
BED:				
Beach, moist	Sandstone Hill, Dry Mixed Prairie	1,400	1,100	800
Tenneco, moist	Loamy, Dry Mixed Prairie	1,600	1,200	800
BHE:				
Bissett	Limestone Hill and Mountain, Desert Grassland	700	600	500
Beach	Sandstone Hill and Mountain, Desert Grassland	1,000	750	500
BID:				
Bissett	Limestone Hill and Mountain, Desert Grassland	750	650	550

Table 6.--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
BIE:				
Bissett	Limestone Hill and Mountain, Desert Grassland	700	600	500
BIG:				
Bissett	Limestone Hill and Mountain, Desert Grassland	700	600	500
BRE:				
Bissett, moist	Limestone Hill, Dry Mixed Prairie	1,000	850	700
BRG:				
Bissett, moist	Limestone Hill, Dry Mixed Prairie	900	750	650
BSG:				
Bissett	Limestone Hill and Mountain, Desert Grassland	700	600	500
Beach	Sandstone Hill and Mountain, Desert Grassland	1,000	750	500
BVC:				
Bofecillos	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
Leyva	Igneous Hill and Mountain, Desert Grassland	1,200	1,000	750
BVE:				
Bofecillos	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
Leyva	Igneous Hill and Mountain, Desert Grassland	1,200	1,000	750
Horsetrap	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
CCE:				
Changas	Salty Clay Hill, Hot Desert Shrub	350	250	150
Corazones	Gravelly, Hot Desert Shrub	500	350	200
CHC:				
Chilicotal	Gravelly, Desert Grassland	800	600	400
CIB:				
Chillon	Gravelly, Hot Desert Shrub	600	400	200
CLA:				
Chipotle	Arroyo, Desert Grassland	1,500	1,200	900
COC:				
Chispa	Gravelly, Desert Grassland	850	650	450
Chilicotal	Gravelly, Desert Grassland	800	600	400

Table 6.--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
CPC:				
Chispa	Gravelly, Desert Grassland	850	650	450
Tenneco	Loamy, Desert Grassland	1,200	900	600
CTC:				
Corvus	Gyp Outcrop, Desert Grassland	380	245	120
Yesum	Gyp Upland, Desert Grassland	800	600	400
Peligro	Gyp Outcrop, Desert Grassland	380	245	120
CVC:				
Culberspeth	Gravelly, Desert Grassland	800	600	400
Chilicotal	Gravelly, Desert Grassland	800	600	400
CWC:				
Culberspeth, moist	Gravelly, Dry Mixed Prairie	1,200	1,000	700
Kahn, moist	Loamy, Dry Mixed Prairie	1,600	1,200	800
DEB:				
Dellahunt	Loamy, Desert Grassland	1,200	900	600
DNB:				
Dellahunt	Loamy, Desert Grassland	1,200	900	600
Neimahr	Loamy, Desert Grassland	1,200	900	600
Joberanch	Loamy, Desert Grassland	1,200	900	600
DOC:				
Double	Loamy, Desert Grassland	1,200	900	600
ELC:				
Elcor	Gyp Hill, Desert Grassland	350	250	150
ELE:				
Elcor	Gyp Hill, Desert Grassland	350	250	150
EPA:				
Elcor	Gyp Hill, Desert Grassland	350	250	150
Dellahunt	Loamy, Desert Grassland	1,200	900	600
Pokorny	Gyp Alluvium, Desert Grassland	600	400	300
EPE:				
Elcor	Gyp Hill, Desert Grassland	350	250	150
Pokorny	Gyp Alluvium, Desert Grassland	600	400	300
Walkerwells	Bottomland, Desert Grassland	5,000	3,750	2,500
Hollomex	Gyp Hill, Desert Grassland	400	300	200
GAA:				
Gypsic Aquisalids	Gyp Playa, Desert Shrub	50	5	0
HPC:				
Hollebeke	Gyp Hill, Desert Grassland	400	300	200
Pokorny	Gyp Alluvium, Desert Grassland	600	400	300
HRC:				
Horsetrap	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
Bofecillos	Igneous Hill and Mountain, Desert Grassland	1,000	800	600

Table 6.--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
KPB:				
Kinco	Sandy Loam, Desert Grassland	900	800	700
Aguena	Sand Hills, Desert Grassland	900	750	600
Perilla	Sandy Loam, Desert Grassland	900	800	700
LPG:				
Lampshire	Igneous Hill and Mountain, Desert Grassland	1,000	800	600
Pantak	Igneous Hill and Mountain, Desert Grassland	1,200	1,000	750
LRE:				
Lark	Vegetated Gypsum Dunes, Desert Shrub	450	300	150
MAB:				
McAllister	Loamy, Desert Grassland	1,200	900	600
MCB:				
Michigan	Loamy, Desert Grassland	1,200	900	600
MHA:				
Monahans	Sandy, Desert Shrub	650	450	250
OCB:				
Ojinaga	Gravelly, Hot Desert Shrub	400	250	100
Corazones	Gravelly, Hot Desert Shrub	500	350	200
OCF:				
Ojinaga	Gravelly, Hot Desert Shrub	400	250	100
Corazones	Gravelly, Hot Desert Shrub	500	350	200
PAG:				
Pantak	Igneous Hill and Mountain, Desert Grassland	1,200	1,000	750
PRA:				
Pantera	Arroyo, Hot Desert Shrub	1,200	900	600
RLA:				
Reyab, moist	Loamy, Dry Mixed Prairie	1,600	1,200	800
RSA:				
Reyab	Draw, Desert Grassland	1,200	800	650
RXG:				
Lampshire	Igneous Hill and Mountain, Desert Grassland	1,200	1,000	750
STB:				
Stovall	Loamy, Desert Grassland	1,500	1,200	900
TEC:				
Tenneco, moist	Loamy, Desert Grassland	1,200	900	600
VDA:				
Verhalen	Clay Flat, Desert Grassland	2,000	1,400	800
Dalby	Clay Flat, Desert Grassland	2,000	1,400	800

Table 6.--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
WAB:				
Walkerwells	Bottomland, Desert Grassland	5,000	3,750	2,500
YAG:				
Yarbam	Limestone Hill and Mountain, Mixed Prairie	1,200	900	700
YLA:				
Yesum	Gyp Upland, Desert Shrub	800	600	400
Loki	Gyp Upland, Desert Shrub	800	600	400
Corvus	Gyp Outcrop, Desert Shrub	380	245	120

Table 7.--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
AAD:			
Aguena	90	Somewhat limited	
		Sandy surface	0.50
		Dusty	0.50
ABE:			
Allamore	57	Somewhat limited	
		Slope	0.65
Beach	23	Very limited	
		Large stones	1.00
		Slope	0.65
		Dusty	0.50
		Surface stones	0.10
Rock outcrop	17	Not rated	
ABG:			
Allamore, moist	40	Very limited	
		Slope	1.00
Beach, moist	40	Very limited	
		Slope	1.00
		Dusty	0.50
Rock outcrop	15	Not rated	
ANB:			
Antbed	85	Not limited	
BBC:			
Beach	85	Somewhat limited	
		Dusty	0.50
BBD:			
Beach	80	Somewhat limited	
		Dusty	0.50
		Slope	0.13
BCE:			
Beach, moist	45	Somewhat limited	
		Slope	0.78
		Dusty	0.50
Allamore, moist	40	Somewhat limited	
		Slope	0.78

Table 7.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
BCG:			
Beach	35	Very limited	
		Slope	1.00
		Dusty	0.50
		Surface stones	0.10
Allamore	22	Very limited	
		Slope	1.00
Rock outcrop	19	Not rated	
BED:			
Beach, moist	65	Somewhat limited	
		Dusty	0.50
Tenneco, moist	25	Not limited	
BHE:			
Bissett	66	Very limited	
		Slope	1.00
Beach	22	Very limited	
		Slope	1.00
		Dusty	0.50
BID:			
Bissett	65	Somewhat limited	
		Slope	0.01
Rock outcrop	25	Not rated	
BIE:			
Bissett	65	Very limited	
		Slope	1.00
		Surface stones	0.03
Rock outcrop	30	Not rated	
BIG:			
Bissett	65	Very limited	
		Slope	1.00
Rock outcrop	25	Not rated	
BRE:			
Bissett, moist	75	Somewhat limited	
		Slope	0.06
Rock outcrop	20	Not rated	
BRG:			
Bissett, moist	75	Very limited	
		Slope	1.00
		Surface stones	0.35
Rock outcrop	20	Not rated	

Table 7.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
BSG:			
Bissett	40	Very limited	
		Slope	1.00
Rock outcrop	27	Not rated	
Beach	16	Very limited	
		Slope	1.00
		Dusty	0.50
BVC:			
Bofecillos	60	Somewhat limited	
		Dusty	0.50
Leyva	25	Not limited	
BVE:			
Bofecillos	37	Very limited	
		Slope	1.00
		Dusty	0.50
Leyva	33	Somewhat limited	
		Slope	0.94
		Surface stones	0.16
Horsetrap	17	Very limited	
		Slope	1.00
CCE:			
Changas	41	Very limited	
		Slope	1.00
		Water erosion	0.61
Corazones	17	Not limited	
CHC:			
Chilicotal	83	Not limited	
CIB:			
Chillon	85	Not limited	
CLA:			
Chipotle	63	Very limited	
		Flooding	1.00
		Sandy surface	0.50
		Dusty	0.50
		Too gravelly	0.35
Riverwash	22	Not rated	
COC:			
Chispa	55	Not limited	
Chilicotal	35	Not limited	

Table 7.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
CPC:			
Chispa	55	Not limited	
Tenneco	35	Not limited	
CTC:			
Corvus	35	Not limited	
Yesum	25	Not limited	
Peligro	25	Not limited	
CVC:			
Culberspeth	65	Not limited	
Chilicotal	30	Not limited	
CWC:			
Culberspeth, moist	60	Not limited	
Kahn, moist	35	Not limited	
DEB:			
Dellahunt	80	Not limited	
DNB:			
Dellahunt	30	Not limited	
Neimahr	25	Not limited	
Joberanch	25	Not limited	
DOC:			
Double	90	Not limited	
ELC:			
Elcor	95	Not limited	
ELE:			
Elcor	80	Somewhat limited	
		Slope	0.65
		Water erosion	0.65
EPA:			
Elcor	35	Not limited	
Dellahunt	30	Not limited	
Pokorny	25	Not limited	
EPE:			
Elcor	30	Very limited	
		Slope	1.00
		Water erosion	0.94
Pokorny	30	Not limited	
Walkerwells	15	Not limited	
Hollomex	15	Not limited	
GAA:			
Gypsic Aquisalids	95	Not limited	
HPC:			
Hollebeke	45	Not limited	
Pokorny	35	Not limited	

Table 7.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
HRC:			
Horsetrap	39	Not limited	
Bofecillos	39	Somewhat limited	
		Dusty	0.50
KPB:			
Kinco	43	Somewhat limited	
		Sandy surface	0.50
Aguena	27	Somewhat limited	
		Sandy surface	0.50
		Dusty	0.50
Perilla	17	Not limited	
LPG:			
Lampshire	50	Very limited	
		Slope	1.00
		Dusty	0.50
		Surface stones	0.39
Pantak	35	Somewhat limited	
		Slope	0.65
LRE:			
Lark	95	Somewhat limited	
		Sandy surface	0.50
		Dusty	0.50
		Slope	0.22
MAB:			
McAllister	85	Not limited	
MCB:			
Michigan	90	Somewhat limited	
		Too clayey	0.25
MHA:			
Monahans	85	Somewhat limited	
		Sandy surface	0.50
OCB:			
Ojinaga	57	Not limited	
Corazones	28	Not limited	
OCF:			
Ojinaga	55	Not limited	
Corazones	36	Very limited	
		Slope	1.00
		Too gravelly	0.78

Table 7.--Ranch Access Roads--Continued

Map symbol and soil name	Pct. of map unit	Ranch Access Roads: Rating class and limiting features	Value
PAG:			
Pantak	74	Very limited	
		Slope	1.00
Rock outcrop	19	Not rated	
PRA:			
Pantera	63	Very limited	
		Flooding	1.00
		Sandy surface	0.50
		Dusty	0.50
Riverwash	22	Not rated	
RLA:			
Reyab, moist	85	Not limited	
RSA:			
Reyab	90	Not limited	
RXG:			
Rock outcrop	75	Not rated	
Lampshire	20	Very limited	
		Slope	1.00
		Dusty	0.50
STB:			
Stovall	90	Not limited	
TEC:			
Tenneco, moist	85	Not limited	
VDA:			
Verhalen	65	Somewhat limited	
		Dusty	0.50
		Too clayey	0.25
Dalby	25	Somewhat limited	
		Dusty	0.50
WAB:			
Walkerwells	80	Not limited	
YAG:			
Yarbam	60	Very limited	
		Slope	1.00
		Dusty	0.50
Rock outcrop	30	Not rated	
YLA:			
Yesum	50	Not limited	
Loki	27	Not limited	
Corvus	16	Not limited	

Table 8.--Grazing Land Pipelines and Fencing

(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
AAD:							
Aguena	90	Somewhat limited		Not limited		Not limited	
		Unstable excavation walls	0.40				
ABE:							
Allamore	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	0.65	Slope	0.65	Slope	0.65
		Large stones	0.16	Large stones	0.16	Large stones	0.16
		Unstable excavation walls	0.10	Too clayey	0.01	Too clayey	0.01
		Too clayey	0.01				
Beach	23	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	Slope	0.65	Slope	0.65
		Large stones	0.39	Large stones	0.39	Large stones	0.39
		Unstable excavation walls	0.10	Large stones	0.02	Large stones	0.02
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
Rock outcrop	17	Not rated		Not rated		Not rated	
ABG:							
Allamore, moist	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	0.65	Slope	0.65
		Unstable excavation walls	0.10	Large stones	0.16	Large stones	0.16
		Too clayey	0.06	Too clayey	0.01	Too clayey	0.01
Beach, moist	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
		Unstable excavation walls	0.10				
Rock outcrop	15	Not rated		Not rated		Not rated	
ANB:							
Antbed	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.71	Too clayey	0.71	Too clayey	0.71
		High shrink-swell	0.39	Very high shrink-swell	0.06	Very high shrink-swell	0.06
		Unstable excavation walls	0.10				

Table 8.--Grazing Land Pipelines and Fencing--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
BBC:							
Beach	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				
BBD:							
Beach	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	0.13	Too gravelly	0.27	Too gravelly	0.27
		Unstable excavation walls	0.10	Slope	0.13	Slope	0.13
BCE:							
Beach, moist	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	0.78	Slope	0.78	Slope	0.78
		Unstable excavation walls	0.10	Too clayey	0.04	Too clayey	0.04
		Too clayey	0.04				
Allamore, moist	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	Slope	0.78	Slope	0.78
		Unstable excavation walls	0.10	Too gravelly	0.15	Too gravelly	0.15
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
BCG:							
Beach	35	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	0.39	Large stones	0.39
		Unstable excavation walls	0.10				
Allamore	22	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	0.01	Too clayey	0.01	Too clayey	0.01
Rock outcrop	19	Not rated		Not rated		Not rated	

Table 8.--Grazing Land Pipelines and Fencing--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
BED:							
Beach, moist--------	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	0.74	Too gravelly	0.74
Tenneco, moist------	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.11	Too clayey	0.11	Too clayey	0.11
		Unstable excavation walls	0.10				
		High shrink-swell	0.01				
BHE:							
Bissett----------	66	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	0.92	Too gravelly	0.92
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
Beach----------	22	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	0.61	Too gravelly	0.61
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
BID:							
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	Slope	1.00	Slope	1.00
		Too clayey	0.07	Too gravelly	0.92	Too gravelly	0.92
		Slope	0.01				
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIE:							
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
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.12	Large stones	0.12	Large stones	0.12
		Unstable excavation walls	0.10	Too clayey	0.07	Too clayey	0.07
		Too clayey	0.07	Too gravelly	0.03	Too gravelly	0.03
Rock outcrop--------	30	Not rated		Not rated		Not rated	

Table 8.--Grazing Land Pipelines and Fencing--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
BIG:							
Bissett----------	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
		Large stones	0.95	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Large stones	0.95	Large stones	0.95
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BRE:							
Bissett, moist------	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	0.44	Too gravelly	0.44
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
		Slope	0.06	Slope	0.06	Slope	0.06
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BRG:							
Bissett, moist------	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	0.95	Large stones	0.95	Large stones	0.95
		Unstable excavation walls	0.10	Too clayey	0.06	Too clayey	0.06
		Too clayey	0.06				
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BSG:							
Bissett----------	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
		Unstable excavation walls	0.10	Too gravelly	0.84	Too gravelly	0.84
		Too clayey	0.07	Too clayey	0.07	Too clayey	0.07
Rock outcrop--------	27	Not rated		Not rated		Not rated	
Beach----------	16	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	0.61	Too gravelly	0.61

Table 8.--Grazing Land Pipelines and Fencing--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
BVC:							
Bofecillos----------	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
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02
Leyva----------	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
		Too clayey	0.81	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.10	Too clayey	0.81	Too clayey	0.81
BVE:							
Bofecillos----------	37	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	0.97	Too gravelly	0.97
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02
Leyva----------	33	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	0.81	Slope	0.94	Slope	0.94
		Large stones	0.61	Too clayey	0.81	Too clayey	0.81
		Unstable excavation walls	0.10	Large stones	0.61	Large stones	0.61
Horsetrap----------	17	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 clayey	0.06	Too clayey	0.06
		Too clayey	0.06	Large stones	0.01	Large stones	0.01
		Large stones	0.01				
CCE:							
Changas----------	41	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.86	Too clayey	0.86	Too clayey	0.86
		High shrink-swell	0.50	Very high shrink-swell	0.22	Very high shrink-swell	0.21
		Unstable excavation walls	0.10				
Corazones----------	17	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 8.--Grazing Land Pipelines and Fencing--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
CHC:							
Chilicotal----------	83	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.40	Too gravelly	0.92	Too gravelly	0.92
		High shrink-swell	0.01	Too clayey	0.01	Too clayey	0.01
		Too clayey	0.01				
CIB:							
Chillon----------	85	Somewhat limited		Very limited		Very limited	
		Unstable excavation walls	0.40	Too gravelly	1.00	Too gravelly	1.00
		Large stones	0.01	Large stones	0.01	Too Sandy	0.50
		High shrink-swell	0.01			Large stones	0.01
CLA:							
Chipotle----------	63	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 acid	0.02	Too acid	0.02
Riverwash----------	22	Not rated		Not rated		Not rated	
COC:							
Chispa----------	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.40	Too gravelly	0.12	Too gravelly	0.12
		Too clayey	0.04	Too clayey	0.04	Too clayey	0.04
		High shrink-swell	0.01				
Chilicotal----------	35	Somewhat limited		Very limited		Very limited	
		Unstable excavation walls	0.40	Too gravelly	1.00	Too gravelly	1.00
		High shrink-swell	0.01				
CPC:							
Chispa----------	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.16	Too clayey	0.16	Too clayey	0.16
		Unstable excavation walls	0.10				
		High shrink-swell	0.01				
Tenneco----------	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Too clayey	0.07	Too clayey	0.22
		Too clayey	0.07				
		High shrink-swell	0.01				
CTC:							
Corvus----------	35	Somewhat limited		Somewhat limited		Somewhat limited	
		High shrink-swell	0.50	Excess salt	0.50	Excess salt	0.50
		Unstable excavation walls	0.10				

Table 8.--Grazing Land Pipelines and Fencing--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
Yesum	25	Somewhat limited		Not limited		Not limited	
		Unstable excavation walls	0.10				
		High shrink-swell	0.01				
Peligro	25	Somewhat limited		Not limited		Not limited	
		Unstable excavation walls	0.40				
CVC:							
Culberspeth	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Too clayey	0.06	Too clayey	0.06
		Too clayey	0.06	Too gravelly	0.01	Too gravelly	0.01
Chilicotal	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.40	Too gravelly	0.88	Too gravelly	0.88
		Too clayey	0.09	Too clayey	0.09	Too clayey	0.09
		High shrink-swell	0.01				
CWC:							
Culberspeth, moist	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Too clayey	0.02	Too clayey	0.02
		Too clayey	0.02				
Kahn, moist	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Too clayey	0.02	Too clayey	0.09
		Too clayey	0.02				
		High shrink-swell	0.01				
DEB:							
Dellahunt	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		Too clayey	0.19	Too clayey	0.19	Too clayey	0.19
		Unstable excavation walls	0.10				
		High shrink-swell	0.01				
DNB:							
Dellahunt	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.14	Too clayey	0.14	Too clayey	0.14
		Unstable excavation walls	0.10				
		High shrink-swell	0.01				
Neimahr	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
		Too clayey	0.16	Too clayey	0.16	Too clayey	0.16
		Unstable excavation walls	0.10				

Table 8.--Grazing Land Pipelines and Fencing--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
Joberanch	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.11	Too clayey	0.11	Too clayey	0.11
		Unstable excavation walls	0.10				
DOC:							
Double	90	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	0.01	Very high shrink-swell	0.01
		High shrink-swell	0.04				
ELC:							
Elcor	95	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				
ELE:							
Elcor	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	0.65	Slope	0.65	Slope	0.65
		excavation walls					
		Too clayey	0.01				
EPA:							
Elcor	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
		Unstable excavation walls	0.10				
Dellahunt	30	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				
Pokorny	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Too clayey	0.09	Too clayey	0.09
		Too clayey	0.09				
EPE:							
Elcor	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	1.00	Slope	1.00	Slope	1.00
		Unstable excavation walls	0.10	Too clayey	0.01	Too clayey	0.01
		Too clayey	0.01				

Table 8.--Grazing Land Pipelines and Fencing--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
Pokorny----------	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.13	Too clayey	0.13	Too clayey	0.13
		Unstable excavation walls	0.10				
Walkerwells---------	15	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	0.16	Too clayey	0.16
		Too clayey	0.16	Very high shrink-swell	0.06	Very high shrink-swell	0.06
		Unstable excavation walls	0.10				
Hollomex----------	15	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Too clayey	0.02	Too clayey	0.02
		Too clayey	0.02				
		High shrink-swell	0.01				
GAA:							
Gypsic Aquisalids---	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		Too clayey	0.16	Excess salt	0.50	Excess salt	0.50
		Unstable excavation walls	0.10	Too clayey	0.16	Too clayey	0.16
		High shrink-swell	0.01				
HPC:							
Hollebeke----------	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				
Pokorny----------	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.13	Too clayey	0.13	Too clayey	0.13
		Unstable excavation walls	0.10				
HRC:							
Horsetrap----------	39	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	0.92	Too gravelly	0.92
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
Bofecillos----------	39	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	0.97	Too gravelly	0.97
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01

Table 8.--Grazing Land Pipelines and Fencing--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
KPB:							
Kinco	43	Somewhat limited		Not limited		Not limited	
		Unstable excavation walls	0.40				
		High shrink-swell	0.01				
Aguena	27	Somewhat limited		Not limited		Not limited	
		Unstable excavation walls	0.40				
Perilla	17	Somewhat limited		Not limited		Not limited	
		Unstable excavation walls	0.10				
		High shrink-swell	0.01				
LPG:							
Lampshire	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	1.00	Slope	1.00	Slope	1.00
		Large stones	0.97	Large stones	0.97	Large stones	0.97
		Unstable excavation walls	0.10				
Pantak	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	0.65	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.16	Slope	0.65	Slope	0.65
		Unstable excavation walls	0.10	Too clayey	0.16	Too clayey	0.16
LRE:							
Lark	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.40	Too Sandy	0.50	Too Sandy	0.50
		Slope	0.22	Slope	0.22	Slope	0.22
MAB:							
McAllister	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.14	Too clayey	0.14	Too clayey	0.14
		Unstable excavation walls	0.10	Very high shrink-swell	0.01	Very high shrink-swell	0.01
		High shrink-swell	0.08				
MCB:							
Michigan	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.67	Too clayey	0.67	Too clayey	0.67
		High shrink-swell	0.50	Very high shrink-swell	0.12	Very high shrink-swell	0.12
		Unstable excavation walls	0.10				

Table 8.--Grazing Land Pipelines and Fencing--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
MHA:							
Monahans	85	Somewhat limited		Not limited		Not limited	
		Unstable excavation walls	0.10				
		High shrink-swell	0.01				
OCB:							
Ojinaga	57	Somewhat limited		Very limited		Very limited	
		Unstable excavation walls	0.10	Too gravelly	1.00	Too gravelly	1.00
		Too clayey	0.01	Too clayey	0.01	Too clayey	0.01
Corazones	28	Somewhat limited		Very limited		Very limited	
		Unstable excavation walls	0.40	Too gravelly	1.00	Too gravelly	1.00
		High shrink-swell	0.01				
OCF:							
Ojinaga	55	Somewhat limited		Very limited		Very limited	
		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
Corazones	36	Very limited		Very limited		Very limited	
		Slope	1.00	Too gravelly	1.00	Too gravelly	1.00
		Unstable excavation walls	0.40	Slope	1.00	Slope	1.00
		Too clayey	0.04	Too clayey	0.04	Too clayey	0.04
		High shrink-swell	0.01				
PAG:							
Pantak	74	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	0.22	Too gravelly	0.79	Too gravelly	0.79
		Large stones	0.12	Too clayey	0.22	Too clayey	0.22
		Unstable excavation walls	0.10	Large stones	0.12	Large stones	0.12
Rock outcrop	19	Not rated		Not rated		Not rated	
PRA:							
Pantera	63	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
Riverwash	22	Not rated		Not rated		Not rated	

Table 8.--Grazing Land Pipelines and Fencing--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
RLA:							
Reyab, moist--------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		High shrink-swell	0.12	Too clayey	0.11	Too clayey	0.11
		Too clayey	0.11	Very high shrink-swell	0.03	Very high shrink-swell	0.03
		Unstable excavation walls	0.10				
RSA:							
Reyab----------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Occasional flooding	0.70	Occasional flooding	0.70	Occasional flooding	0.70
		Too clayey	0.19	Too clayey	0.19	Too clayey	0.28
		High shrink-swell	0.14	Very high shrink-swell	0.02	Very high shrink-swell	0.02
		Unstable excavation walls	0.10				
RXG:							
Rock outcrop--------	75	Not rated		Not rated		Not rated	
Lampshire----------	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
		Unstable excavation walls	0.10	Too gravelly	0.87	Too gravelly	0.87
STB:							
Stovall----------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		High shrink-swell	0.39	Too clayey	0.29	Too clayey	0.29
		Too clayey	0.29	Very high shrink-swell	0.06	Very high shrink-swell	0.06
		Unstable excavation walls	0.10				
TEC:							
Tenneco, moist------	85	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				
VDA:							
Verhalen----------	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.93	Too clayey	0.93	Too clayey	0.99
		Unstable excavation walls	0.90	Rare flooding	0.50	Rare flooding	0.50
		Rare flooding	0.50	Very high shrink-swell	0.48	Very high shrink-swell	0.48
		High shrink-swell	0.50				

Table 8.--Grazing Land Pipelines and Fencing--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
Dalby----------	25	Very limited		Very limited		Very limited	
		Too clayey	0.99	Too clayey	0.99	Too clayey	0.99
		Unstable excavation walls	0.90	Rare flooding	0.50	Rare flooding	0.50
		Rare flooding	0.50	Very high shrink-swell	0.46	Very high shrink-swell	0.46
		High shrink-swell	0.50				
WAB:							
Walkerwells---------	80	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	0.25	Too clayey	0.55
		Too clayey	0.25	Very high shrink-swell	0.06	Very high shrink-swell	0.06
		Unstable excavation walls	0.10				
YAG:							
Yarbam----------	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	0.81	Too gravelly	0.81
		Too clayey	0.06	Too clayey	0.06	Too clayey	0.06
Rock outcrop--------	30	Not rated		Not rated		Not rated	
YLA:							
Yesum----------	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Too clayey	0.01	Too clayey	0.01
		Too clayey	0.01				
		High shrink-swell	0.01				
Loki----------	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Too clayey	0.06	Too clayey	0.06
		Too clayey	0.06	Very high shrink-swell	0.01	Very high shrink-swell	0.01
		High shrink-swell	0.01				
Corvus----------	16	Somewhat limited		Somewhat limited		Somewhat limited	
		Unstable excavation walls	0.10	Excess salt	0.50	Excess salt	0.50
		Too clayey	0.02	Too clayey	0.02	Too clayey	0.02

Table 9.--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
AAD:							
Aguena	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.44	Too sandy	0.44	Too sandy	0.44
						Slope	0.13
ABE:							
Allamore	57	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	0.34	Gravel content	0.34	Slope	1.00
		Dusty	0.27	Dusty	0.27	Dusty	0.50
Beach	23	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	Slope	1.00
		Large stones content	0.23	Large stones content	0.23	Gravel	0.63
		Dusty	0.05	Dusty	0.05	Large stones content	0.23
Rock outcrop	17	Not rated		Not rated		Not rated	
ABG:							
Allamore, moist	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Gravel	0.99	Gravel content	0.99	Depth to bedrock	1.00
		Dusty	0.30	Dusty	0.30	Dusty	0.50
Beach, moist	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Dusty	0.25	Dusty	0.25	Depth to bedrock	1.00
		Gravel	0.19	Gravel content	0.19		
Rock outcrop	15	Not rated		Not rated		Not rated	
ANB:							
Antbed	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.35	Dusty	0.35	Dusty	0.50
		Slow water movement	0.06	Slow water movement	0.06	Slow water movement	0.06
BBC:							
Beach	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.03	Dusty	0.03	Gravel	1.00
		Gravel	0.01	Gravel content	0.01	Slope	0.88

Table 9.--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
BBD:							
Beach	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel	1.00
		Gravel	0.89	Gravel content	0.89	Depth to bedrock	1.00
		Slope	0.37	Slope	0.37	Slope	1.00
		Dusty	0.03	Dusty	0.03		
BCE:							
Beach, moist	45	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	1.00
		Dusty	0.31	Dusty	0.31	Slope	1.00
		Gravel	0.08	Gravel content	0.08	Dusty	0.50
Allamore, moist	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	0.78	Gravel content	0.78	Slope	1.00
		Dusty	0.28	Dusty	0.28	Dusty	0.50
BCG:							
Beach	35	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	0.10	Large stones content	0.10	Gravel	1.00
		Dusty	0.04	Dusty	0.04	Large stones content	0.10
Allamore	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Gravel	0.99	Gravel content	0.99	Depth to bedrock	1.00
		Dusty	0.11	Dusty	0.11	Dusty	0.50
Rock outcrop	19	Not rated		Not rated		Not rated	
BED:							
Beach, moist	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel	1.00
		Gravel	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Dusty	0.27	Dusty	0.27	Slope	1.00
Tenneco, moist	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.33	Dusty	0.33	Slope	1.00
						Dusty	0.50
BHE:							
Bissett	66	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00	Gravel	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	0.25	Dusty	0.25	Dusty	0.50

Table 9.--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
Beach	22	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel	0.99	Gravel content	0.99	Depth to bedrock	1.00
		Dusty	0.43	Dusty	0.43	Dusty	0.50
BID:							
Bissett	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel	1.00
		Gravel	0.68	Gravel content	0.68	Depth to bedrock	1.00
		Dusty	0.30	Dusty	0.30	Slope	1.00
		Slope	0.04	Slope	0.04	Dusty	0.50
Rock outcrop	25	Not rated		Not rated		Not rated	
BIE:							
Bissett	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Gravel	0.53	Gravel content	0.53	Depth to bedrock	1.00
		Dusty	0.26	Dusty	0.26	Dusty	0.50
		Large stones content	0.03	Large stones content	0.03	Large stones content	0.03
Rock outcrop	30	Not rated		Not rated		Not rated	
BIG:							
Bissett	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Gravel	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	0.50
Rock outcrop	25	Not rated		Not rated		Not rated	
BRE:							
Bissett, moist	75	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel	1.00
		Gravel	0.93	Gravel content	0.93	Depth to bedrock	1.00
		Dusty	0.26	Dusty	0.26	Slope	1.00
		Slope	0.16	Slope	0.16	Dusty	0.50
Rock outcrop	20	Not rated		Not rated		Not rated	
BRG:							
Bissett, moist	75	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	0.46	Dusty	0.46	Dusty	0.50
		Large stones content	0.35	Large stones content	0.35	Large stones content	0.35
						Gravel	0.11
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 9.--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
BSG:							
Bissett----------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Gravel	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	0.50
Rock outcrop--------	27	Not rated		Not rated		Not rated	
Beach----------	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Gravel	0.99	Gravel content	0.99	Depth to bedrock	1.00
		Dusty	0.27	Dusty	0.27	Dusty	0.50
BVC:							
Bofecillos----------	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel	1.00
		Gravel	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Dusty	0.29	Dusty	0.29	Slope	0.88
						Dusty	0.50
Leyva----------	25	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00	Gravel	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.42	Dusty	0.42	Slope	0.88
		Slow water movement	0.35	Slow water movement	0.35	Slow water movement	0.35
BVE:							
Bofecillos----------	37	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel	1.00
		Gravel	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		
Leyva----------	33	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	0.41	Dusty	0.41	Gravel	0.79
		Slow water movement	0.35	Slow water movement	0.35	Slow water movement	0.35
		Large stones content	0.16	Large stones content	0.16	Large stones content	0.16
Horsetrap----------	17	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
		Slow water movement	0.26	Slow water movement	0.26	Gravel	1.00
		Dusty	0.12	Dusty	0.12	Slow water movement	0.26
		Gravel	0.01	Gravel content	0.01		

Table 9.--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
CCE:							
Changas	41	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50		
Corazones	17	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00	Gravel	1.00
		Dusty	0.26	Dusty	0.26	Dusty	0.50
						Slope	0.13
CHC:							
Chilicotal	83	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00	Gravel	1.00
		Dusty	0.27	Dusty	0.27	Dusty	0.50
						Slope	0.13
CIB:							
Chillon	85	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00	Gravel	1.00
		Dusty	0.03	Dusty	0.03		
CLA:							
Chipotle	63	Very limited		Very limited		Very limited	
		Flooding	1.00	Gravel content	1.00	Gravel	1.00
		Gravel	1.00	Flooding	0.40	Flooding	1.00
		Too sandy	0.30	Too sandy	0.30	Too sandy	0.30
Riverwash	22	Not rated		Not rated		Not rated	
COC:							
Chispa	55	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.11	Dusty	0.11	Gravel	1.00
		Gravel	0.05	Gravel content	0.05	Slope	0.13
Chilicotal	35	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00	Gravel	1.00
		Dusty	0.04	Dusty	0.04	Slope	0.88
CPC:							
Chispa	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.13	Dusty	0.13	Slope	0.13
Tenneco	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.18	Dusty	0.18	Slope	0.88
						Dusty	0.50
CTC:							
Corvus	35	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	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.13

Table 9.--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
Yesum	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.88
Peligro	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.88
CVC:							
Culberspeth	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
		Gravel	0.32	Gravel content	0.32	Gravel	1.00
		Dusty	0.30	Dusty	0.30	Slope	0.88
						Dusty	0.50
Chilicotal	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.31	Dusty	0.31	Slope	0.88
						Dusty	0.50
						Gravel	0.11
CWC:							
Culberspeth, moist	60	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Dusty	0.28	Dusty	0.28	Gravel	0.99
						Slope	0.88
						Dusty	0.50
Kahn, moist	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.20	Dusty	0.20	Slope	0.88
						Dusty	0.50
DEB:							
Dellahunt	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50			Dusty	0.50
DNB:							
Dellahunt	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.43	Dusty	0.43	Dusty	0.50
Neimahr	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.28	Dusty	0.28	Dusty	0.50
Joberanch	25	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Dusty	0.32	Dusty	0.32	Dusty	0.50
DOC:							
Double	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.30	Dusty	0.30	Slope	0.88
						Dusty	0.50

Table 9.--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
ELC:							
Elcor	95	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Slope	0.88
						Dusty	0.50
ELE:							
Elcor	80	Very limited		Very limited		Very limited	
		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	0.50	Dusty	0.50	Dusty	0.50
EPA:							
Elcor	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Dellahunt	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Pokorny	25	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
EPE:							
Elcor	30	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	0.50	Dusty	0.50	Dusty	0.50
Pokorny	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
		Dusty	0.50	Dusty	0.50		
Walkerwells	15	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.46	Flooding	0.60
		Dusty	0.46	Slow water movement	0.41	Dusty	0.50
		Slow water movement	0.41			Slow water movement	0.41
Hollomex	15	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.88
						Dusty	0.50
GAA:							
Gypsic Aquisalids	95	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Salinity	1.00	Salinity	1.00	Salinity	1.00
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50	Slow water movement	0.26	Dusty	0.50
		Slow water movement	0.26			Slow water movement	0.26

Table 9.--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
HPC:							
Hollebeke	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	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Slope	0.88
						Dusty	0.50
Pokorny	35	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Dusty	0.50	Dusty	0.50	Slope	0.88
						Dusty	0.50
HRC:							
Horsetrap	39	Very limited		Very limited		Very limited	
		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	Gravel	0.99
		Dusty	0.04	Dusty	0.04	Slope	0.50
						Slow water movement	0.26
Bofecillos	39	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel	1.00
		Gravel	1.00	Gravel content	1.00	Depth to bedrock	1.00
		Dusty	0.04	Dusty	0.04	Slope	0.88
KPB:							
Kinco	43	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.85	Too sandy	0.85	Too sandy	0.85
Aguena	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.44	Too sandy	0.44	Too sandy	0.44
Perilla	17	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.01	Dusty	0.01		
LPG:							
Lampshire	50	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	0.39	Large stones content	0.39	Gravel	1.00
		Gravel	0.09	Gravel content	0.09	Large stones content	0.39
		Dusty	0.04	Dusty	0.04		
Pantak	35	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00	Gravel	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	0.24	Dusty	0.24		
LRE:							
Lark	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Dusty	0.50	Dusty	0.50		

Table 9.--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
MAB:							
McAllister----------	85	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.09	Dusty	0.09		
MCB:							
Michigan----------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Dusty	0.42	Dusty	0.42		
MHA:							
Monahans----------	85	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
		Dusty	0.50	Dusty	0.50		
OCB:							
Ojinaga----------	57	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Gravel	0.43	Gravel content	0.43	Gravel	1.00
		Dusty	0.14	Dusty	0.14	Dusty	0.50
Corazones----------	28	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00	Gravel	1.00
		Too sandy	0.01	Too sandy	0.01	Too sandy	0.01
OCF:							
Ojinaga----------	55	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel	1.00
		Gravel	1.00	Gravel content	1.00	Depth to cemented pan	1.00
		Dusty	0.13	Dusty	0.13		
Corazones----------	36	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel content	1.00	Gravel	1.00
		Dusty	0.12	Dusty	0.12		
PAG:							
Pantak----------	74	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Gravel	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	0.09	Dusty	0.09		
Rock outcrop--------	19	Not rated		Not rated		Not rated	
PRA:							
Pantera----------	63	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Too sandy	0.77	Flooding	1.00
		Too sandy	0.77	Flooding	0.40	Gravel	0.96
						Too sandy	0.77
Riverwash----------	22	Not rated		Not rated		Not rated	

Table 9.--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
RLA:							
Reyab, moist--------	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.40	Flooding	0.60
		Dusty	0.40			Dusty	0.50
RSA:							
Reyab----------	90	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50			Dusty	0.50
RXG:							
Rock outcrop--------	75	Not rated		Not rated		Not rated	
Lampshire----------	20	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel content	1.00	Gravel	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	0.01	Dusty	0.01		
STB:							
Stovall----------	90	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.44	Dusty	0.44		
TEC:							
Tenneco, moist------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.44	Dusty	0.44	Slope	0.88
						Dusty	0.50
VDA:							
Verhalen----------	65	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too clayey	0.50	Too clayey	0.50
		Too clayey	0.50	Dusty	0.50	Slow water movement	0.45
		Dusty	0.50	Slow water movement	0.45		
		Slow water movement	0.45				
Dalby----------	25	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Slow water movement	0.45
		Dusty	0.50	Slow water movement	0.45		
		Slow water movement	0.45				
WAB:							
Walkerwells---------	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50	Slow water movement	0.41	Slow water movement	0.41
		Slow water movement	0.41				

Table 9.--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
YAG:							
Yarbam	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel	1.00
		Gravel	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	0.31	Dusty	0.31	Dusty	0.50
Rock outcrop	30	Not rated		Not rated		Not rated	
YLA:							
Yesum	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Loki	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Corvus	16	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	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50

Table 10.--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
AAD:							
Aguena	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.44	Too sandy	0.44	Droughty	0.09
ABE:							
Allamore	57	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.99
						Gravel	0.34
						Large stones	0.26
Beach	23	Somewhat limited		Somewhat limited		Very limited	
		Large stones content	0.23	Large stones content	0.23	Depth to bedrock	1.00
						Large stones	1.00
						Droughty	1.00
						Slope	1.00
Rock outcrop	17	Not rated		Not rated		Not rated	
ABG:							
Allamore, moist	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Slope	1.00
						Droughty	1.00
						Gravel	0.99
						Large stones	0.01
Beach, moist	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
						Large stones	0.54
						Gravel	0.19
Rock outcrop	15	Not rated		Not rated		Not rated	
ANB:							
Antbed	85	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
BBC:							
Beach	85	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Large stones	0.92
						Gravel	0.01

Table 10.--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
BBD:							
Beach----------	80	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Gravel	0.89
						Slope	0.37
						Large stones	0.01
BCE:							
Beach, moist--------	45	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
		Slope	0.02			Droughty	1.00
						Slope	1.00
						Large stones	0.74
						Gravel	0.08
Allamore, moist-----	40	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Droughty	1.00
		Slope	0.02			Depth to bedrock	1.00
						Slope	1.00
						Gravel	0.78
						Large stones	0.20
BCG:							
Beach----------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Large stones	0.10	Large stones	0.10	Slope	1.00
		content		content			
						Large stones	1.00
						Droughty	1.00
Allamore----------	22	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Droughty	1.00
						Depth to bedrock	1.00
						Gravel	0.99
Rock outcrop--------	19	Not rated		Not rated		Not rated	
BED:							
Beach, moist--------	65	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Gravel	1.00
Tenneco, moist------	25	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
BHE:							
Bissett----------	66	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.50	Droughty	1.00
		Dusty	0.50			Depth to bedrock	1.00
						Gravel	1.00
						Slope	1.00
						Carbonate content	1.00

Table 10.--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
Beach----------	22	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.50	Depth to bedrock	1.00
		Dusty	0.50			Droughty	1.00
						Slope	1.00
						Gravel	0.99
BID:							
Bissett----------	65	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
						Droughty	1.00
						Carbonate content	1.00
						Gravel	0.68
						Large stones	0.68
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIE:							
Bissett----------	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Dusty	0.50	Droughty	1.00
		Dusty	0.50	Large stones content	0.03	Depth to bedrock	1.00
		Large stones content	0.03			Slope	1.00
						Large stones	1.00
						Carbonate content	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Droughty	1.00
						Depth to bedrock	1.00
						Gravel	1.00
						Carbonate content	1.00
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BRE:							
Bissett, moist------	75	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
						Droughty	1.00
						Carbonate content	1.00
						Gravel	0.93
						Large stones	0.61
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BRG:							
Bissett, moist------	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Droughty	1.00
		Large stones content	0.35	Large stones content	0.35	Depth to bedrock	1.00
						Large stones	1.00
						Carbonate content	1.00

Table 10.--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
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BSG:							
Bissett----------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
						Droughty	1.00
						Gravel	1.00
						Carbonate content	1.00
Rock outcrop--------	27	Not rated		Not rated		Not rated	
Beach----------	16	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Slope	1.00
						Droughty	1.00
						Gravel	0.99
BVC:							
Bofecillos----------	60	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
						Droughty	1.00
						Gravel	1.00
Leyva----------	25	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Gravel	1.00
						Large stones	0.16
BVE:							
Bofecillos----------	37	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Depth to bedrock	1.00
						Droughty	1.00
						Gravel	1.00
						Slope	1.00
Leyva----------	33	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.18	Large stones content	0.16	Large stones	1.00
		Large stones content	0.16			Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
Horsetrap----------	17	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Large stones	0.68
						Gravel	0.01
CCE:							
Changas----------	41	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
						Sodium content	1.00

Table 10.--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
Corazones----------	17	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Gravel	1.00
						Droughty	0.68
						Large stones	0.32
CHC:							
Chilicotal----------	83	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Gravel	1.00
						Droughty	0.18
CIB:							
Chillon----------	85	Not limited		Not limited		Very limited	
						Droughty	1.00
						Gravel	1.00
						Large stones	0.92
CLA:							
Chipotle----------	63	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Droughty	1.00
		Too sandy	0.30	Too sandy	0.30	Gravel	1.00
Riverwash----------	22	Not rated		Not rated		Not rated	
COC:							
Chispa----------	55	Not limited		Not limited		Somewhat limited	
						Gravel	0.05
Chilicotal----------	35	Not limited		Not limited		Very limited	
						Gravel	1.00
						Droughty	0.14
CPC:							
Chispa----------	55	Not limited		Not limited		Not limited	
Tenneco----------	35	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
CTC:							
Corvus----------	35	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to cemented pan	1.00
						Droughty	1.00
						Sodium content	1.00
Yesum----------	25	Not limited		Not limited		Not limited	
Peligro----------	25	Not limited		Not limited		Very limited	
						Droughty	1.00
CVC:							
Culberspeth---------	65	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel	0.32

Table 10.--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
Chilicotal----------	30	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
CWC:							
Culberspeth, moist--	60	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to cemented pan	1.00
						Droughty	0.39
Kahn, moist---------	35	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
DEB:							
Dellahunt----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
DNB:							
Dellahunt----------	30	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Neimahr----------	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
						Droughty	0.65
Joberanch----------	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to cemented pan	1.00
						Droughty	1.00
DOC:							
Double----------	90	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
ELC:							
Elcor----------	95	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Droughty	1.00
						Depth to bedrock	1.00
ELE:							
Elcor----------	80	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Droughty	1.00
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
						Slope	1.00
EPA:							
Elcor----------	35	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
						Droughty	1.00
Dellahunt----------	30	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Pokorny----------	25	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to cemented pan	1.00
						Droughty	0.77

Table 10.--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
EPE:							
Elcor	30	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Droughty	1.00
		Slope	0.50	Dusty	0.50	Depth to bedrock	1.00
		Dusty	0.50			Slope	1.00
Pokorny	30	Not limited		Not limited		Very limited	
						Depth to cemented pan	1.00
						Droughty	0.96
Walkerwells	15	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
Hollomex	15	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Droughty	0.08
GAA:							
Gypsic Aquisalids	95	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Salinity	1.00
						Sodium content	1.00
						Flooding	0.60
HPC:							
Hollebeke	45	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to cemented pan	1.00
						Droughty	1.00
						Depth to bedrock	1.00
Pokorny	35	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to cemented pan	1.00
						Droughty	0.45
HRC:							
Horsetrap	39	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	1.00
Bofecillos	39	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Gravel	1.00
KPB:							
Kinco	43	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.85	Too sandy	0.85	Too sandy	0.50
Aguena	27	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.44	Too sandy	0.44	Droughty	0.09
Perilla	17	Not limited		Not limited		Not limited	

Table 10.--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
LPG:							
Lampshire	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Large stones content	0.39	Depth to bedrock	1.00
		Large stones content	0.39			Droughty	1.00
						Large stones	1.00
						Slope	1.00
						Gravel	0.09
Pantak	35	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	1.00
						Gravel	1.00
						Slope	1.00
LRE:							
Lark	95	Not limited		Not limited		Very limited	
						Droughty	1.00
						Slope	0.63
						Too sandy	0.50
MAB:							
McAllister	85	Not limited		Not limited		Not limited	
MCB:							
Michigan	90	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
MHA:							
Monahans	85	Very limited		Very limited		Not limited	
		Too sandy	1.00	Too sandy	1.00		
OCB:							
Ojinaga	57	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to cemented pan	1.00
						Droughty	1.00
						Gravel	0.43
Corazones	28	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.01	Too sandy	0.01	Gravel	1.00
						Droughty	0.99
OCF:							
Ojinaga	55	Not limited		Not limited		Very limited	
						Depth to cemented pan	1.00
						Droughty	1.00
						Gravel	1.00
Corazones	36	Very limited		Very limited		Very limited	
		Gravel	1.00	Gravel	1.00	Slope	1.00
		Slope	1.00			Gravel	1.00
						Droughty	0.92

Table 10.--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
PAG:							
Pantak	74	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.78	Slope	1.00
						Droughty	1.00
						Depth to bedrock	1.00
						Gravel	1.00
Rock outcrop	19	Not rated		Not rated		Not rated	
PRA:							
Pantera	63	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.77	Too sandy	0.77	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Droughty	1.00
						Too sandy	0.50
Riverwash	22	Not rated		Not rated		Not rated	
RLA:							
Reyab, moist	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
RSA:							
Reyab	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
RXG:							
Rock outcrop	75	Not rated		Not rated		Not rated	
Lampshire	20	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Slope	0.04	Droughty	1.00
						Depth to bedrock	1.00
						Gravel	1.00
						Slope	1.00
						Large stones	0.01
STB:							
Stovall	90	Not limited		Not limited		Not limited	
TEC:							
Tenneco, moist	85	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
VDA:							
Verhalen	65	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
Dalby	25	Not limited		Not limited		Not limited	
WAB:							
Walkerwells	80	Not limited		Not limited		Somewhat limited	
						Flooding	0.60

Table 10.--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
YAG:							
Yarbam	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Droughty	1.00
						Depth to bedrock	1.00
						Gravel	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
YLA:							
Yesum	50	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Loki	27	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Corvus	16	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to cemented pan	1.00
						Droughty	1.00
						Sodium content	1.00

Table 11.--Desertic Herbaceous Plants, Desertic Shrubs and Trees, and Burrowing Mammals for Food and Cover for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants		Burrowing Mammals and Reptiles		Desertic Shrubs and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AAD:							
Aguena	90	Not limited		Not limited		Somewhat limited Sandy surface	 0.60
ABE:							
Allamore	57	Not limited		Very limited Content of large stones 10-20" to Bedrock (Hard or Soft)	 1.00 0.01	Not limited	
Beach	23	Somewhat limited Droughty Too gravelly, cobbly, or stony	 0.50 0.09	Very limited Content of large stones < 10" to Bedrock (Hard or Soft)	 1.00 1.00	Somewhat limited Droughty Too gravelly, cobbly, or stony	 0.50 0.09
Rock outcrop	17	Not rated		Not rated		Not rated	
ABG:							
Allamore, moist	40	Somewhat limited Droughty Too gravelly, cobbly, or stony	 0.50 0.02	Very limited Content of large stones 10-20” to Bedrock (Hard or Soft)	 1.00 0.01	Somewhat limited Droughty Too gravelly, cobbly, or stony	 0.50 0.02
Beach, moist	40	Somewhat limited Droughty Too gravelly, cobbly, or stony	 0.50 0.01	Very limited < 10" to Bedrock (Hard or Soft) Content of large stones	 1.00 0.56	Somewhat limited Droughty Too gravelly, cobbly, or stony	 0.50 0.01
Rock outcrop	15	Not rated		Not rated		Not rated	
ANB:							
Antbed	85	Not limited		Very limited Too clayey	 1.00	Not limited	
BBC:							
Beach	85	Somewhat limited Droughty	 0.50	Very limited < 10" to Bedrock (Hard or Soft) Content of large stones	 1.00 1.00	Somewhat limited Droughty	 0.50
BBD:							
Beach	80	Somewhat limited Droughty	 0.50	Very limited < 10" to Bedrock (Hard or Soft)	 1.00	Somewhat limited Droughty	 0.50

Table 11.--Desertic Herbaceous Plants, Desertic Shrubs and Trees, and Burrowing Mammals for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Burrowing Mammals and Reptiles: Rating class and limiting features	Value	Desertic Shrubs and Trees: Rating class and limiting features	Value
BCE:							
Beach, moist--------	45	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.01	Content of large stones	0.86	Too gravelly, cobbly, or stony	0.01
Allamore, moist-----	40	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.02	Content of large stones	0.08	Too gravelly, cobbly, or stony	0.02
BCG:							
Beach----------	35	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Content of large stones	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.10	< 10" to Bedrock (Hard or Soft)	1.00	Too gravelly, cobbly, or stony	0.10
Allamore----------	22	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.97	Droughty	0.50
				Too gravelly	0.90		
Rock outcrop--------	19	Not rated		Not rated		Not rated	
BED:							
Beach, moist--------	65	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.01	Too gravelly	0.01	Too gravelly, cobbly, or stony	0.01
Tenneco, moist------	25	Not limited		Not limited		Not limited	
BHE:							
Bissett----------	66	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.74	Droughty	0.50
		Too gravelly, cobbly, or stony	0.01	Too gravelly	0.08	Too gravelly, cobbly, or stony	0.01
Beach----------	22	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.97	Droughty	0.50

Table 11.--Desertic Herbaceous Plants, Desertic Shrubs and Trees, and Burrowing Mammals for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Burrowing Mammals and Reptiles: Rating class and limiting features	Value	Desertic Shrubs and Trees: Rating class and limiting features	Value
BID:							
Bissett----------	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.74	Droughty	0.50
		Too gravelly, cobbly, or stony	0.08	Too gravelly	0.08	Too gravelly, cobbly, or stony	0.08
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIE:							
Bissett----------	65	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.29	Content of large stones	1.00	Too gravelly, cobbly, or stony	0.29
Rock outcrop--------	30	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	65	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Content of large stones	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.18	Too gravelly	0.68	Too gravelly, cobbly, or stony	0.18
				10-20" to Bedrock (Hard or Soft)	0.61		
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BRE:							
Bissett, moist------	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.95	Droughty	0.50
		Too gravelly, cobbly, or stony	0.17	Content of large stones	0.22	Too gravelly, cobbly, or stony	0.17
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BRG:							
Bissett, moist------	75	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Content of large stones	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.07	10-20" to Bedrock (Hard or Soft)	0.68	Too gravelly, cobbly, or stony	0.07
Rock outcrop--------	20	Not rated		Not rated		Not rated	

Table 11.--Desertic Herbaceous Plants, Desertic Shrubs and Trees, and Burrowing Mammals for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Burrowing Mammals and Reptiles: Rating class and limiting features	Value	Desertic Shrubs and Trees: Rating class and limiting features	Value
BSG:							
Bissett	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.12	Droughty	0.50
		Too gravelly, cobbly, or stony	0.02	Too gravelly	0.03	Too gravelly, cobbly, or stony	0.02
Rock outcrop	27	Not rated		Not rated		Not rated	
Beach	16	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.01			Too gravelly, cobbly, or stony	0.01
BVC:							
Bofecillos	60	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.08	Too gravelly	0.32	Too gravelly, cobbly, or stony	0.08
Leyva	25	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Too clayey	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.16	10-20" to Bedrock (Hard or Soft)	0.92	Too gravelly, cobbly, or stony	0.16
				Too gravelly	0.55		
				Content of large stones	0.04		
BVE:							
Bofecillos	37	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.04	Too gravelly	0.16	Too gravelly, cobbly, or stony	0.04
Leyva	33	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Content of large stones	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.07	Too clayey	0.89	Too gravelly, cobbly, or stony	0.07
				Too gravelly	0.74		
				10-20" to Bedrock (Hard or Soft)	0.39		
Horsetrap	17	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Content of large stones	0.78	Droughty	0.50
				10-20" to Bedrock (Hard or Soft)	0.61		

Table 11.--Desertic Herbaceous Plants, Desertic Shrubs and Trees, and Burrowing Mammals for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Burrowing Mammals and Reptiles: Rating class and limiting features	Value	Desertic Shrubs and Trees: Rating class and limiting features	Value
CCE:							
Changas	41	Somewhat limited		Very limited		Somewhat limited	
		Extreme soil temperatures	0.50	Too clayey	1.00	Extreme soil temperatures	0.50
		Excess salt	0.06			Excess salt	0.06
		Excess Sodium	0.03			Excess Sodium	0.03
Corazones	17	Somewhat limited		Somewhat limited		Somewhat limited	
		Extreme soil temperatures	0.50	Content of large stones	0.86	Extreme soil temperatures	0.50
		Too gravelly, cobbly, or stony	0.21	Too gravelly	0.61	Too gravelly, cobbly, or stony	0.21
CHC:							
Chilicotal	83	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.04	Content of large stones	0.56	Too gravelly, cobbly, or stony	0.04
				Too gravelly	0.08		
CIB:							
Chillon	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.84	Content of large stones	0.96	Too gravelly, cobbly, or stony	0.84
		Droughty	0.50	Too gravelly	0.37	Droughty	0.50
		Extreme soil temperatures	0.50			Extreme soil temperatures	0.50
CLA:							
Chipotle	63	Somewhat limited		Very limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.55	Flooding	1.00	Sandy surface	0.60
		Droughty	0.50	Too gravelly	1.00	Too gravelly, cobbly, or stony	0.55
						Droughty	0.50
Riverwash	22	Not rated		Not rated		Not rated	
COC:							
Chispa	55	Not limited		Not limited		Not limited	
Chilicotal	35	Somewhat limited		Very limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.18	Too gravelly	1.00	Too gravelly, cobbly, or stony	0.18
CPC:							
Chispa	55	Not limited		Somewhat limited		Not limited	
				Too clayey	0.11		
Tenneco	35	Not limited		Not limited		Not limited	
CTC:							
Corvus	35	Somewhat limited		Very limited		Somewhat limited	
		Excess salt	0.50	Cemented pan	1.00	Excess salt	0.50
		Droughty	0.50			Droughty	0.50

Table 11.--Desertic Herbaceous Plants, Desertic Shrubs and Trees, and Burrowing Mammals for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Burrowing Mammals and Reptiles: Rating class and limiting features	Value	Desertic Shrubs and Trees: Rating class and limiting features	Value
Yesum	25	Not limited		Not limited		Not limited	
Peligro	25	Somewhat limited		Not limited		Not limited	
		Droughty	0.50				
CVC:							
Culberspeth	65	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Cemented pan	1.00	Droughty	0.50
Chilicotal	30	Not limited		Somewhat limited		Not limited	
				Content of large stones	0.96		
				Too gravelly	0.05		
CWC:							
Culberspeth, moist	60	Not limited		Somewhat limited		Not limited	
				Cemented pan	0.01		
Kahn, moist	35	Not limited		Not limited		Not limited	
DEB:							
Dellahunt	80	Not limited		Very limited		Not limited	
				Flooding	1.00		
				Too clayey	0.19		
DNB:							
Dellahunt	30	Not limited		Not limited		Not limited	
Neimahr	25	Not limited		Somewhat limited		Not limited	
				10-20" to Bedrock (Hard or Soft)	0.21		
				Too clayey	0.11		
Joberanch	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	Cemented pan	0.92	Droughty	0.50
				Too clayey	0.01		
DOC:							
Double	90	Not limited		Not limited		Not limited	
ELC:							
Elcor	95	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
ELE:							
Elcor	80	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
EPA:							
Elcor	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.01	Droughty	0.50

Table 11.--Desertic Herbaceous Plants, Desertic Shrubs and Trees, and Burrowing Mammals for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Burrowing Mammals and Reptiles: Rating class and limiting features	Value	Desertic Shrubs and Trees: Rating class and limiting features	Value
Dellahunt	30	Not limited		Not limited		Not limited	
Pokorny	25	Not limited		Somewhat limited		Not limited	
				Cemented pan	0.21		
EPE:							
Elcor	30	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
Pokorny	30	Not limited		Somewhat limited		Not limited	
				Cemented pan	0.61		
				Too clayey	0.03		
Walkerwells	15	Not limited		Very limited			
				Flooding	1.00	Not limited	
				Too clayey	0.11		
Hollomex	15	Not limited		Not limited		Not limited	
GAA:							
Gypsic Aquisalids	95	Very limited		Very limited		Very limited	
		Excess salt	1.00	Flooding	1.00	Excess salt	1.00
		Excess Sodium	1.00	Too clayey	0.11	Excess Sodium	1.00
						Depth to saturated zone	0.99
HPC:							
Hollebeke	45	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Cemented pan	1.00	Droughty	0.50
				10-20" to Bedrock (Hard or Soft)	0.84		
Pokorny	35	Not limited		Somewhat limited		Not limited	
				Too clayey	0.03		
				Cemented pan	0.01		
HRC:							
Horsetrap	39	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.21	Droughty	0.50
				Too gravelly	0.08		
Bofecillos	39	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.04	Too gravelly	0.16	Too gravelly, cobbly, or stony	0.04
KPB:							
Kinco	43	Not limited		Not limited		Somewhat limited	
						Sandy surface	0.60

Table 11.--Desertic Herbaceous Plants, Desertic Shrubs and Trees, and Burrowing Mammals for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Burrowing Mammals and Reptiles: Rating class and limiting features	Value	Desertic Shrubs and Trees: Rating class and limiting features	Value
Aguena	27	Not limited		Not limited		Not limited	
						Sandy surface	0.60
Perilla	17	Not limited		Not limited		Not limited	
LPG:							
Lampshire	50	Somewhat limited		Very limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.58	< 10" to Bedrock (Hard or Soft)	1.00	Too gravelly, cobbly, or stony	0.58
		Droughty	0.50	Content of large stones	1.00	Droughty	0.50
Pantak	35	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.12	Too gravelly	1.00	Too gravelly, cobbly, or stony	0.12
				Too clayey	0.11		
LRE:							
Lark	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Sandy surface	0.50	Too Sandy	0.50	Droughty	0.50
		Droughty	0.50			Depth to saturated zone	0.44
						Sandy surface	0.40
MAB:							
McAllister	85	Not limited		Not limited		Not limited	
MCB:							
Michigan	90	Somewhat limited		Very limited		Somewhat limited	
		Too clayey	0.50	Too clayey	1.00	Too clayey	0.50
MHA:							
Monahans	85	Not limited		Not limited		Somewhat limited	
						Sandy surface	0.40
OCB:							
Ojinaga	57	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Cemented pan	1.00	Droughty	0.50
		Extreme soil temperatures	0.50	Too gravelly	0.79	Extreme soil temperatures	0.50
Corazones	28	Somewhat limited		Somewhat limited		Somewhat limited	
		Extreme soil temperatures	0.50	Too gravelly	0.93	Extreme soil temperatures	0.50
		Too gravelly, cobbly, or stony	0.02	Content of large stones	0.01	Too gravelly, cobbly, or stony	0.02
OCF:							
Ojinaga	55	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Too gravelly	0.99	Droughty	0.50
		Extreme soil temperatures	0.50	Cemented pan	0.97	Extreme soil temperatures	0.50
		Too gravelly, cobbly, or stony	0.01			Too gravelly, cobbly, or stony	0.01

Table 11.--Desertic Herbaceous Plants, Desertic Shrubs and Trees, and Burrowing Mammals for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants		Burrowing Mammals and Reptiles		Desertic Shrubs and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Corazones	36	Somewhat limited		Very limited		Somewhat limited	
		Too gravelly, cobbly, or stony	0.50	Too gravelly	1.00	Too gravelly, cobbly, or stony	0.50
		Extreme soil temperatures	0.50			Extreme soil temperatures	0.50
PAG:							
Pantak	74	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Content of large stones	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.01	< 10" to Bedrock (Hard or Soft)	1.00	Too gravelly, cobbly, or stony	0.01
				Too clayey	0.30		
				Too gravelly	0.01		
Rock outcrop	19	Not rated		Not rated		Not rated	
PRA:							
Pantera	63	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	Flooding	1.00	Sandy surface	0.60
		Extreme soil temperatures	0.50	Too gravelly	0.43	Droughty	0.50
						Extreme soil temperatures	0.50
Riverwash	22	Not rated		Not rated		Not rated	
RLA:							
Reyab, moist	85	Not limited		Very limited		Not limited	
				Flooding	1.00		
				Too clayey	0.01		
RSA:							
Reyab	90	Not limited		Very limited		Not limited	
				Flooding	1.00		
				Too clayey	0.19		
RXG:							
Rock outcrop	75	Not rated		Not rated		Not rated	
Lampshire	20	Somewhat limited		Very limited		Somewhat limited	
		Droughty	0.50	< 10" to Bedrock (Hard or Soft)	1.00	Droughty	0.50
		Too gravelly, cobbly, or stony	0.07	Too gravelly	0.04	Too gravelly, cobbly, or stony	0.07
STB:							
Stovall	90	Not limited		Not limited		Not limited	
TEC:							
Tenneco, moist	85	Not limited		Not limited		Not limited	
VDA:							
Verhalen	65	Somewhat limited		Very limited		Somewhat limited	
		Too clayey	0.50	Too clayey	1.00	Too clayey	0.50
				Flooding	0.50		

Table 11.--Desertic Herbaceous Plants, Desertic Shrubs and Trees, and Burrowing Mammals for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Desertic Herbaceous Plants: Rating class and limiting features	Value	Burrowing Mammals and Reptiles: Rating class and limiting features	Value	Desertic Shrubs and Trees: Rating class and limiting features	Value
Dalby	25	Not limited		Very limited		Not limited	
				Too clayey	1.00		
				Flooding	0.50		
WAB:							
Walkerwells	80	Not limited		Very limited		Not limited	
				Flooding	1.00		
				Too clayey	0.40		
YAG:							
Yarbam	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.50	10-20" to Bedrock (Hard or Soft)	0.54	Droughty	0.50
						Too gravelly, cobbly, or stony	0.04
		Too gravelly, cobbly, or stony	0.04	Content of large stones	0.08		
				Too gravelly	0.02		
Rock outcrop	30	Not rated		Not rated		Not rated	
YLA:							
Yesum	50	Not limited		Not limited		Not limited	
Loki	27	Not limited		Not limited		Not limited	
Corvus	16	Somewhat limited		Very limited		Somewhat limited	
		Excess salt	0.50	Cemented pan	0.99	Excess salt	0.50
		Droughty	0.50			Droughty	0.50

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants		Riparian Shrubs, Vines, and Trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AAD:					
Aguena	90	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.08
		Too sandy	0.50		
ABE:					
Allamore	57	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.99
Beach	23	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.36		
Rock outcrop	17	Not rated		Not rated	
ABG:					
Allamore, moist	40	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00
		Too gravelly, cobbly, or stony	0.08		
Beach, moist	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	0.01		
Rock outcrop	15	Not rated		Not rated	
ANB:					
Antbed	85	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants: Rating class and limiting features	Value	Riparian Shrubs, Vines, and Trees: Rating class and limiting features	Value
BBC:					
Beach	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	0.01		
BBD:					
Beach	80	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
BCE:					
Beach, moist	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	0.01		
Allamore, moist	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	0.07		
BCG:					
Beach	35	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		cobbly, or stony			
Allamore	22	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Rock outcrop	19	Not rated		Not rated	
BED:					
Beach, moist	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	0.01		
Tenneco, moist	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants: Rating class and limiting features	Value	Riparian Shrubs, Vines, and Trees: Rating class and limiting features	Value
BHE:					
Bissett	66	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		
Beach	22	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
BID:					
Bissett	65	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00
		Too gravelly, cobbly, or stony	0.32		
Rock outcrop	25	Not rated		Not rated	
BIE:					
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	0.88		
Rock outcrop	30	Not rated		Not rated	
BIG:					
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	0.68		
Rock outcrop	25	Not rated		Not rated	
BRE:					
Bissett, moist	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	0.64		
Rock outcrop	20	Not rated		Not rated	

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants: Rating class and limiting features	Value	Riparian Shrubs, Vines, and Trees: Rating class and limiting features	Value
BRG:					
Bissett, moist------	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	0.29		
Rock outcrop--------	20	Not rated		Not rated	
BSG:					
Bissett----------	40	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00
		Too gravelly, cobbly, or stony	0.08		
Rock outcrop--------	27	Not rated		Not rated	
Beach----------	16	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		
BVC:					
Bofecillos----------	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	0.32		
Leyva----------	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	0.61		
BVE:					
Bofecillos----------	37	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		

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants: Rating class and limiting features	Value	Riparian Shrubs, Vines, and Trees: Rating class and limiting features	Value
Leyva	33	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	0.27		
Horsetrap	17	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
CCE:					
Changas	41	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Corazones	17	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.66
		Too gravelly, cobbly, or stony	0.74		
CHC:					
Chilicotal	83	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.17
		Too gravelly, cobbly, or stony	0.15		
CIB:					
Chillon	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	1.00		
CLA:					
Chipotle	63	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Too gravelly, cobbly, or stony	1.00	Droughty	1.00
		Too sandy	0.50		
Riverwash	22	Not rated		Not rated	
COC:					
Chispa	55	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants: Rating class and limiting features	Value	Riparian Shrubs, Vines, and Trees: Rating class and limiting features	Value
Chilicotal----------	35	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.12
		Too gravelly, cobbly, or stony	0.68		
CPC:					
Chispa----------	55	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Tenneco----------	35	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
CTC:					
Corvus----------	35	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Yesum----------	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Peligro----------	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00
CVC:					
Culberspeth---------	65	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Chilicotal----------	30	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
CWC:					
Culberspeth, moist--	60	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.37
Kahn, moist---------	35	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants: Rating class and limiting features	Value	Riparian Shrubs, Vines, and Trees: Rating class and limiting features	Value
DEB:					
Dellahunt	80	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
DNB:					
Dellahunt	30	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Neimahr	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.63
Joberanch	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	1.00
DOC:					
Double	90	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
ELC:					
Elcor	95	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
ELE:					
Elcor	80	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
EPA:					
Elcor	35	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Dellahunt	30	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Pokorny	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.76

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants: Rating class and limiting features	Value	Riparian Shrubs, Vines, and Trees: Rating class and limiting features	Value
EPE:					
Elcor	30	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Pokorny	30	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.95
Walkerwells	15	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Hollomex	15	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.07
GAA:					
Gypsic Aquisalids	95	Very limited		Very limited	
		Too dry	1.00	Excess salt	1.00
		Infrequent flooding	1.00	Excess sodium	1.00
		Excess salt	1.00	Too dry	0.01
		Excess sodium	1.00		
HPC:					
Hollebeke	45	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Pokorny	35	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.43
HRC:					
Horsetrap	39	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Bofecillos	39	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		

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants: Rating class and limiting features	Value	Riparian Shrubs, Vines, and Trees: Rating class and limiting features	Value
KPB:					
Kinco	43	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
		Too sandy	0.50		
Aguena	27	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.08
		Too sandy	0.50		
Perilla	17	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
LPG:					
Lampshire	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	1.00		
Pantak	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	0.46		
LRE:					
Lark	95	Very limited		Very limited	
		Too sandy	1.00	Droughty	1.00
		Too dry	1.00	Too dry	0.56
		Infrequent flooding	1.00	Excess salt	0.01
		Excess salt	0.01		
MAB:					
McAllister	85	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
MCB:					
Michigan	90	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants: Rating class and limiting features	Value	Riparian Shrubs, Vines, and Trees: Rating class and limiting features	Value
MHA:					
Monahans	85	Very limited		Very limited	
		Too sandy	1.00	Too dry	1.00
		Too dry	1.00		
		Infrequent flooding	1.00		
OCB:					
Ojinaga	57	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00
Corazones	28	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00	Droughty	0.99
		Too gravelly, cobbly, or stony	0.08		
OCF:					
Ojinaga	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	0.05		
Corazones	36	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		
PAG:					
Pantak	74	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		
Rock outcrop	19	Not rated		Not rated	
PRA:					
Pantera	63	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Too sandy	0.50	Too dry	1.00
Riverwash	22	Not rated		Not rated	

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Riparian Herbaceous Plants: Rating class and limiting features	Value	Riparian Shrubs, Vines, and Trees: Rating class and limiting features	Value
RLA:					
Reyab, moist	85	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
RSA:					
Reyab	90	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
RXG:					
Rock outcrop	75	Not rated		Not rated	
Lampshire	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	0.29		
STB:					
Stovall	90	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
TEC:					
Tenneco, moist	85	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
VDA:					
Verhalen	65	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Dalby	25	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
WAB:					
Walkerwells	80	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		

Table 12.--Riparian Herbaceous Plants, Riparian Shrubs, Vines, and Trees for Food and Cover for Wildlife Habitat--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
YAG:					
Yarbam	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	0.17		
Rock outcrop	30	Not rated		Not rated	
YLA:					
Yesum	50	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Loki	27	Very limited		Very limited	
		Too dry	1.00	Too dry	1.00
		Infrequent flooding	1.00		
Corvus	16	Very limited		Very limited	
		Too dry	1.00	Droughty	1.00
		Infrequent flooding	1.00	Too dry	1.00

Table 13.--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 W/O 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
AAD:							
Aguena	90	Not limited		Not limited		Not limited	
ABE:							
Allamore	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	Slope	1.00	Slope	1.00
Beach	23	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	0.80	Large stones	0.80	Large stones	0.80
Rock outcrop	17	Not rated		Not rated		Not rated	
ABG:							
Allamore, moist	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
Beach, moist	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
Rock outcrop	15	Not rated		Not rated		Not rated	
ANB:							
Antbed	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
BBC:							
Beach	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
BBD:							
Beach	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	0.37	Slope	0.37	Slope	1.00
BCE:							
Beach, moist	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

Table 13.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings W/O 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
Allamore, moist	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
BCG:							
Beach	35	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	0.39	Large stones	0.39	Large stones	0.39
Allamore	22	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	19	Not rated		Not rated		Not rated	
BED:							
Beach, moist	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
Tenneco, moist	25	Not limited		Not limited		Very limited	
						Slope	1.00
BHE:							
Bissett	66	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
Beach	22	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
BID:							
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
		Slope	0.04	Slope	0.04	Slope	1.00
Rock outcrop	25	Not rated		Not rated		Not rated	

Table 13.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings W/O 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
BIE:							
Bissett----------	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
		Large stones	0.12	Large stones	0.12	Large stones	0.12
Rock outcrop--------	30	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	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
		Large stones	0.16	Large stones	0.16	Large stones	0.16
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BRE:							
Bissett, moist------	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	0.16	Slope	0.16	Slope	1.00
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BRG:							
Bissett, moist------	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	0.73	Large stones	0.73	Large stones	0.73
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BSG:							
Bissett----------	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
Rock outcrop--------	27	Not rated		Not rated		Not rated	
Beach----------	16	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
BVC:							
Bofecillos----------	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	0.13

Table 13.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings W/O 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
Leyva	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
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.13
BVE:							
Bofecillos	37	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
Leyva	33	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
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Horsetrap	17	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
CCE:							
Changas	41	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
				Subsidence risk severe	0.75		
Corazones	17	Not limited		Not limited		Not limited	
CHC:							
Chilicotal	83	Not limited		Not limited		Not limited	
CIB:							
Chillon	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Large stones	0.01	Large stones	0.01	Large stones	0.01
CLA:							
Chipotle	63	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Riverwash	22	Not rated		Not rated		Not rated	
COC:							
Chispa	55	Not limited		Not limited		Not limited	
Chilicotal	35	Not limited		Not limited		Somewhat limited	
						Slope	0.13

Table 13.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings W/O 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
CPC:							
Chispa	55	Not limited		Not limited		Not limited	
Tenneco	35	Not limited		Not limited		Somewhat limited	
						Slope	0.13
CTC:							
Corvus	35	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
				Subsidence risk severe	1.00		
Yesum	25	Not limited		Very limited		Somewhat limited	
				Subsidence risk severe	1.00	Slope	0.13
Peligro	25	Not limited		Very limited		Somewhat limited	
				Subsidence risk severe	1.00	Slope	0.13
CVC:							
Culberspeth	65	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
						Slope	0.13
Chilicotal	30	Not limited		Not limited		Somewhat limited	
						Slope	0.13
CWC:							
Culberspeth, moist	60	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
						Slope	0.13
Kahn, moist	35	Not limited		Not limited		Somewhat limited	
						Slope	0.13
DEB:							
Dellahunt	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Subsidence risk	0.01		
DNB:							
Dellahunt	30	Not limited		Somewhat limited		Not limited	
				Subsidence risk	0.03		
Neimahr	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

Table 13.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings W/O 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
Joberanch	25	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
				Subsidence risk severe	1.00		
DOC:							
Double	90	Not limited		Not limited		Somewhat limited	
						Slope	0.13
ELC:							
Elcor	95	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
				Subsidence risk	0.10	Slope	0.13
ELE:							
Elcor	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
				Subsidence risk	0.29		
EPA:							
Elcor	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
				Subsidence risk severe	1.00		
Dellahunt	30	Not limited		Somewhat limited		Not limited	
				Subsidence risk	0.01		
Pokorny	25	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
				Subsidence risk severe	1.00		
EPE:							
Elcor	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	1.00	Slope	1.00	Slope	1.00
				Subsidence risk	0.15		

Table 13.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings W/O 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
Pokorny	30	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
				Subsidence risk severe	1.00		
Walkerwells	15	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Subsidence risk severe	1.00	Shrink-swell	0.50
				Shrink-swell	0.50		
Hollomex	15	Not limited		Very limited		Somewhat limited	
				Subsidence risk severe	1.00	Slope	0.13
GAA:							
Gypsic Aquisalids	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Subsidence risk severe	1.00		
				Depth to saturated zone	0.95		
HPC:							
Hollebeke	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
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
				Subsidence risk	0.01	Slope	0.13
Pokorny	35	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
				Subsidence risk severe	1.00	Slope	0.13
HRC:							
Horsetrap	39	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Bofecillos	39	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

Table 13.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings W/O 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
KPB:							
Kinco	43	Not limited		Not limited		Not limited	
Aguena	27	Not limited		Not limited		Not limited	
Perilla	17	Not limited		Not limited		Not limited	
LPG:							
Lampshire	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	Depth to hard bedrock	1.00
		Large stones	0.97	Large stones	0.97	Large stones	0.97
Pantak	35	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
		Shrink-swell	0.50			Shrink-swell	0.50
LRE:							
Lark	95	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Subsidence risk severe	1.00	Slope	1.00
				Slope	0.63		
				Depth to saturated zone	0.61		
MAB:							
McAllister	85	Not limited		Not limited		Not limited	
MCB:							
Michigan	90	Very limited		Very limited		Very limited	
		Shrink-swell	0.99	Shrink-swell	0.99	Shrink-swell	0.99
MHA:							
Monahans	85	Not limited		Very limited		Not limited	
				Subsidence risk severe	1.00		
OCB:							
Ojinaga	57	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
Corazones	28	Not limited		Not limited		Not limited	
OCF:							
Ojinaga	55	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00

Table 13.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings W/O 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
Corazones	36	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
PAG:							
Pantak	74	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
		Shrink-swell	0.50			Shrink-swell	0.50
Rock outcrop	19	Not rated		Not rated		Not rated	
PRA:							
Pantera	63	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Riverwash	22	Not rated		Not rated		Not rated	
RLA:							
Reyab, moist	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.07	Shrink-swell	0.50
RSA:							
Reyab	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.01			Shrink-swell	0.01
RXG:							
Rock outcrop	75	Not rated		Not rated		Not rated	
Lampshire	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
STB:							
Stovall	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
TEC:							
Tenneco, moist	85	Not limited		Not limited		Somewhat limited	
						Slope	0.13
VDA:							
Verhalen	65	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	0.03		
Dalby	25	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		

Table 13.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings W/O 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
WAB:							
Walkerwells---------	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Subsidence risk severe	0.95	Shrink-swell	0.50
				Shrink-swell	0.50		
YAG:							
Yarbam----------	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	
YLA:							
Yesum----------	50	Not limited		Very limited		Not limited	
				Subsidence risk severe	1.00		
Loki----------	27	Not limited		Very limited		Not limited	
				Subsidence risk severe	1.00		
Corvus----------	16	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
				Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
				Subsidence risk severe	1.00		

Table 14.--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
AAD:							
Aguena	90	Not limited		Very limited		Somewhat limited	
				Unstable excavation walls	1.00	Droughty	0.09
ABE:							
Allamore	57	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
				Unstable excavation walls	0.10	Droughty	0.99
						Gravel	0.34
						Large stones	0.26
Beach	23	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	Large stones	1.00
		Large stones	0.80	Large stones	0.80	Droughty	1.00
				Unstable excavation walls	0.50	Slope	1.00
Rock outcrop	17	Not rated		Not rated		Not rated	
ABG:							
Allamore, moist	40	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
				Unstable excavation walls	0.10	Droughty	1.00
						Gravel	0.99
						Large stones	0.01
Beach, moist	40	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
				Unstable excavation walls	0.50	Droughty	1.00
						Large stones	0.54
						Gravel	0.19
Rock outcrop	15	Not rated		Not rated		Not rated	
ANB:							
Antbed	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50	Too clayey	0.08		

Table 14.--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
BBC:							
Beach	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
				Unstable excavation walls	0.50	Droughty	1.00
						Large stones	0.92
						Gravel	0.01
BBD:							
Beach	80	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	Unstable excavation walls	0.50	Droughty	1.00
				Slope	0.37	Gravel	0.89
						Slope	0.37
						Large stones	0.01
BCE:							
Beach, moist	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
				Unstable excavation walls	0.50	Slope	1.00
						Large stones	0.74
						Gravel	0.08
Allamore, moist	40	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	0.50	Slope	1.00
						Gravel	0.78
						Large stones	0.20
BCG:							
Beach	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	1.00	Slope	1.00	Slope	1.00
		Large stones	0.39	Unstable excavation walls	0.50	Large stones	1.00
				Large stones	0.39	Droughty	1.00
Allamore	22	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
				Unstable excavation walls	0.10	Depth to bedrock	1.00
						Gravel	0.99
Rock outcrop	19	Not rated		Not rated		Not rated	

Table 14.--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
BED:							
Beach, moist--------	65	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
				Unstable excavation walls	0.10	Droughty	1.00
						Gravel	1.00
Tenneco, moist------	25	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
BHE:							
Bissett----------	66	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	0.10	Gravel	1.00
						Slope	1.00
						Carbonate content	1.00
Beach----------	22	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
				Unstable excavation walls	0.10	Slope	1.00
						Gravel	0.99
BID:							
Bissett----------	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	0.04	Unstable excavation walls	0.10	Droughty	1.00
				Slope	0.04	Carbonate content	1.00
						Gravel	0.68
						Large stones	0.68
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIE:							
Bissett----------	65	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	0.12	Unstable excavation walls	0.50	Slope	1.00
				Large stones	0.12	Large stones	1.00
						Carbonate content	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	

Table 14.--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
BIG:							
Bissett	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	Droughty	1.00
		Large stones	0.16	Large stones	0.16	Depth to bedrock	1.00
				Unstable excavation walls	0.10	Gravel	1.00
						Carbonate content	1.00
Rock outcrop	25	Not rated		Not rated		Not rated	
BRE:							
Bissett, moist	75	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	0.16	Slope	0.16	Droughty	1.00
				Unstable excavation walls	0.10	Carbonate content	1.00
						Gravel	0.93
						Large stones	0.61
Rock outcrop	20	Not rated		Not rated		Not rated	
BRG:							
Bissett, moist	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	0.73	Large stones	0.73	Depth to bedrock	1.00
				Unstable excavation walls	0.10	Large stones	1.00
						Carbonate content	1.00
Rock outcrop	20	Not rated		Not rated		Not rated	
BSG:							
Bissett	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	Depth to bedrock	1.00
				Unstable excavation walls	0.10	Droughty	1.00
						Gravel	1.00
						Carbonate content	1.00
Rock outcrop	27	Not rated		Not rated		Not rated	
Beach	16	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
				Unstable excavation walls	0.50	Droughty	1.00
						Gravel	0.99

Table 14.--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
BVC:							
Bofecillos----------	60	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
				Unstable excavation walls	0.50	Droughty	1.00
						Gravel	1.00
Leyva----------	25	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Shrink-swell	0.50	Unstable excavation walls	0.10	Droughty	1.00
						Gravel	1.00
						Large stones	0.16
BVE:							
Bofecillos----------	37	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
				Unstable excavation walls	0.50	Gravel	1.00
						Slope	1.00
Leyva----------	33	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Large stones	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
		Shrink-swell	0.50	Unstable excavation walls	0.10	Depth to bedrock	1.00
						Slope	1.00
Horsetrap----------	17	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
				Unstable excavation walls	0.10	Slope	1.00
						Large stones	0.68
						Gravel	0.01
CCE:							
Changas----------	41	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	0.41	Sodium content	1.00
		Slope	1.00	Unstable excavation walls	0.10		
Corazones----------	17	Not limited		Very limited		Very limited	
				Unstable excavation walls	1.00	Gravel	1.00
						Droughty	0.68
						Large stones	0.32
CHC:							
Chilicotal----------	83	Not limited		Very limited		Very limited	
				Unstable excavation walls	1.00	Gravel	1.00
						Droughty	0.18

Table 14.--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
CIB:							
Chillon	85	Somewhat limited		Very limited		Very limited	
		Large stones	0.01	Unstable excavation walls	1.00	Droughty	1.00
				Large stones	0.01	Gravel	1.00
						Large stones	0.92
CLA:							
Chipotle	63	Very limited		Very limited		Very limited	
		Flooding	1.00	Unstable excavation walls	1.00	Flooding	1.00
				Flooding	0.80	Droughty	1.00
						Gravel	1.00
Riverwash	22	Not rated		Not rated		Not rated	
COC:							
Chispa	55	Not limited		Very limited		Somewhat limited	
				Unstable excavation walls	1.00	Gravel	0.05
Chilicotal	35	Not limited		Very limited		Very limited	
				Unstable excavation walls	1.00	Gravel	1.00
						Droughty	0.14
CPC:							
Chispa	55	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
Tenneco	35	Not limited		Somewhat limited		Not limited	
				Unstable excavation walls	0.10		
CTC:							
Corvus	35	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Droughty	1.00
				Unstable excavation walls	0.50	Sodium content	1.00
Yesum	25	Not limited		Somewhat limited		Not limited	
				Unstable excavation walls	0.10		
Peligro	25	Not limited		Very limited		Very limited	
				Unstable excavation walls	1.00	Droughty	1.00

Table 14.--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
CVC:							
Culberspeth---------	65	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Droughty	1.00
				Unstable excavation walls	0.50	Gravel	0.32
Chilicotal----------	30	Not limited		Very limited		Not limited	
				Unstable excavation walls	1.00		
CWC:							
Culberspeth, moist--	60	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Droughty	0.39
				Unstable excavation walls	0.10		
Kahn, moist---------	35	Not limited		Somewhat limited		Not limited	
				Unstable excavation walls	0.10		
DEB:							
Dellahunt----------	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Unstable excavation walls	0.10		
DNB:							
Dellahunt----------	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
Neimahr----------	25	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Low strength	1.00	Unstable excavation walls	0.10	Droughty	0.65
Joberanch----------	25	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Droughty	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
DOC:							
Double----------	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		

Table 14.--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
ELC:							
Elcor	95	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
				Unstable excavation walls	0.50	Depth to bedrock	1.00
ELE:							
Elcor	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
		Low strength	1.00	Unstable excavation walls	0.50	Slope	1.00
EPA:							
Elcor	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
				Unstable excavation walls	0.10	Droughty	1.00
Dellahunt	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
Pokorny	25	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Droughty	0.77
		Low strength	1.00	Unstable excavation walls	0.10		
EPE:							
Elcor	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
		Low strength	0.78	Unstable excavation walls	0.50	Slope	1.00
Pokorny	30	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Droughty	0.96
		Low strength	1.00	Unstable excavation walls	0.10		
Walkerwells	15	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				

Table 14.--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
Hollomex	15	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Unstable excavation walls	0.10	Droughty	0.08
GAA:							
Gypsic Aquisalids	95	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Depth to saturated zone	0.95	Salinity	1.00
		Low strength	1.00	Flooding	0.60	Sodium content	1.00
				Unstable excavation walls	0.10	Flooding	0.60
HPC:							
Hollebeke	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
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Droughty	1.00
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to bedrock	1.00
				Unstable excavation walls	0.50		
Pokorny	35	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Droughty	0.45
		Low strength	1.00	Unstable excavation walls	0.10		
HRC:							
Horsetrap	39	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
				Unstable excavation walls	0.10	Depth to bedrock	1.00
Bofecillos	39	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
				Unstable excavation walls	0.50	Droughty	1.00
						Gravel	1.00
KPB:							
Kinco	43	Not limited		Very limited		Somewhat limited	
				Unstable excavation walls	1.00	Too sandy	0.50
Aguena	27	Not limited		Very limited		Somewhat limited	
				Unstable excavation walls	1.00	Droughty	0.09
Perilla	17	Not limited		Somewhat limited		Not limited	
				Unstable excavation walls	0.10		

Table 14.--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
LPG:							
Lampshire	50	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	0.97	Large stones	0.97	Large stones	1.00
				Unstable excavation walls	0.50	Slope	1.00
						Gravel	0.09
Pantak	35	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
		Shrink-swell	0.50	Unstable excavation walls	0.10	Gravel	1.00
						Slope	1.00
LRE:							
Lark	95	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Unstable excavation walls	1.00	Droughty	1.00
				Slope	0.63	Slope	0.63
				Depth to saturated zone	0.61	Too sandy	0.50
MAB:							
McAllister	85	Not limited		Somewhat limited		Not limited	
				Unstable excavation walls	0.10		
MCB:							
Michigan	90	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Unstable excavation walls	0.10	Too clayey	1.00
		Shrink-swell	0.99	Too clayey	0.05		
MHA:							
Monahans	85	Not limited		Somewhat limited		Not limited	
				Unstable excavation walls	0.10		
OCB:							
Ojinaga	57	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Droughty	1.00
				Unstable excavation walls	0.10	Gravel	0.43
Corazones	28	Not limited		Very limited		Very limited	
				Unstable excavation walls	1.00	Gravel	1.00
						Droughty	0.99

Table 14.--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
OCF:							
Ojinaga	55	Very limited		Very limited		Very limited	
		Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Droughty	1.00
				Unstable excavation walls	0.10	Gravel	1.00
Corazones	36	Very limited		Very limited		Very limited	
		Slope	1.00	Unstable excavation walls	1.00	Slope	1.00
				Slope	1.00	Gravel	1.00
						Droughty	0.92
PAG:							
Pantak	74	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
		Shrink-swell	0.50	Unstable excavation walls	0.50	Depth to bedrock	1.00
						Gravel	1.00
Rock outcrop	19	Not rated		Not rated		Not rated	
PRA:							
Pantera	63	Very limited		Very limited		Very limited	
		Flooding	1.00	Unstable excavation walls	1.00	Flooding	1.00
				Flooding	0.80	Droughty	1.00
						Too sandy	0.50
Riverwash	22	Not rated		Not rated		Not rated	
RLA:							
Reyab, moist	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
RSA:							
Reyab	90	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.01				

Table 14.--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
RXG:							
Rock outcrop--------	75	Not rated		Not rated		Not rated	
Lampshire----------	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
				Unstable excavation walls	0.50	Gravel	1.00
						Slope	1.00
						Large stones	0.01
STB:							
Stovall----------	90	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Unstable excavation walls	0.10		
TEC:							
Tenneco, moist------	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
VDA:							
Verhalen----------	65	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Unstable excavation walls	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.96		
		Flooding	0.40				
Dalby----------	25	Very limited		Very limited		Not limited	
		Shrink-swell	1.00	Unstable excavation walls	1.00		
		Low strength	1.00	Too clayey	0.98		
		Flooding	0.40				
WAB:							
Walkerwells---------	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	0.50	Unstable excavation walls	0.10		
YAG:							
Yarbam----------	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
				Unstable excavation walls	0.10	Depth to bedrock	1.00
						Gravel	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	

Table 14.--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
YLA:							
Yesum	50	Not limited		Somewhat limited Unstable excavation walls	0.10	Not limited	
Loki	27	Very limited Low strength	1.00	Somewhat limited Unstable excavation walls	0.10	Not limited	
Corvus	16	Very limited Depth to thick cemented pan Depth to thin cemented pan Low strength	1.00 1.00 1.00	Very limited Depth to thick cemented pan Depth to thin cemented pan Unstable excavation walls	1.00 1.00 0.10	Very limited Depth to cemented pan Droughty Sodium content	1.00 1.00 1.00

Table 15.--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
AAD:					
Aguena	90	Not limited		Very limited	
				Seepage	1.00
				Slope	0.08
ABE:					
Allamore	57	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	0.19
Beach	23	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Large stones	1.00
		Large stones	0.80	Slope	1.00
Rock outcrop	17	Not rated		Not rated	
ABG:					
Allamore, moist	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
Beach, moist	40	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	
ANB:					
Antbed	85	Very limited		Not limited	
		Slow water movement	1.00		
BBC:					
Beach	85	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.68
				Large stones	0.22

Table 15.--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
BBD:					
Beach	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.37	Slope	1.00
BCE:					
Beach, moist	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Large stones	0.01
Allamore, moist	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
BCG:					
Beach	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.39	Large stones	1.00
Allamore	22	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop	19	Not rated		Not rated	
BED:					
Beach, moist	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	1.00
Tenneco, moist	25	Somewhat limited		Very limited	
		Slow water movement	0.50	Slope	1.00
				Seepage	0.50
BHE:					
Bissett	66	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00
Beach	22	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00

Table 15.--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
BID:					
Bissett----------	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.04	Seepage	1.00
				Slope	1.00
Rock outcrop--------	25	Not rated		Not rated	
BIE:					
Bissett----------	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.12	Large stones	0.86
Rock outcrop--------	30	Not rated		Not rated	
BIG:					
Bissett----------	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.16	Seepage	1.00
				Large stones	0.92
Rock outcrop--------	25	Not rated		Not rated	
BRE:					
Bissett, moist------	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Slope	1.00
Rock outcrop--------	20	Not rated		Not rated	
BRG:					
Bissett, moist------	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.73	Seepage	1.00
				Large stones	1.00
Rock outcrop--------	20	Not rated		Not rated	
BSG:					
Bissett----------	40	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 15.—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--------	27	Not rated		Not rated	
Beach----------	16	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
BVC:					
Bofecillos----------	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.68
Leyva----------	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.68
BVE:					
Bofecillos----------	37	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Leyva----------	33	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Large stones	0.22
Horsetrap----------	17	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Large stones	0.06
CCE:					
Changas----------	41	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	1.00		
Corazones----------	17	Not limited		Very limited	
				Seepage	1.00
				Slope	0.08
CHC:					
Chilicotal----------	83	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.08
CIB:					
Chillon----------	85	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Large stones	0.01	Large stones	0.12

Table 15.--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
CLA:					
Chipotle	63	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
				Seepage	1.00
Riverwash	22	Not rated		Not rated	
COC:					
Chispa	55	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.08
Chilicotal	35	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
CPC:					
Chispa	55	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.08
Tenneco	35	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
CTC:					
Corvus	35	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	0.50
				Slope	0.08
Yesum	25	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
Peligro	25	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
CVC:					
Culberspeth	65	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Slope	0.68
Chilicotal	30	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
CWC:					
Culberspeth, moist	60	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Slope	0.68
				Seepage	0.50

Table 15.--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
Kahn, moist---------	35	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.68
DEB:					
Dellahunt----------	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Seepage	0.50
DNB:					
Dellahunt----------	30	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
Neimahr----------	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Seepage	0.50
Joberanch----------	25	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
DOC:					
Double----------	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
ELC:					
Elcor----------	95	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.68
ELE:					
Elcor----------	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
EPA:					
Elcor----------	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Seepage	0.50
Dellahunt----------	30	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.50
Pokorny----------	25	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	0.50

Table 15.--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
EPE:					
Elcor	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Pokorny	30	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	0.50
Walkerwells	15	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00		
Hollomex	15	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
GAA:					
Gypsic Aquisalids	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
HPC:					
Hollebeke	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	0.68
Pokorny	35	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Slope	0.68
				Seepage	0.50
HRC:					
Horsetrap	39	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.32
Bofecillos	39	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
				Slope	0.68

Table 15.--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
KPB:					
Kinco	43	Not limited		Very limited	
				Seepage	1.00
Aguena	27	Not limited		Very limited	
				Seepage	1.00
Perilla	17	Not limited		Very limited	
				Seepage	1.00
LPG:					
Lampshire	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Large stones	0.97	Large stones	1.00
Pantak	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
LRE:					
Lark	95	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Depth to saturated zone	0.99	Slope	1.00
		Slope	0.63	Depth to saturated zone	0.72
MAB:					
McAllister	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
MCB:					
Michigan	90	Very limited		Not limited	
		Slow water movement	1.00		
MHA:					
Monahans	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
OCB:					
Ojinaga	57	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
Corazones	28	Not limited		Very limited	
				Seepage	1.00

Table 15.--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
OCF:					
Ojinaga	55	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
Corazones	36	Very limited		Very limited	
		Slope	1.00	Seepage	1.00
				Slope	1.00
PAG:					
Pantak	74	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop	19	Not rated		Not rated	
PRA:					
Pantera	63	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
Riverwash	22	Not rated		Not rated	
RLA:					
Reyab, moist	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00		
RSA:					
Reyab	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00		
RXG:					
Rock outcrop	75	Not rated		Not rated	
Lampshire	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
STB:					
Stovall	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
TEC:					
Tenneco, moist	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50

Table 15.--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
VDA:					
Verhalen	65	Very limited		Somewhat limited	
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
Dalby	25	Very limited		Somewhat limited	
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
WAB:					
Walkerwells	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00		
YAG:					
Yarbam	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00
Rock outcrop	30	Not rated		Not rated	
YLA:					
Yesum	50	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
Loki	27	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
Corvus	16	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00

Table 16.--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
AAD:							
Aguena	90	Somewhat limited		Not limited		Somewhat limited	
		Too sandy	0.50			Seepage	0.50
						Too sandy	0.50
ABE:							
Allamore	57	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
						Gravel content	0.24
Beach	23	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
		Large stones	0.80			Large stones	0.80
Rock outcrop	17	Not rated		Not rated		Not rated	
ABG:							
Allamore, moist	40	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
						Gravel content	0.99
Beach, moist	40	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
						Gravel content	0.20
Rock outcrop	15	Not rated		Not rated		Not rated	
ANB:							
Antbed	85	Not limited		Not limited		Very limited	
						Hard to compact	1.00
BBC:							
Beach	85	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Gravel content	0.01
BBD:							
Beach	80	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.37	Depth to bedrock	1.00
		Slope	0.37			Gravel content	0.89
						Slope	0.37
BCE:							
Beach, moist	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
						Gravel content	0.08

Table 16.--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
Allamore, moist-----	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
						Gravel content	0.78
BCG:							
Beach----------	35	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
		Large stones	0.39			Large stones	0.39
Allamore----------	22	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
						Gravel content	1.00
Rock outcrop--------	19	Not rated		Not rated		Not rated	
BED:							
Beach, moist--------	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too sandy	1.00			Gravel content	1.00
						Too sandy	1.00
Tenneco, moist------	25	Not limited		Not limited		Not limited	
BHE:							
Bissett----------	66	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Gravel content	1.00
						Slope	1.00
						Carbonate content	1.00
						Seepage	0.50
Beach----------	22	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
						Gravel content	0.99
BID:							
Bissett----------	65	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.04	Depth to bedrock	1.00
		Slope	0.04			Carbonate content	1.00
						Gravel content	0.68
						Seepage	0.50
						Slope	0.04
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIE:							
Bissett----------	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
		Large stones	0.12			Carbonate content	1.00
						Gravel content	0.54
						Seepage	0.50

Table 16.--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--------	30	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	65	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
		Large stones	0.15			Carbonate content	1.00
						Seepage	0.50
						Gravel content	0.39
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BRE:							
Bissett, moist------	75	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.16	Depth to bedrock	1.00
		Slope	0.16			Carbonate content	1.00
						Gravel content	0.95
						Seepage	0.50
						Slope	0.16
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BRG:							
Bissett, moist------	75	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
		Large stones	0.73			Carbonate content	1.00
						Large stones	0.73
						Seepage	0.50
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BSG:							
Bissett----------	40	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
						Gravel content	1.00
						Carbonate content	1.00
						Seepage	0.50
Rock outcrop--------	27	Not rated		Not rated		Not rated	
Beach----------	16	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
						Gravel content	0.99
BVC:							
Bofecillos----------	60	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Gravel content	1.00
Leyva----------	25	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Gravel content	1.00

Table 16.--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
BVE:							
Bofecillos	37	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Gravel content	1.00
						Slope	1.00
Leyva	33	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
						Gravel content	0.43
Horsetrap	17	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
						Gravel content	0.01
CCE:							
Changas	41	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Hard to compact	1.00
						Slope	1.00
Corazones	17	Not limited		Not limited		Very limited	
						Gravel content	1.00
						Seepage	0.50
CHC:							
Chilicotal	83	Not limited		Not limited		Very limited	
						Gravel content	1.00
CIB:							
Chillon	85	Somewhat limited		Not limited		Very limited	
		Large stones	0.07			Seepage	1.00
						Gravel content	1.00
						Large stones	0.07
CLA:							
Chipotle	63	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Gravel content	1.00
		Too sandy	0.50			Seepage	0.50
						Too sandy	0.50
Riverwash	22	Not rated		Not rated		Not rated	
COC:							
Chispa	55	Not limited		Not limited		Somewhat limited	
						Gravel content	0.70
Chilicotal	35	Not limited		Not limited		Very limited	
						Gravel content	1.00
CPC:							
Chispa	55	Not limited		Not limited		Not limited	
Tenneco	35	Not limited		Not limited		Not limited	

Table 16.--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
CTC:							
Corvus	35	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
		Too sandy	1.00			Too sandy	1.00
Yesum	25	Not limited		Not limited		Not limited	
Peligro	25	Very limited		Not limited		Very limited	
		Too sandy	1.00			Too sandy	1.00
CVC:							
Culberspeth	65	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
						Gravel content	0.42
Chilicotal	30	Not limited		Not limited		Very limited	
						Gravel content	0.99
CWC:							
Culberspeth, moist	60	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
Kahn, moist	35	Not limited		Not limited		Not limited	
DEB:							
Dellahunt	80	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
DNB:							
Dellahunt	30	Not limited		Not limited		Not limited	
Neimahr	25	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
Joberanch	25	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
DOC:							
Double	90	Not limited		Not limited		Not limited	
ELC:							
Elcor	95	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
ELE:							
Elcor	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00

Table 16.--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
EPA:							
Elcor	35	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
Dellahunt	30	Not limited		Not limited		Not limited	
Pokorny	25	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
EPE:							
Elcor	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Pokorny	30	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
Walkerwells	15	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
Hollomex	15	Not limited		Not limited		Not limited	
GAA:							
Gypsic Aquisalids	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.09
		Excess salt	1.00	Depth to saturated zone	1.00		
		Depth to saturated zone	1.00				
HPC:							
Hollebeke	45	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
		Too sandy	1.00			Too sandy	1.00
Pokorny	35	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
HRC:							
Horsetrap	39	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Gravel content	0.60
Bofecillos	39	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
						Gravel content	1.00

Table 16.--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
KPB:							
Kinco	43	Somewhat limited		Not limited		Somewhat limited	
		Too sandy	0.50			Seepage	0.50
						Too sandy	0.50
Aguena	27	Somewhat limited		Not limited		Somewhat limited	
		Too sandy	0.50			Seepage	0.50
						Too sandy	0.50
Perilla	17	Not limited		Not limited		Somewhat limited	
						Seepage	0.50
LPG:							
Lampshire	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
		Large stones	0.97			Large stones	0.97
						Gravel content	0.09
Pantak	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Gravel content	1.00
		Too sandy	1.00			Slope	1.00
						Too sandy	1.00
LRE:							
Lark	95	Very limited		Very limited		Very limited	
		Too sandy	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Slope	0.63	Too sandy	1.00
		Slope	0.63			Slope	0.63
MAB:							
McAllister	85	Not limited		Not limited		Not limited	
MCB:							
Michigan	90	Not limited		Not limited		Very limited	
						Hard to compact	1.00
MHA:							
Monahans	85	Not limited		Not limited		Not limited	
OCB:							
Ojinaga	57	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
		Too sandy	1.00			Gravel content	1.00
						Too sandy	1.00
						Seepage	0.50
Corazones	28	Not limited		Not limited		Very limited	
						Gravel content	1.00
						Seepage	0.50

Table 16.--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
OCF:							
Ojinaga	55	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00
						Gravel content	1.00
						Seepage	0.50
Corazones	36	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
						Slope	1.00
						Seepage	0.50
PAG:							
Pantak	74	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
						Gravel content	0.92
						Seepage	0.50
Rock outcrop	19	Not rated		Not rated		Not rated	
PRA:							
Pantera	63	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
Riverwash	22	Not rated		Not rated		Not rated	
RLA:							
Reyab, moist	85	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
RSA:							
Reyab	90	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
RXG:							
Rock outcrop	75	Not rated		Not rated		Not rated	
Lampshire	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Gravel content	1.00
						Slope	1.00
STB:							
Stovall	90	Not limited		Not limited		Not limited	
TEC:							
Tenneco, moist	85	Not limited		Not limited		Not limited	

Table 16.--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
VDA:							
Verhalen	65	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Hard to compact	1.00
Dalby	25	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Hard to compact	1.00
WAB:							
Walkerwells	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Hard to compact	1.00
YAG:							
Yarbam	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
						Gravel content	0.91
						Seepage	0.50
Rock outcrop	30	Not rated		Not rated		Not rated	
YLA:							
Yesum	50	Not limited		Not limited		Not limited	
Loki	27	Not limited		Not limited		Not limited	
Corvus	16	Very limited		Not limited		Very limited	
		Depth to thick cemented pan	1.00			Depth to cemented pan	1.00

Table 17.--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
AAD:					
Aguena	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.02
ABE:					
Allamore	57	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Beach	23	Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
Rock outcrop	17	Not rated		Not rated	
ABG:					
Allamore, moist	40	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Beach, moist	40	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	
ANB:					
Antbed	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BBC:					
Beach	85	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.03
BBD:					
Beach	80	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.06

Table 17.--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
BCE:					
Beach, moist	45	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Allamore, moist	40	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
BCG:					
Beach	35	Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
Allamore	22	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.43	Thickest layer	0.00
Rock outcrop	19	Not rated		Not rated	
BED:					
Beach, moist	65	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Tenneco, moist	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BHE:					
Bissett	66	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.00
Beach	22	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
BID:					
Bissett	65	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	
BIE:					
Bissett	65	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.00
Rock outcrop	30	Not rated		Not rated	

Table 17.--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
BIG:					
Bissett	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop	25	Not rated		Not rated	
BRE:					
Bissett, moist	75	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.00
Rock outcrop	20	Not rated		Not rated	
BRG:					
Bissett, moist	75	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Rock outcrop	20	Not rated		Not rated	
BSG:					
Bissett	40	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Rock outcrop	27	Not rated		Not rated	
Beach	16	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
BVC:					
Bofecillos	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Leyva	25	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.45	Thickest layer	0.00
BVE:					
Bofecillos	37	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.13	Thickest layer	0.00
Leyva	33	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.33	Thickest layer	0.00
Horsetrap	17	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 17.--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
CCE:					
Changas	41	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Corazones	17	Fair		Poor	
		Thickest layer	0.28	Bottom layer	0.00
		Bottom layer	0.40	Thickest layer	0.00
CHC:					
Chilicotal	83	Fair		Poor	
		Thickest layer	0.08	Bottom layer	0.00
		Bottom layer	0.25	Thickest layer	0.00
CIB:					
Chillon	85	Fair		Fair	
		Bottom layer	0.03	Thickest layer	0.03
		Thickest layer	0.03	Bottom layer	0.06
CLA:					
Chipotle	63	Fair		Fair	
		Bottom layer	0.55	Thickest layer	0.07
		Thickest layer	0.63	Bottom layer	0.10
Riverwash	22	Not rated		Not rated	
COC:					
Chispa	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Chilicotal	35	Fair		Fair	
		Bottom layer	0.38	Bottom layer	0.03
		Thickest layer	0.88	Thickest layer	0.03
CPC:					
Chispa	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tenneco	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CTC:					
Corvus	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Yesum	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.05
		Thickest layer	0.00	Thickest layer	0.06
Peligro	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.50

Table 17.--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
CVC:					
Culberspeth	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Chilicotal	30	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.34	Thickest layer	0.00
CWC:					
Culberspeth, moist	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Kahn, moist	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DEB:					
Dellahunt	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DNB:					
Dellahunt	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Neimahr	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Joberanch	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DOC:					
Double	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ELC:					
Elcor	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ELE:					
Elcor	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 17.--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
EPA:					
Elcor	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dellahunt	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pokorny	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EPE:					
Elcor	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pokorny	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Walkerwells	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hollomex	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GAA:					
Gypsic Aquisalids	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HPC:					
Hollebeke	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pokorny	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HRC:					
Horsetrap	39	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
Bofecillos	39	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04

Table 17.--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
KPB:					
Kinco	43	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.07
Aguena	27	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.02
Perilla	17	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.01
LPG:					
Lampshire	50	Poor		Poor	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.00
Pantak	35	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.60	Thickest layer	0.00
LRE:					
Lark	95	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.91
		Thickest layer	0.00	Thickest layer	0.91
MAB:					
McAllister	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.01
MCB:					
Michigan	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MHA:					
Monahans	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.02
OCB:					
Ojinaga	57	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.40	Thickest layer	0.00
Corazones	28	Fair		Fair	
		Thickest layer	0.53	Thickest layer	0.01
		Bottom layer	0.60	Bottom layer	0.02

Table 17.--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
OCF:					
Ojinaga	55	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.60	Thickest layer	0.00
Corazones	36	Fair		Poor	
		Bottom layer	0.53	Bottom layer	0.00
		Thickest layer	0.55	Thickest layer	0.00
PAG:					
Pantak	74	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.00
Rock outcrop	19	Not rated		Not rated	
PRA:					
Pantera	63	Fair		Fair	
		Thickest layer	0.13	Thickest layer	0.54
		Bottom layer	0.54	Bottom layer	0.61
Riverwash	22	Not rated		Not rated	
RLA:					
Reyab, moist	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RSA:					
Reyab	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RXG:					
Rock outcrop	75	Not rated		Not rated	
Lampshire	20	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.13	Bottom layer	0.06
STB:					
Stovall	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TEC:					
Tenneco, moist	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 17.--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
VDA:					
Verhalen	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dalby	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WAB:					
Walkerwells	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
YAG:					
Yarbam	60	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Rock outcrop	30	Not rated		Not rated	
YLA:					
Yesum	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Loki	27	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Corvus	16	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 18.--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 source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
AAD:							
Aguena	90	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.28
		Low content of organic matter	0.13				
		Too sandy	0.28				
ABE:							
Allamore	57	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Cobble content	0.54	Depth to bedrock	0.00
		Low content of organic matter	0.60			Slope	0.00
		Carbonate content	0.74			Carbonate content	0.97
Beach	23	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Cobble content	0.00	Depth to bedrock	0.00
		Cobble content	0.61	Stones	0.98	Slope	0.00
		Low content of organic matter	0.88				
		Stone content	0.98				
Rock outcrop	17	Not rated		Not rated		Not rated	
ABG:							
Allamore, moist	40	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	0.60			Slope	0.00
		Carbonate content	0.74			Carbonate content	0.98
Beach, moist	40	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
				Cobble content	0.96	Slope	0.00
Rock outcrop	15	Not rated		Not rated		Not rated	
ANB:							
Antbed	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.88	Shrink-swell	0.87		
BBC:							
Beach	85	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Cobble content	0.50	Depth to bedrock	0.00
		Low content of organic matter	0.88				

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
BBD:							
Beach	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
		Low content of organic matter	0.88			Slope	0.63
BCE:							
Beach, moist	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Cobble content	0.82	Depth to bedrock	0.00
				Slope	0.98	Slope	0.00
Allamore, moist	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.98	Depth to bedrock	0.00
		Carbonate content	0.74			Slope	0.00
		Low content of organic matter	0.88				
BCG:							
Beach	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Cobble content	0.00	Depth to bedrock	0.00
		Cobble content	0.61	Slope	0.00	Slope	0.00
		Low content of organic matter	0.88				
Allamore	22	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			Depth to bedrock	0.00
		Carbonate content	0.97			No carbonate limitation	0.99
Rock outcrop	19	Not rated		Not rated		Not rated	
BED:							
Beach, moist	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
Tenneco, moist	25	Fair		Poor		Good	
		Low content of organic matter	0.88	Low strength	0.00		
		No water erosion limitation	0.99				
BHE:							
Bissett	66	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Carbonate content	0.00	Slope	0.50	Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.00
						Carbonate content	0.06

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Beach----------	22	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	0.88			Slope	0.00
BID:							
Bissett----------	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Carbonate content	0.00	Cobble content	0.88	Depth to bedrock	0.00
		Depth to bedrock	0.00			Carbonate content	0.00
		Low content of organic matter	0.82			Slope	0.96
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BIE:							
Bissett----------	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Carbonate content	0.00	Cobble content	0.08	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.50	Carbonate content	0.00
		Low content of organic matter	0.82			Slope	0.00
		Cobble content	0.89				
Rock outcrop--------	30	Not rated		Not rated		Not rated	
BIG:							
Bissett----------	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Carbonate content	0.00	Slope	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Cobble content	0.05	Rock fragments	0.00
		Low content of organic matter	0.82			Carbonate content	0.01
		Cobble content	0.85				
Rock outcrop--------	25	Not rated		Not rated		Not rated	
BRE:							
Bissett, moist------	75	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Carbonate content	0.00	Cobble content	0.99	Depth to bedrock	0.00
		Depth to bedrock	0.00			Carbonate content	0.03
		Low content of organic matter	0.82			Slope	0.84
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BRG:							
Bissett, moist------	75	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Carbonate content	0.00	Slope	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Cobble content	0.00	Rock fragments	0.00
		Cobble content	0.27			Carbonate content	0.04
		Low content of organic matter	0.82				

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BSG:							
Bissett----------	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Carbonate content	0.00	Slope	0.00	Slope	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
						Carbonate content	0.03
Rock outcrop--------	27	Not rated		Not rated		Not rated	
Beach----------	16	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	0.88			Slope	0.00
BVC:							
Bofecillos----------	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
Leyva----------	25	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Droughty	0.00	Shrink-swell	0.87	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
BVE:							
Bofecillos----------	37	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
						Slope	0.00
Leyva----------	33	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Cobble content	0.50	Rock fragments	0.00
		Too clayey	0.18	Slope	0.82	Slope	0.00
				Shrink-swell	0.87	Too clayey	0.14
Horsetrap----------	17	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.50	Rock fragments	0.00
				Cobble content	0.71	Slope	0.00
CCE:							
Changas----------	41	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
		Low content of organic matter	0.50	Slope	0.50	Slope	0.00
						Salinity	0.50

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Corazones	17	Fair		Fair		Poor	
		Droughty	0.72	Cobble content	0.94	Hard to reclaim (rock fragments)	0.00
		Carbonate content	0.80			Rock fragments	0.00
		Low content of organic matter	0.88				
CHC:							
Chilicotal	83	Fair		Good		Poor	
		Carbonate content	0.32	No cobble limitation	0.99	Rock fragments	0.00
		Low content of organic matter	0.88			Hard to reclaim (rock fragments)	0.00
CIB:							
Chillon	85	Poor		Fair		Poor	
		Droughty	0.00	Cobble content	0.42	Hard to reclaim (rock fragments)	0.00
		Too sandy	0.10			Rock fragments	0.00
		Low content of organic matter	0.18			Too sandy	0.10
		Cobble content	0.94				
CLA:							
Chipotle	63	Fair		Good		Poor	
		Droughty	0.12			Rock fragments	0.00
		Too sandy	0.47			Hard to reclaim (rock fragments)	0.00
		Low content of organic matter	0.82			Too sandy	0.47
		Too acid	0.99				
Riverwash	22	Not rated		Not rated		Not rated	
COC:							
Chispa	55	Fair		Good		Poor	
		Carbonate content	0.68			Rock fragments	0.00
		Low content of organic matter	0.88			Hard to reclaim (rock fragments)	0.26
Chilicotal	35	Fair		Good		Poor	
		Low content of organic matter	0.18			Hard to reclaim (rock fragments)	0.00
		Carbonate content	0.32			Rock fragments	0.00
						Carbonate content	0.83
CPC:							
Chispa	55	Fair		Poor		Good	
		Carbonate content	0.68	Low strength	0.00		
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Tenneco----------	35	Fair		Poor		Good	
		Low content of organic matter	0.88	Low strength	0.00		
		No water erosion limitation	0.99				
CTC:							
Corvus----------	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00				
		Sodium content	0.00				
		Low content of organic matter	0.18				
		Salinity	0.88				
Yesum----------	25	Fair		Good		Good	
		Low content of organic matter	0.18				
		No water erosion limitation	0.99				
Peligro----------	25	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Droughty	0.03				
		Low content of organic matter	0.08				
CVC:							
Culberspeth---------	65	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00			Rock fragments	0.00
		Carbonate content	0.68			Carbonate content	0.90
		Low content of organic matter	0.88				
Chilicotal----------	30	Fair		Good		Poor	
		Carbonate content	0.32	No cobble limitation	0.99	Rock fragments	0.00
		Low content of organic matter	0.50			Hard to reclaim (rock fragments)	0.00
CWC:							
Culberspeth, moist--	60	Poor		Poor		Poor	
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Droughty	0.01			Rock fragments	0.82
		Carbonate content	0.68			Carbonate content	0.94
		Low content of organic matter	0.88				

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Kahn, moist---------	35	Fair		Good		Good	
		Low content of organic matter	0.50				
		Carbonate content	0.92				
		No water erosion limitation	0.99				
DEB:							
Dellahunt----------	80	Fair		Poor		Fair	
		Carbonate content	0.46	Low strength	0.00	Too clayey	0.70
		Low content of organic matter	0.50			Carbonate content	0.95
		Too clayey	0.98				
		No water erosion limitation	0.99				
DNB:							
Dellahunt----------	30	Fair		Poor		Good	
		Low content of organic matter	0.25	Low strength	0.00		
		Carbonate content	0.46				
		Water erosion	0.68				
Neimahr----------	25	Poor		Poor		Poor	
		Depth to bedrock	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00	Low strength	0.00	Carbonate content	0.24
		Carbonate content	0.08				
		No water erosion limitation	0.99				
Joberanch----------	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Low strength	0.00	Carbonate content	0.51
		Carbonate content	0.00				
		Water erosion	0.90				
DOC:							
Double----------	90	Fair		Poor		Good	
		Low content of organic matter	0.88	Low strength	0.00		
		No water erosion limitation	0.99				
ELC:							
Elcor----------	95	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00				
		Low content of organic matter	0.92				
		No water erosion limitation	0.99				

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
ELE:							
Elcor	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.00
		Low content of organic matter	0.50				
		No water erosion limitation	0.99				
EPA:							
Elcor	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00				
		Low content of organic matter	0.92				
		No water erosion limitation	0.99				
Dellahunt	30	Fair		Poor		Fair	
		Low content of organic matter	0.25	Low strength	0.00	Carbonate content	0.92
		Carbonate content	0.46				
		Water erosion	0.68				
Pokorny	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Low strength	0.00		
		Low content of organic matter	0.50				
		Carbonate content	0.97				
EPE:							
Elcor	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Low strength	0.22	Slope	0.00
		Low content of organic matter	0.50	Slope	0.50		
		No water erosion limitation	0.99				
Pokorny	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Low strength	0.00		
		Low content of organic matter	0.50				
Walkerwells	15	Poor		Poor		Fair	
		Too alkaline	0.00	Low strength	0.00	Carbonate content	0.73
		Carbonate content	0.68	Shrink-swell	0.87		
		No water erosion limitation	0.99				

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Hollomex----------	15	Fair		Poor		Good	
		Low content of organic matter	0.50	Low strength	0.00		
		No water erosion limitation	0.99				
GAA:							
Gypsic Aquisalids---	95	Poor		Poor		Poor	
		Salinity	0.00	Low strength	0.00	Sodium content	0.00
		Sodium content	0.00			Salinity	0.00
		Low content of organic matter	0.32				
		No water erosion limitation	0.99				
HPC:							
Hollebeke----------	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				
		Low content of organic matter	0.50				
		No water erosion limitation	0.99				
Pokorny----------	35	Poor		Poor		Poor	
		Depth to cemented pan	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Droughty	0.01	Low strength	0.00		
		Low content of organic matter	0.50				
		Carbonate content	0.97				
HRC:							
Horsetrap----------	39	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Rock fragments	0.18
Bofecillos----------	39	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
KPB:							
Kinco----------	43	Fair		Good		Good	
		Low content of organic matter	0.13				
Aguena----------	27	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.28
		Low content of organic matter	0.13				
		Too sandy	0.28				

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Perilla----------	17	Fair		Good		Good	
		Low content of organic matter	0.13				
LPG:							
Lampshire----------	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Cobble content	0.00	Depth to bedrock	0.00
		Cobble content	0.03	Slope	0.50	Slope	0.00
Pantak----------	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
		Low content of organic matter	0.50			Slope	0.00
LRE:							
Lark----------	95	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.37
		Droughty	0.01				
		Low content of organic matter	0.08				
MAB:							
McAllister----------	85	Fair		Good		Good	
		Low content of organic matter	0.50				
		Carbonate content	0.92				
MCB:							
Michigan----------	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.50	Shrink-swell	0.53		
MHA:							
Monahans----------	85	Fair		Good		Fair	
		Low content of organic matter	0.18			Rock fragments	0.82
		Carbonate content	0.46			Sodium content	0.98
		Sodium content	0.98			Not too sandy	0.99
		Not too sandy	0.99				
OCB:							
Ojinaga----------	57	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	0.08			Carbonate content	0.53
		Low content of organic matter	0.60				

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Corazones----------	28	Fair		Good		Poor	
		Droughty	0.34			Rock fragments	0.00
		Carbonate content	0.80			Hard to reclaim (rock fragments)	0.00
		Low content of organic matter	0.88			Too sandy	0.99
		Too sandy	0.99				
OCF:							
Ojinaga----------	55	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	0.08			Carbonate content	0.61
		Low content of organic matter	0.60				
Corazones----------	36	Fair		Poor		Poor	
		Droughty	0.72	Slope	0.00	Rock fragments	0.00
		Carbonate content	0.80			Hard to reclaim (rock fragments)	0.00
		Low content of organic matter	0.88			Slope	0.00
PAG:							
Pantak----------	74	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	0.92	Cobble content	0.99	Depth to bedrock	0.00
						Too clayey	0.72
Rock outcrop--------	19	Not rated		Not rated		Not rated	
PRA:							
Pantera----------	63	Poor		Good		Poor	
		Too sandy	0.00			Hard to reclaim (rock fragments)	0.00
		Wind erosion	0.00			Rock fragments	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.08				
Riverwash----------	22	Not rated		Not rated		Not rated	
RLA:							
Reyab, moist--------	85	Good		Poor		Good	
		No water erosion limitation	0.99	Low strength	0.00		
				Shrink-swell	0.98		

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
RSA:							
Reyab	90	Fair		Poor		Fair	
		Water erosion	0.06	Low strength	0.00	Too clayey	0.92
		Low content of organic matter	0.50	No shrink-swell limitation	0.99		
		Too clayey	0.98				
RXG:							
Rock outcrop	75	Not rated		Not rated		Not rated	
Lampshire	20	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
						Slope	0.00
STB:							
Stovall	90	Fair		Fair		Fair	
		Carbonate content	0.68	Shrink-swell	0.87	Carbonate content	0.87
		Low content of organic matter	0.68				
TEC:							
Tenneco, moist	85	Fair		Poor		Good	
		Carbonate content	0.92	Low strength	0.00		
		No water erosion limitation	0.99				
VDA:							
Verhalen	65	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.88	Low strength	0.00		
Dalby	25	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.88	Low strength	0.00		
		No water erosion limitation	0.99				
WAB:							
Walkerwells	80	Poor		Poor		Fair	
		Too alkaline	0.00	Low strength	0.00	Too clayey	0.82
		Carbonate content	0.46	Shrink-swell	0.87	Carbonate content	0.86
		Too clayey	0.84				
		No water erosion limitation	0.99				
YAG:							
Yarbam	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
						Depth to bedrock	0.00
Rock outcrop	30	Not rated		Not rated		Not rated	

Table 18.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
YLA:							
Yesum	50	Fair		Good		Good	
		Low content of organic matter	0.18				
		No water erosion limitation	0.99				
Loki	27	Fair		Poor		Good	
		Low content of organic matter	0.02	Low strength	0.00		
		No water erosion limitation	0.99				
Corvus	16	Poor		Poor		Poor	
		Droughty	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
		Depth to cemented pan	0.00	Low strength	0.00		
		Sodium content	0.00				
		Salinity	0.88				
		No water erosion limitation	0.99				

Table 19.--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
AAD:							
Aguena	90	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
ABE:							
Allamore	57	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00				
Beach	23	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Large stones	0.80		
Rock outcrop	17	Not rated		Not rated		Not rated	
ABG:							
Allamore, moist	40	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
Beach, moist	40	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
Rock outcrop	15	Not rated		Not rated		Not rated	
ANB:							
Antbed	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.01	Hard to pack	0.38	Depth to water	1.00
BBC:							
Beach	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.32				
BBD:							
Beach	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00				
BCE:							
Beach, moist	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00				
Allamore, moist	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00				

Table 19.--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
BCG:							
Beach	35	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	0.39		
Allamore	22	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		
Rock outcrop	19	Not rated		Not rated		Not rated	
BED:							
Beach, moist	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00				
Tenneco, moist	25	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.16	Depth to water	1.00
		Seepage	0.70				
BHE:							
Bissett	66	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Seepage	0.20		
Beach	22	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
BID:							
Bissett	65	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00				
Rock outcrop	25	Not rated		Not rated		Not rated	
BIE:							
Bissett	65	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	0.12		
Rock outcrop	30	Not rated		Not rated		Not rated	
BIG:							
Bissett	65	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	0.16		
Rock outcrop	25	Not rated		Not rated		Not rated	
BRE:							
Bissett, moist	75	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00	Seepage	0.20		
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 19.--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
BRG:							
Bissett, moist	75	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	0.73		
Rock outcrop--------	20	Not rated		Not rated		Not rated	
BSG:							
Bissett----------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
Rock outcrop--------	27	Not rated		Not rated		Not rated	
Beach----------	16	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
BVC:							
Bofecillos----------	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.32				
Leyva----------	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.32	Seepage	0.70		
BVE:							
Bofecillos----------	37	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
Leyva----------	33	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Seepage	0.30		
Horsetrap----------	17	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
CCE:							
Changas----------	41	Very limited		Very limited		Very limited	
		Slope	1.00	Hard to pack	1.00	Depth to water	1.00
Corazones----------	17	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
CHC:							
Chilicotal----------	83	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Seepage	0.70	Depth to water	1.00
CIB:							
Chillon----------	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
				Large stones	0.01		

Table 19.--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
CLA:							
Chipotle	63	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
Riverwash	22	Not rated		Not rated		Not rated	
COC:							
Chispa	55	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Seepage	0.10	Depth to water	1.00
Chilicotal	35	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Seepage	1.00	Depth to water	1.00
		Slope	0.32				
CPC:							
Chispa	55	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.36	Depth to water	1.00
Tenneco	35	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
		Slope	0.32				
CTC:							
Corvus	35	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	0.70	Piping	1.00		
				Thin layer	1.00		
				Salinity	0.13		
Yesum	25	Very limited		Very limited		Very limited	
		Gypsum content	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	0.70	Piping	1.00		
		Slope	0.32				
Peligro	25	Very limited		Very limited		Very limited	
		Gypsum content	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	0.70	Piping	1.00		
		Slope	0.32				
CVC:							
Culberspeth	65	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.32				
Chilicotal	30	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Seepage	0.93	Depth to water	1.00
		Slope	0.32				

Table 19.--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
CWC:							
Culberspeth, moist	60	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.32	Piping	0.99		
Kahn, moist---------	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.32	Piping	0.43	Depth to water	1.00
		Seepage	0.03				
DEB:							
Dellahunt----------	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.64	Depth to water	1.00
DNB:							
Dellahunt----------	30	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.84	Depth to water	1.00
Neimahr----------	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
				Piping	0.23		
Joberanch----------	25	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Piping	1.00	Depth to water	1.00
		Gypsum content	1.00	Thin layer	1.00		
DOC:							
Double----------	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.01	Depth to water	1.00
		Slope	0.32				
ELC:							
Elcor----------	95	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Piping	1.00	Depth to water	1.00
		Gypsum content	1.00	Thin layer	1.00		
		Slope	0.32				
ELE:							
Elcor----------	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Piping	1.00	Depth to water	1.00
		Gypsum content	1.00	Thin layer	1.00		
		Slope	1.00				
EPA:							
Elcor----------	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to water	1.00
		Gypsum content	1.00	Piping	1.00		
		Seepage	0.03	Thin layer	1.00		
Dellahunt----------	30	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.92	Depth to water	1.00

Table 19.--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
Pokorny----------	25	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
				Piping	1.00		
				Thin layer	1.00		
EPE:							
Elcor----------	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Piping	1.00	Depth to water	1.00
		Gypsum content	1.00	Thin layer	1.00		
		Slope	1.00				
Pokorny----------	30	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
				Piping	1.00		
				Thin layer	1.00		
Walkerwells---------	15	Not limited		Very limited		Very limited	
				Piping	1.00	Depth to water	1.00
Hollomex----------	15	Very limited		Very limited		Very limited	
		Gypsum content	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	0.70	Piping	1.00		
		Slope	0.32				
GAA:							
Gypsic Aquisalids---	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.03	Salinity	1.00	Salinity and saturated zone	1.00
				Seepage	1.00	Slow refill	0.97
				Piping	1.00	Depth to saturated zone	0.25
				Depth to saturated zone	0.43	Unstable excavation walls	0.10
HPC:							
Hollebeke----------	45	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Piping	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Thin layer	1.00		
		Gypsum content	1.00				
		Slope	0.32				
		Seepage	0.01				
Pokorny----------	35	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Slope	0.32	Piping	1.00		
				Thin layer	1.00		

Table 19.--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
HRC:							
Horsetrap	39	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		
Bofecillos	39	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.32				
KPB:							
Kinco	43	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
Aguena	27	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
Perilla	17	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
LPG:							
Lampshire	50	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	0.97		
Pantak	35	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
LRE:							
Lark	95	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Unstable excavation walls	1.00
		Gypsum content	1.00	Piping	1.00	Depth to saturated zone	0.81
		Slope	1.00				
MAB:							
McAllister	85	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
MCB:							
Michigan	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Hard to pack	0.58	Depth to water	1.00
MHA:							
Monahans	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.98	Depth to water	1.00
OCB:							
Ojinaga	57	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
Corazones	28	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00

Table 19.--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
OCF:							
Ojinaga	55	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
				Thin layer	1.00		
Corazones	36	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00				
PAG:							
Pantak	74	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
Rock outcrop	19	Not rated		Not rated		Not rated	
PRA:							
Pantera	63	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
Riverwash	22	Not rated		Not rated		Not rated	
RLA:							
Reyab, moist	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.03	Piping	0.13	Depth to water	1.00
RSA:							
Reyab	90	Somewhat limited		Not limited		Very limited	
		Seepage	0.03			Depth to water	1.00
RXG:							
Rock outcrop	75	Not rated		Not rated		Not rated	
Lampshire	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00				
STB:							
Stovall	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
TEC:							
Tenneco, moist	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.57	Depth to water	1.00
		Slope	0.32				
VDA:							
Verhalen	65	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Depth to water	1.00
Dalby	25	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.95	Depth to water	1.00

Table 19.--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
WAB:							
Walkerwells---------	80	Somewhat limited		Very limited		Very limited	
		Seepage	0.03	Hard to pack	1.00	Depth to water	1.00
YAG:							
Yarbam ----------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
Rock outcrop--------	30	Not rated		Not rated		Not rated	
YLA:							
Yesum----------	50	Very limited		Very limited		Very limited	
		Gypsum content	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	0.70	Piping	1.00		
Loki----------	27	Very limited		Very limited		Very limited	
		Gypsum content	1.00	Seepage	1.00	Depth to water	1.00
		Seepage	0.70	Piping	1.00		
Corvus----------	16	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Seepage	1.00	Depth to water	1.00
		Gypsum content	1.00	Piping	1.00		
				Thin layer	1.00		
				Salinity	0.13		

Table 20.--Engineering Properties

(Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
AAD:												
Aguena----------	0-6	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	100	100	93-99	33-39	0-22	NP-4
	6-80	*Loamy fine sand, Fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	100	98-100	91-99	32-39	0-21	NP-4
ABE:												
Allamore--------	0-8	*Very gravelly loam	*GC, GC-GM	*A-6, A-1-b	0	8-23	39-60	36-59	29-55	20-40	21-34	5-15
	8-19	*Very cobbly loam, Very cobbly fine sandy loam	*GC, GC-GM	*A-2-6, A-6, A-1-b	0-1	8-61	45-69	42-68	33-63	23-47	20-36	4-16
	19-29	*Bedrock			---	---	---	---	---	---	---	---
Beach----------	0-9	*Very cobbly sandy loam	*GC	*A-2-6, A-2-4	0-10	32-40	55-81	53-80	37-66	18-37	24-37	8-17
	9-19	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---
ABG:												
Allamore, moist-	0-8	*Very gravelly loam	*GC	*A-2-6, A-2-4	0	0-12	38-55	35-53	29-49	20-37	23-37	7-17
	8-17	*Very gravelly loam, Very cobbly sandy loam, very cobbly loam, very gravelly sandy loam	*GC	*A-2-6, A-2-4	0	0-24	36-55	33-53	26-49	19-37	24-38	7-18
	17-27	*Bedrock			---	---	---	---	---	---	---	---
Beach, moist----	0-9	*Very channery loam	*GC, GC-GM	*A-2-4, A-1-b, A-6	0	16-24	41-66	39-65	33-61	23-44	21-34	6-13
	9-19	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---
ANB:												
Antbed----------	0-4	*Loam	*CL	*A-6	0	0-8	92-100	85-100	74-100	54-86	33-57	13-30
	4-17	*Clay loam, Clay, silty clay loam, silty clay	*CH, CL	*A-7-6, A-6	0	0-8	92-100	85-100	73-100	56-89	39-62	19-36
	17-80	*Clay, Clay loam, silty clay loam, silty clay	*CH, CL	*A-7-6, A-6	0	0-8	92-100	84-100	66-100	52-89	38-64	19-40

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BBC:												
Beach----------	0-9	*Very cobbly sandy loam	*GC, GC-GM	*A-2-4, A-2-6, A-1-a	0-4	19-28	42-69	39-67	29-59	14-34	21-37	6-17
	9-19	*Bedrock			---	---	---	---	---	---	---	---
BBD:												
Beach----------	0-9	*Very gravelly coarse sandy loam	*GC, GP-GC	*A-2-4, A-2-6, A-1-a	0-5	6-17	37-60	34-59	20-43	11-28	21-37	6-17
	9-19	*Bedrock			---	---	---	---	---	---	---	---
BCE:												
Beach, moist----	0-6	*Very channery loam	*GC	*A-6, A-2-6	0	19-29	43-68	42-67	35-61	26-46	28-39	12-18
	6-16	*Bedrock			---	---	---	---	---	---	---	---
Allamore, moist-	0-7	*Very gravelly loam	*GC	*A-2-6, A-6, A-2-4	0	11-23	41-59	38-57	31-54	22-40	23-36	7-17
	7-9	*Very gravelly loam	*GC	*A-2-6, A-6, A-2-4	0	7-24	36-58	33-56	27-53	20-39	24-37	7-17
	9-19	*Bedrock			---	---	---	---	---	---	---	---
BCG:												
Beach----------	0-5	*Very cobbly sandy loam	*GC-GM	*A-2-4	0-4	32-41	57-81	55-80	41-71	20-41	23-38	7-18
	5-15	*Bedrock			---	---	---	---	---	---	---	---
Allamore--------	0-4	*Very gravelly loam	*GC, GC-GM	*A-2-6, A-1-b	0	0-4	51-63	32-54	26-50	18-37	21-34	5-15
	4-11	*Extremely gravelly fine sandy loam, Very gravelly fine sandy loam, extremely gravelly loam, very gravelly loam	*GP-GC, GC	*A-2-6, A-1-a	0	5-11	25-63	18-58	16-57	6-28	20-37	4-17
	11-21	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BED:												
Beach, moist----	0-10	*Very gravelly loam	*GC	*A-2-6 A-2-4, A-6	0	0-4	31-56	28-54	23-49	16-36	24-34	8-13
	10-20	*Bedrock			---	---	---	---	---	---	---	---
Tenneco, moist--	0-10	*Loam	*CL	*A-4, A-6	0	0	92-100	91-100	73-92	53-70	27-43	9-18
	10-17	*Clay loam, Loam, silt loam	*CL	*A-6, A-7-6	0	0	92-100	91-100	80-98	62-78	35-47	17-24
	17-80	*Loam, Clay loam	*CL, SC	*A-6, A-7-6	0	0-8	85-100	84-100	67-100	49-78	26-45	9-25
BHE:												
Bissett---------	0-6	*Very gravelly loam	*GC-GM, GC	*A-2-6	0	0-18	35-52	32-50	26-48	18-35	28-45	12-22
	6-13	*Very gravelly loam, Very cobbly loam	*GC-GM, GC	*A-2-6	0	0-12	33-52	30-50	26-49	19-36	34-47	17-24
	13-23	*Bedrock			---	---	---	---	---	---	---	---
Beach----------	0-11	*Very gravelly silt loam	*GC, GC-GM	*A-4, A-1-b	0-5	0-11	38-55	35-53	30-53	24-45	21-37	6-17
	11-21	*Bedrock			---	---	---	---	---	---	---	---
BID:												
Bissett---------	0-4	*Very gravelly loam	*GC, GC-GM	*A-2-6, A-2-4	0	0-24	38-60	35-58	29-56	20-42	25-43	7-22
	4-17	*Very gravelly loam, Very cobbly sandy clay loam, very gravelly sandy clay loam, very cobbly loam	*GC	*A-2-6	0	0-31	38-60	35-58	31-58	23-45	34-45	17-25
	17-27	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---
BIE:												
Bissett---------	0-2	*Very cobbly loam	*GC	*A-2-6	0	0-31	38-63	35-61	29-58	20-43	28-43	12-22
	2-9	*Very cobbly loam, Very gravelly loam	*GC	*A-2-6	0	0-31	38-63	35-61	31-59	22-44	34-45	17-25
	9-19	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BIG:												
Bissett---------	0-4	*Very gravelly loam	*GC	*A-2-6	0	0-6	31-52	28-50	23-48	16-35	28-43	12-22
	4-14	*Very cobbly loam, Very gravelly loam	*GC	*A-6	0	22-49	54-75	52-73	45-72	32-53	34-45	17-25
	14-24	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---
BRE:												
Bissett, moist--	0-5	*Very gravelly loam	*GC, GC-GM	*A-2-6	0	0-24	38-59	35-57	29-54	20-40	28-43	12-22
	5-11	*Very gravelly loam, Very channery loam	*GC	*A-2-6	0	0-20	36-56	33-54	29-53	21-39	34-45	17-25
	11-21	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---
BRG:												
Bissett, moist--	0-6	*Very cobbly silt loam	*GC, SC, CL	*A-6	0	24-49	54-85	52-84	46-84	39-75	28-43	12-22
	6-14	*Very cobbly silt loam, Extremely cobbly loam, very cobbly loam, very gravelly loam	*GC, SC	*A-6	0	24-41	48-75	45-74	40-74	34-65	28-43	12-22
	14-24	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---
BSG:												
Bissett---------	0-7	*Very gravelly loam	*GC	*A-2-6	0	1-10	32-53	29-51	24-49	17-36	28-45	12-22
	7-17	*Very gravelly loam, Very cobbly loam	*GC	*A-2-6	0	4-24	38-54	35-52	31-51	22-38	34-47	17-24
	17-27	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---
Beach----------	0-9	*Very gravelly loam	*GC	*A-2-6, A-2-4	0	0-4	30-55	27-53	23-51	16-38	26-37	9-17
	9-19	*Bedrock			---	---	---	---	---	---	---	---

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BVC:												
Bofecillos------	0-9	*Very gravelly loam	*SC	*A-2-6	0	0-11	68-79	17-50	15-46	11-35	28-39	12-17
	9-19	*Bedrock			---	---	---	---	---	---	---	---
Leyva----------	0-6	*Very gravelly clay loam	*GC	*A-2-7	0	0-12	29-64	26-62	23-59	18-47	43-51	24-28
	6-12	*Very gravelly clay	*GC	*A-2-7, A-7-6	0	7-23	27-54	23-52	20-50	17-43	50-59	30-36
	12-22	*Bedrock			---	---	---	---	---	---	---	---
BVE:												
Bofecillos------	0-8	*Very gravelly sandy clay loam	*GC, GP-GC	*A-2-6	0	0	28-55	25-53	21-48	11-28	28-40	12-18
	8-18	*Bedrock			---	---	---	---	---	---	---	---
Leyva----------	0-10	*Very cobbly clay loam	*GC	*A-7-6	0	30-43	58-87	56-87	50-83	40-66	43-51	24-28
	10-15	*Very gravelly clay	*GC	*A-2-7, A-7-6	0	0-6	31-51	28-49	24-47	21-41	50-59	30-36
	15-25	*Bedrock			---	---	---	---	---	---	---	---
Horsetrap-------	0-8	*Very cobbly sandy clay loam	*GC	*A-2-6, A-7-6	0	20-36	50-75	48-74	40-71	22-43	30-45	13-22
	8-14	*Very cobbly sandy clay loam, Very gravelly clay loam, extremely gravelly loam, very gravelly sandy loam, very gravelly loam	*GC	*A-2-6, A-7-6	0	20-36	50-75	48-74	39-69	21-42	29-45	12-22
	14-24	*Bedrock			---	---	---	---	---	---	---	---
CCE:												
Changas---------	0-4	*Sandy clay loam	*CL, SC	*A-6	0	0	95-100	92-100	77-100	43-69	36-58	16-33
	4-80	*Clay, Silty clay	*CH, CL	*A-7-6	0	0	95-100	90-100	75-100	64-91	49-70	29-44
Corazones-------	0-4	*Very gravelly loam	*GC	*A-2-4	0	7-17	31-57	28-56	24-51	17-37	25-33	8-13
	4-12	*Very gravelly loam	*GC	*A-2-4, A-2-6	0	0-17	27-53	24-51	20-47	15-34	25-32	8-13
	12-80	*Extremely gravelly loam	*GP-GC, GC	*A-2-6, A-2-4	0	12-21	20-51	17-49	14-46	10-34	24-37	7-17

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CHC:												
Chilicotal------	0-6	*Very gravelly loam	*GC	*A-2-4, A-2-6	0	0-3	43-52	41-50	31-42	24-34	26-36	8-15
	6-80	*Very gravelly loam, Extremely gravelly loam, gravelly clay loam, very gravelly sandy loam	*GC	*A-2-4, A-6	0	7-18	36-56	33-54	25-48	19-39	25-40	7-19
CIB:												
Chillon---------	0-7	*Extremely gravelly sandy loam	*GP-GC, GC	*A-2-4, A-2-6	0	7-27	20-56	17-54	12-44	6-23	22-30	7-12
	7-20	*Extremely gravelly coarse sandy loam	*GP-GC, GC, GP-GM	*A-1-a, A-2-4	0	7-27	20-56	17-54	10-37	5-23	16-27	1-10
	20-36	*Extremely gravelly loamy coarse sand	*GP-GC, GC, GP-GM	*A-1-a, A-2-4	0	24-27	27-47	24-44	13-28	5-14	18-28	3-10
	36-80	*Extremely cobbly coarse sandy loam	*GP-GC, GC, GW-GM	*A-2-4, A-1-a	0	25-34	32-44	29-41	17-27	9-16	18-28	3-10
CLA:												
Chipotle--------	0-7	*Extremely gravelly loamy sand	*GP-GM, GC	*A-1-a, A-2-4	0	0-5	20-53	17-51	13-44	5-19	17-26	2-8
	7-16	*Extremely gravelly sand	*GP, GP-GC	*A-1-a, A-1-b	0	0-5	25-55	22-53	17-42	2-7	0-21	NP-4
	16-60	*Extremely gravelly loamy sand	*GP-GM, GC-GM	*A-1-a, A-2-4	0	0-5	22-56	18-54	14-45	5-19	17-25	2-7
	60-80	*Extremely gravelly loamy sand	*GP-GC, GC-GM, GP	*A-1-a, A-1-b	0	0-5	22-56	18-54	14-45	4-14	17-24	2-6
Riverwash-------	0-80	*			---	---	---	---	---	---	---	---
COC:												
Chispa----------	0-4	*Gravelly sandy clay loam	*SC, CL	*A-2-6, A-6	0	0	66-100	65-100	54-95	29-56	28-45	10-21
	4-80	*Gravelly sandy clay loam, Loam, gravelly loam, sandy clay loam	*GC, SC	*A-2-6, A-6	0	0	55-85	53-85	45-79	24-47	28-41	11-20

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Chilicotal------	0-6	*Very gravelly sandy loam	*GC, GP-GC	*A-2-4, A-2-6, A-1-a	0	0	30-52	27-50	19-40	9-21	22-32	6-11
	6-31	*Extremely gravelly sandy loam, Very gravelly sandy loam, extremely gravelly sandy loam	*GP-GC, GC	*A-2-4, A-2-6, A-1-a	0	0	15-31	15-31	11-25	5-14	21-33	6-13
	31-80	*Very gravelly sandy loam	*GC, GP-GC	*A-2-4, A-2-6, A-1-a	0	0	27-50	27-50	19-41	10-23	21-32	6-13
CPC:												
Chispa----------	0-6	*Sandy loam	*SM, SC-SM	*A-4, A-6	0	0	76-100	75-100	58-94	30-57	22-43	4-18
	6-16	*Sandy clay loam, Loam, clay loam	*CL, SC	*A-6, A-7-6	0	0	78-100	77-100	65-100	35-61	30-47	12-24
	16-80	*Clay loam, Sandy clay loam, loam	*CL, SC	*A-6, A-7-6	0	0	78-100	77-100	62-96	47-75	27-45	9-23
Tenneco---------	0-6	*Loam	*CL, CL-ML	*A-4, A-6	0	0	92-100	91-100	72-92	51-69	24-41	7-17
	6-31	*Sandy clay loam, Clay loam, loam	*CL, SC	*A-6, A-7-6	0	0	92-100	92-100	78-93	44-56	35-45	16-22
	31-80	*Clay loam, Sandy clay loam, loam	*CL	*A-6, A-7-6	0	0	92-100	92-100	77-95	60-76	34-45	16-25
CTC:												
Corvus----------	0-2	*Gypsiferous loam	*CL-ML, CL	*A-4, A-6	0	0	100	100	96-100	64-74	22-33	6-13
	2-6	*Gypsiferous loam	*CL, CL-ML	*A-4, A-6	0	0	100	100	94-100	62-72	21-32	6-13
	6-9	*Gypsiferous cemented material			---	---	---	---	---	---	---	---
	9-80	*Gypsiferous loam	*CL, CL-ML	*A-4, A-6	0	0	100	100	94-100	62-72	21-31	6-13
Yesum----------	0-2	*Fine sandy loam	*SC, SC-SM	*A-4, A-2-4	0	0	100	95-100	84-96	34-43	22-31	6-11
	2-7	*Coarse sandy loam	*SC-SM, SM	*A-4, A-2-4	0	0	100	95-100	56-69	30-42	16-26	1-9
	7-80	*Gypsiferous coarse sandy loam, Gypsiferous loam, gypsiferous silt loam	*SC	*A-4	0	0	100	95-100	56-73	33-48	22-37	7-18
Peligro---------	0-1	*Fine sandy loam	*SC, SC-SM	*A-4	0	0	100	100	89-96	36-43	21-29	6-11
	1-80	*Gypsiferous coarse sand	*SM, SW-SM	*A-1-b	0	0	100	100	44-49	10-15	0-17	NP-2

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CVC:												
Culberspeth-----	0-2	*Gravelly loam	*CL	*A-4, A-6, A-2-4	0	0	48-84	46-84	39-83	28-62	23-40	5-18
	2-8	*Gravelly loam, Very gravelly clay loam, gravelly loam	*CL	*A-6, A-2-4	0	0	53-77	51-76	40-70	29-53	23-38	6-18
	8-18	*Cemented material			---	---	---	---	---	---	---	---
Chilicotal------	0-3	*Loam	*CL, ML	*A-4	0	0-4	83-92	83-91	62-80	48-64	25-45	7-18
	3-12	*Gravelly loam	*SC, CL	*A-6, A-4	0	0	65-86	58-83	44-71	35-58	28-43	9-19
	12-80	*Extremely gravelly loam, Gravelly clay loam, very gravelly sandy loam, very gravelly loam	*GC	*A-2-6, A-6	0	13-26	31-54	28-52	20-44	16-36	25-41	8-20
CWC:												
Culberspeth, moist----------	0-7	*Gravelly loam	*SC-SM, CL	*A-4, A-2-4, A-6	0	0	48-84	46-84	40-84	28-63	23-40	5-18
	7-19	*Loam	*CL, GC	*A-6, A-2-4	0	0	53-92	51-91	41-86	30-65	23-38	6-18
	19-29	*Cemented material			---	---	---	---	---	---	---	---
Kahn, moist-----	0-8	*Very fine sandy loam	*CL, CL-ML	*A-4, A-6	0	0	92-100	92-100	90-100	52-64	23-33	6-14
	8-24	*Loam	*CL	*A-6, A-4	0	0	84-95	84-95	70-90	51-68	26-39	9-19
	24-80	*Sandy clay loam, Silt loam	*SC, CL	*A-6, A-4	0	0	85-95	85-95	66-86	36-51	27-40	9-20
DEB:												
Dellahunt-------	0-6	*Silt loam	*ML, CL-ML	*A-4	0	0	98-100	96-100	88-100	81-98	24-42	7-18
	6-30	*Silty clay loam, Loam, silt loam	*CL	*A-6, A-7-6	0	0	98-100	96-100	83-100	79-99	28-45	12-25
	30-80	*Silt loam, Silty clay loam	*CL	*A-6, A-7-6	0	0	98-100	96-100	91-100	87-100	28-45	12-25
DNB:												
Dellahunt-------	0-4	*Loam	*CL	*A-4, A-6	0	0	96-100	96-100	86-100	65-87	20-44	3-18
	4-17	*Clay loam	*CL	*A-6, A-7-6	0	0	98-100	98-100	96-100	79-89	35-45	18-25
	17-80	*Silt loam, Very fine sandy loam, loam	*CL, SC-SM	*A-6,	0	0	96-100	93-100	88-100	82-100	28-45	12-25

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Neimahr---------	0-5	*Very fine sandy loam	*CL,	*A-4	0	0	98-100	95-100	93-100	55-73	27-45	9-21
	5-17	*Clay loam, Loam, silt loam, silty clay loam	*CL,	*A-6, A-7-6, A-4	0	0	100	98-100	75-96	56-77	26-46	9-24
	17-27	*Bedrock			---	---	---	---	---	---	---	---
Joberanch-------	0-3	*Loam	*CL, SC-SM	*A-4, A-6	0	0	98-100	95-100	86-100	65-83	23-41	6-17
	3-8	*Clay loam	*CL	*A-7-6, A-6	0	0	98-100	94-100	80-100	64-85	27-47	9-22
	8-12	*Loam	*CL	*A-6, A-4	0	0	100	100	89-100	69-84	25-41	9-21
	12-80	*Gypsiferous cemented material			---	---	---	---	---	---	---	---
DOC:												
Double----------	0-4	*Loam	*CL, SC-SM	*A-4, A-6	0	0	76-100	75-100	63-99	44-74	24-38	6-17
	4-23	*Loam, Clay loam	*CL, SC	*A-6, A-7-6	0	0	76-100	75-100	64-96	48-74	33-43	14-21
	23-80	*Clay loam, Loam	*CL	*A-6, A-7-6	0	0	76-100	75-100	65-96	50-77	35-45	17-25
ELC:												
Elcor----------	0-7	*Gypsiferous loam	*CL, ML	*A-4, A-6	0	0	100	94-100	88-100	66-82	18-31	3-12
	7-17	*Bedrock			---	---	---	---	---	---	---	---
ELE:												
Elcor----------	0-3	*Gypsiferous loam	*CL-ML,	*A-4, A-6	0	0	95-100	95-100	91-100	70-89	21-36	6-17
	3-7	*Gypsiferous loam	*CL-ML,	*A-4, A-6	0	0	100	95-100	84-100	64-83	21-36	6-17
	7-17	*Bedrock			---	---	---	---	---	---	---	---
EPA:												
Elcor----------	0-19	*Gypsiferous loam	*CL, ML	*A-4, A-6	0	0	100	94-100	88-100	66-82	18-31	3-12
	19-80	*Bedrock			---	---	---	---	---	---	---	---
Dellahunt-------	0-9	*Silt loam	*CL, ML	*A-4, A-6	0	0	98-100	95-100	91-100	84-100	27-43	9-18
	9-34	*Silt loam	*CL,	*A-6,	0	0	98-100	95-100	90-100	86-100	29-45	13-25
	34-80	*Silt loam	*CL,	*A-6,	0	0	98-100	94-100	90-100	84-100	28-45	12-25
Pokorny---------	0-1	*Loam	*CL-ML, CL	*A-4, A-6	0	0	100	98-100	96-100	73-93	22-44	6-19
	1-17	*Gypsiferous silty clay loam, Gypsiferous silt loam	*CL,	*A-6, A-4	0	0	95-100	92-100	79-100	69-92	25-42	9-22
	17-80	*Cemented material			---	---	---	---	---	---	---	---

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EPE:												
Elcor----------	0-7	*Gypsiferous silt loam	*CL, CL-ML	*A-6, A-4	0	0	100	94-100	79-99	64-83	21-36	6-17
	7-17	*Bedrock			---	---	---	---	---	---	---	---
Pokorny---------	0-14	*Gypsiferous silty clay loam	*CL,	*A-6, A-4, A-7-6	0	0	94-100	90-100	75-100	67-91	25-42	9-22
	14-59	*Cemented material			---	---	---	---	---	---	---	---
Hollomex--------	0-2	*Loam	*CL, CL-ML	*A-4	0	0	100	91-100	87-100	66-77	22-28	6-10
	2-80	*Gypsiferous loam, Gypsiferous sandy clay loam, gypsiferous fine	*CL, SC-SM	*A-6	0	0	100	90-100	85-100	66-82	27-39	12-19
Walkerwells-----	0-6	*Very fine sandy loam	*ML, CL-ML	*A-4	0	0	100	98-100	95-100	54-61	28-41	7-11
	6-42	*Silty clay loam	*CL	*A-7-6, A-6	0	0	100	100	95-100	91-100	35-49	14-24
	42-80	*Silty clay loam sandy loam	*CL	*A-7-6, A-6	0	0	100	100	97-100	94-99	39-46	21-25
GAA:												
Gypsic Aquisalids-----	0-5	*Silt loam	*CL,	*A-4	0	0	100	100	89-100	73-86	25-39	9-19
	5-80	*Silty clay loam, Silt loam	*CL,	*A-6,	0	0	100	100	95-100	84-90	34-42	18-22
HPC:												
Hollebeke-------	0-1	*Loam	*CL, ML	*A-4	0	0	100	94-100	80-93	54-66	16-27	2-8
	1-4	*Gypsiferous silt loam	*ML, CL-ML	*A-4	0	0	100	94-100	81-94	64-76	16-26	2-8
	4-13	*Cemented material			---	---	---	---	---	---	---	---
	13-22	*Bedrock			---	---	---	---	---	---	---	---
Pokorny---------	0-2	*Gypsiferous loam	*CL-ML, CL	*A-4, A-6	0	0	100	98-100	96-100	73-85	22-37	6-13
	2-19	*Gypsiferous clay loam, Gypsiferous silt loam, gypsiferous loam, gypsiferous silty clay loam	*CL,	*A-6, A-4, A-7-6	0	0	94-100	90-100	69-94	50-73	25-42	9-22
	19-29	*Cemented material			---	---	---	---	---	---	---	---

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
HRC:												
Horsetrap-------	0-9	*Gravelly sandy loam	*GC	*A-2-6, A-2-4	0	0-12	61-92	35-83	27-72	14-41	24-38	8-16
	9-17	*Very gravelly sandy loam, Very gravelly sandy clay loam, extremely gravelly loam, very gravelly loam	*SC,	*A-2-6, A-2-4	0	0-6	79	28-50	21-42	10-23	26-40	9-18
	17-27	*Bedrock			---	---	---	---	---	---	---	---
Bofecillos------	0-9	*Very gravelly sandy loam	*SC, SP-SC	*A-2-6	0	0-11	69-80	19-53	15-44	7-24	28-39	12-17
	9-19	*Bedrock			---	---	---	---	---	---	---	---
KPB:												
Kinco----------	0-8	*Loamy coarse sand	*SC, SC-SM	*A-2-4	0	0	93-100	92-100	44-55	15-23	21-31	4-10
	8-31	*Fine sandy loam, Loam	*SC, SC-SM	*A-4, A-2-4	0	0	100	92-100	81-96	33-44	20-30	6-12
	31-80	*Loamy sand, Loamy very fine sand, fine sandy loam, loamy coarse sand	*SM, SC-SM	*A-4, A-2-4	0	0	100	93-100	71-89	26-40	0-27	NP-10
Aguena----------	0-4	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	100	100	93-99	33-39	0-22	NP-4
	4-80	*Loamy fine sand, Fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	100	98-100	91-99	32-39	0-21	NP-4
Perilla---------	0-16	*Fine sandy loam	*SM	*A-4, A-2-4	0	0	92-100	92-100	77-97	29-44	18-33	2-12
	16-37	*Fine sandy loam, Loamy sand, sandy loam	*SC, SC-SM	*A-4, A-2-4	0	0	100	100	85-95	33-43	18-30	4-12
	37-80	*Fine sandy loam, Loamy fine sand, coarse sandy loam	*SC, SC-SM	*A-4, A-2-4	0	0	100	100	85-95	32-42	18-30	4-12
LPG:												
Lampshire-------	0-4	*Extremely cobbly coarse sandy loam	*GC	*A-2-6	0	21-47	38-65	35-64	22-50	13-33	0-33	NP-12
	4-14	*Bedrock			---	---	---	---	---	---	---	---

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Pantak----------	0-5	*Very gravelly sandy clay loam	*GC, GP-GC	*A-2-6, A-2-4, A-2-7	0	0-11	31-55	28-53	22-53	11-32	26-46	9-24
	5-10	*Extremely gravelly clay loam, Very gravelly sandy clay loam, very gravelly clay loam, extremely gravelly sandy clay loam	*GC, GP-GC	*A-2-7, A-2-6	0	0-5	20-43	16-40	14-39	11-31	37-47	19-25
	10-20	*Bedrock			---	---	---	---	---	---	---	---
LRE:												
Lark----------	0-18	*Gypsiferous sand	*SP-SM,	*A-3	0	0	100	100	75-77	6-8	0-14	NP
	18-80	*Gypsiferous sand, Gypsiferous fine sand, gypsiferous coarse sand	*SP-SM,	*A-3	0	0	100	100	75-77	6-8	0-14	NP
MAB:												
McAllister------	0-8	*Fine sandy loam	*SC-SM,	*A-4, A-2-4	0	0	58-100	56-100	52-100	22-51	27-41	9-19
	8-20	*Sandy clay loam, Clay loam, loam	*CL, SC	*A-6, A-7-6, A-2-6	0	0	61-100	59-100	45-93	24-57	28-47	12-25
	20-63	*Sandy clay loam, Clay loam, loam	*CL, SC	*A-6, A-7-6, A-2-6	0	0	61-100	59-100	49-99	27-62	28-47	12-25
	63-80	*Fine sandy loam, Loam	*SC, SC-SM, CL	*A-4, A-6	0	0	72-100	71-100	64-100	27-50	25-38	9-19
MCB:												
Michigan--------	0-7	*Clay	*CH, CL	*A-7-6	0	0	95-100	94-100	82-100	65-84	45-63	24-36
	7-21	*Clay, Silty clay loam, clay loam, silty clay	*CH, CL	*A-7-6	0	0	95-100	94-100	81-100	65-84	43-61	24-36
	21-80	*Clay, Silty clay, silty clay loam, clay loam	*CH, CL	*A-7-6	0	0	83-100	82-100	71-100	57-84	43-61	24-36
MHA:												
Monahans--------	0-2	*Fine sand	*SM,	*A-2-4	0	0	91-100	82-100	76-100	9-23	0-28	NP-10
	2-6	*Fine sandy loam, Loam	*SC-SM,	*A-2-4, A-4	0	0	91-100	82-100	73-96	28-42	19-28	4-10
	6-16	*Fine sandy loam, Loam	*SC-SM,	*A-2-4, A-6	0	0	100	92-100	81-95	33-43	21-29	6-11
	16-80	*Fine sandy loam, Loam	*SC-SM,	*A-4, A-2-4	0	0	92-100	84-100	74-95	29-41	19-27	4-10

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
OCB:												
Ojinaga---------	0-3	*Gravelly loam	*SC	*A-2-4, A-4	0	0-7	32-77	29-76	25-72	18-54	25-37	8-17
	3-10	*Very gravelly sandy clay loam, Very gravelly loam, extremely gravelly loam	*GC, GP-GC	*A-2-6, A-2-4	0-3	0-7	23-55	19-53	16-50	8-29	24-39	8-18
	10-20	*Cemented material			---	---	---	---	---	---	---	---
Corazones-------	0-3	*Very gravelly fine sandy loam	*GC	*A-2-4	0	0	30-70	27-69	24-69	10-39	21-41	5-21
	3-11	*Extremely gravelly fine sandy loam, Very gravelly sandy loam, extremely gravelly loam, very gravelly loam, extremely gravelly sandy loam	*GP-GC, GC	*A-2-6, A-2-4	0-1	5-9	22-58	19-57	17-57	7-29	22-37	6-17
	11-80	*Extremely gravelly fine sandy loam, Very gravelly sandy loam, extremely gravelly loam, very gravelly loam, extremely gravelly sandy loam	*GC, GP-GC	*A-2-6, A-2-4	0-1	7-10	22-60	19-58	17-58	7-30	20-37	4-17
OCF:												
Ojinaga---------	0-4	*Very gravelly sandy clay loam	*GC	*A-2-6, A-2-4	0	0-7	34-56	31-54	24-49	13-29	25-39	8-19
	4-11	*Extremely gravelly sandy clay loam, Very gravelly sandy clay loam, extremely gravelly loam	*GP-GC, GC	*A-2-6, A-2-4	0-1	0-4	21-55	18-53	14-48	7-28	24-39	8-18
	11-21	*Cemented material			---	---	---	---	---	---	---	---
Corazones-------	0-2	*Extremely gravelly sandy clay loam	*GP-GC, SC	*A-2-6, A-6, A-2-4	0	0-5	25-79	22-78	18-70	9-39	25-37	8-17
	2-80	*Extremely gravelly sandy clay loam	*GC, GP-GC	*A-2-6, A-2-4	0-5	0-5	27-56	24-54	18-48	9-27	25-37	8-17

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
PAG:												
Pantak----------	0-4	*Very gravelly coarse sandy loam	*GC, GP-GC	*A-2-4 A-1-a, A-2-6	0	0-11	31-55	28-53	18-39	10-25	22-34	6-13
	4-8	*Very cobbly sandy clay loam, Extremely cobbly sandy clay loam	*GC, GP-GC	*A-2-6, A-2-7	0	26-39	29-57	25-55	19-49	10-30	31-47	13-25
	8-18	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---
PRA:												
Pantera---------	0-3	*Gravelly loamy coarse sand	*SM, GP-GM, SC-SM	*A-1-a	0	0-17	38-78	35-77	18-45	6-19	0-22	NP-6
	3-20	*Very gravelly coarse sand	*GP-GM, GC-GM	*A-1-b, A-1-a	0-5	0-11	33-55	30-53	14-28	3-8	0-20	NP-4
	20-80	*Extremely gravelly coarse sand	*GP-GM, GC-GM	*A-1-a	0-5	6-16	20-43	17-40	8-21	1-6	0-20	NP-4
Riverwash-------	0-80	*			---	---	---	---	---	---	---	---
RLA:												
Reyab, moist----	0-11	*Loam	*CL, ML	*A-6	0	0	93-100	93-100	86-100	69-83	30-45	11-18
	11-44	*Clay loam, Silt loam, silty clay loam	*CL,	*A-7-6, A-6	0	0	94-100	94-100	84-100	68-90	31-49	12-25
	44-80	*Loam, Silty clay loam, silt loam	*CL,	*A-6, A-7-6	0	0	91-100	90-100	85-100	68-92	28-45	12-25
RSA:												
Reyab----------	0-3	*Silt loam	*ML, CL-ML	*A-4	0	0	100	100	96-100	84-99	22-42	4-15
	3-31	*Silty clay loam, Clay loam, silt loam	*CL,	*A-7-6, A-6	0	0	100	100	94-100	90-99	37-49	18-25
	31-80	*Clay loam, Loam	*CL	*A-7-6, A-6	0	0	100	100	91-100	76-85	36-46	18-25
RXG:												
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---
Lampshire-------	0-4	*Very gravelly coarse sandy loam	*GC, GP-GC	*A-2-4, A-1-a	0	0-11	25-52	21-50	13-33	7-19	22-31	6-10
	4-14	*Bedrock			---	---	---	---	---	---	---	---

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
STB:												
Stovall---------	0-12	*Clay loam	*CL	*A-7-6, A-6	0	0	95-100	89-100	79-100	64-84	29-48	8-22
	12-23	*Clay loam, Silty clay loam, loam	*CL	*A-7-6, A-6	0	0	95-100	88-100	75-98	61-82	29-46	8-23
	23-80	*Silt loam, Loam	*CL, ML	*A-6	0	0	95-100	85-100	80-100	74-100	20-37	1-15
TEC:												
Tenneco, moist--	0-7	*Silt loam	*ML, CL	*A-4, A-6	0	0	90-100	76-100	69-100	57-87	27-43	9-18
	7-42	*Silt loam	*CL,	*A-6,	0	0	90-100	76-100	71-97	60-83	35-41	16-19
	42-61	*Loam	*CL, SC	*A-6	0	0	90-100	76-100	66-96	47-72	28-39	12-19
	61-80	*Loam	*CL, SC	*A-6	0	0	90-100	76-100	66-96	47-72	28-39	12-19
VDA:												
Verhalen--------	0-8	*Silty clay	*CH	*A-7-6	0	0	98-100	94-100	85-100	83-99	55-68	31-39
	8-27	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	94-100	82-96	71-85	57-69	33-40
	27-80	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	94-100	78-98	70-89	57-72	33-44
Dalby----------	0-5	*Silty clay loam	*CL	*A-7-6	0	0	98-100	95-100	91-100	79-100	45-65	23-37
	5-11	*Silty clay	*CH	*A-7-6	0	0	98-100	95-100	82-100	79-100	48-69	23-40
	11-33	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	95-100	77-100	67-91	51-73	26-43
	33-80	*Clay, Silty clay	*CH	*A-7-6	0	0	98-100	95-100	86-100	76-95	55-71	30-43
WAB:												
Walkerwells-----	0-9	*Stratified silty clay loam	*MH, CL	*A-7-6	0	0	100	98-100	---	---	41-55	19-25
	9-26	*Silty clay loam, Silt loam, clay loam, loam	*CL, CH, MH	*A-7-6, A-6	0	0	100	98-100	90-100	87-99	39-55	17-25
	26-50	*Silty clay, Silty clay loam	*CH, CL	*A-7-6, A-6	0	0	100	100	80-100	76-97	33-54	13-29
	50-80	*Silty clay, Silty clay loam	*CH, CL	*A-7-6	0	0	100	100	90-100	86-100	43-59	25-36

Table 20.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
YAG:												
Yarbam----------	0-6	*Very gravelly loam	*GM, GC	*A-2-7, A-2-6	0	0-12	38-54	35-52	30-49	22-37	30-54	12-19
	6-15	*Very gravelly loam, Very cobbly silty clay loam, very gravelly clay loam, very cobbly clay loam, very gravelly silty clay loam, very cobbly loam, very gravelly silt loam, very cobbly silt loam	*GM, GC	*A-2-6, A-7-6	0	7-18	35-59	32-57	28-53	20-41	30-48	11-19
	15-25	*Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-10	*Bedrock			---	---	---	---	---	---	---	---
YLA:												
Yesum----------	0-8	*Silt loam	*CL-ML,	*A-4	0	0	100	94-100	84-99	69-83	27-39	9-17
	8-21	*Gypsiferous silt loam	*SC-SM, CL-ML, CL	*A-4, A-6	0	0	100	95-100	83-100	67-86	21-37	6-18
	21-80	*Gypsiferous silt loam	*SC-SM, CL-ML, CL	*A-4, A-6	0	0	100	95-100	84-100	68-86	22-37	7-18
Loki----------	0-3	*Loam	*CL	*A-6	0	0	100	100	84-98	59-73	23-39	7-18
	3-14	*Silt loam, Loam	*ML,	*A-6, A-4	0	0	100	100	87-100	69-89	18-38	3-18
	14-80	*Gypsiferous silt loam	*CL-ML,	*A-6, A-4	0	0	100	100	83-97	71-85	22-36	7-18
Corvus----------	0-6	*Gypsiferous silt loam	*ML	*A-4,	0	0	100	100	94-100	77-87	27-41	9-17
	6-10	*Gypsiferous silt loam	*CL	*A-6,	0	0	100	100	95-100	78-86	29-38	12-18
	10-22	*Cemented material			---	---	---	---	---	---	---	---

Table 21.--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					
AAD:												
Aguena----------	0-6	2-8	1.30-1.60	2-6	0.07-0.11	0.0-2.9	0.5-1.0	.05	.05	5	2	134
	6-80	2-8	1.30-1.60	2-6	0.07-0.11	0.0-2.9	0.0-0.5	.05	.05			
ABE:												
Allamore----------	0-8	10-22	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.0	.15	.37	1	6	48
	8-19	10-24	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.0	.15	.37			
	19-29	---	---	0.00-0.2	---	---	---	---	---			
Beach----------	0-9	13-25	1.30-1.60	0.6-2	0.06-0.09	0.0-2.9	0.5-1.0	.10	.20	1	6	48
	9-19	---	---	0.00-0.2	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
ABG:												
Allamore, moist-----	0-8	13-25	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.0	.15	.37	1	6	48
	8-17	15-27	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.0	.15	.37			
	17-27	---	---	0.00-0.2	---	---	---	---	---			
Beach, moist--------	0-9	10-20	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.5	.15	.37	1	7	38
	9-19	---	---	0.00-0.2	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
ANB:												
Antbed----------	0-4	20-42	1.50-1.65	0.6-2	0.12-0.17	3.0-5.9	1.0-3.0	.32	.32	5	4	86
	4-17	27-50	1.45-1.70	0.2-0.6	0.15-0.20	3.0-5.9	1.0-2.0	.32	.32			
	17-80	28-55	1.35-1.60	0.2-0.6	0.12-0.18	3.0-5.9	0.5-1.0	.28	.28			
BBC:												
Beach----------	0-9	10-25	1.30-1.60	0.6-2	0.06-0.09	0.0-2.9	0.5-1.0	.10	.20	1	6	48
	9-19	---	---	0.00-0.2	---	---	---	---	---			
BBD:												
Beach----------	0-9	10-25	1.30-1.60	0.6-2	0.04-0.06	0.0-2.9	0.5-1.0	.10	.20	1	6	48
	9-19	---	---	0.00-0.2	---	---	---	---	---			

Table 21.--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					
BCE:												
Beach, moist--------	0-6	18-26	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.5	.15	.37	1	8	0
	6-16	---	---	0.00-0.2	---	---	---	---	---			
Allamore, moist-----	0-7	13-25	1.30-1.55	0.6-2	0.09-0.13	0.0-2.0	0.5-1.0	.15	.37	1	6	48
	7-9	15-25	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.0	.15	.37			
	9-19	---	---	0.00-0.2	---	---	---	---	---			
BCG:												
Beach----------	0-5	12-26	1.30-1.60	0.6-2	0.06-0.09	0.0-2.9	0.5-1.0	.10	.20	1	6	48
	5-15	---	---	0.00-0.2	---	---	---	---	---			
Allamore----------	0-4	10-22	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.0	.15	.37	1	6	48
	4-11	10-25	1.30-1.55	0.6-2	0.06-0.13	0.0-2.9	0.5-1.0	.15	.37			
	11-21	---	---	0.00-0.2	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
BED:												
Beach, moist--------	0-10	13-20	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.5	.15	.37	1	7	38
	10-20	---	---	0.00-0.2	---	---	---	---	---			
Tenneco, moist------	0-10	15-27	1.30-1.55	0.6-2	0.15-0.20	0.5-2.9	1.0-3.0	.37	.37	5	6	48
	10-17	25-35	1.30-1.60	0.6-2	0.15-0.20	0.5-2.9	1.0-2.0	.32	.32			
	17-80	15-35	1.30-1.55	0.6-2	0.15-0.20	0.5-2.9	0.5-1.0	.37	.37			
BHE:												
Bissett----------	0-6	18-32	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-2.0	.10	.32	1	6	48
	6-13	25-35	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-2.0	.10	.32			
	13-23	---	---	0.00-0.06	---	---	---	---	---			
Beach----------	0-11	10-25	1.30-1.50	0.6-2	0.10-0.15	0.0-2.9	0.5-1.0	.15	.37	1	7	38
	11-21	---	---	0.00-0.2	---	---	---	---	---			
BID:												
Bissett----------	0-4	18-32	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-0.9	.10	.32	1	6	48
	4-17	25-35	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-0.9	.10	.32			
	17-27	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---

Table 21.--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	18-32	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-0.9	.10	.32	1	6	48
	2-9	25-35	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-0.9	.10	.32			
	9-19	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
BIG:												
Bissett----------	0-4	18-32	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-0.9	.10	.32	1	6	48
	4-14	25-35	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-0.9	.10	.32			
	14-24	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
BRE:												
Bissett, moist------	0-5	18-32	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-0.9	.10	.32	1	6	48
	5-11	25-35	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-0.9	.10	.32			
	11-21	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
BRG:												
Bissett, moist------	0-6	18-32	1.30-1.55	2-6	0.10-0.15	0.0-2.9	0.5-0.9	.15	.37	1	6	48
	6-14	18-32	1.30-1.55	2-6	0.08-0.11	0.0-2.9	0.5-0.9	.10	.32			
	14-24	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
BSG:												
Bissett----------	0-7	18-32	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-2.0	.10	.32	1	6	48
	7-17	25-35	1.30-1.55	2-6	0.09-0.13	0.0-2.9	0.5-2.0	.10	.32			
	17-27	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
Beach----------	0-9	15-25	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.5-1.0	.15	.37	1	7	38
	9-19	---	---	0.00-0.2	---	---	---	---	---			

Table 21.--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					
BVC:												
Bofecillos----------	0-9	18-25	1.30-1.55	0.2-0.6	0.08-0.11	0.0-2.9	0.5-2.0	.10	.37	1	8	0
	9-19	---	---	0.00-0.06	---	---	---	---	---			
Leyva----------	0-6	35-40	1.30-1.60	0.6-2	0.09-0.13	0.0-2.9	0.8-1.5	.10	.32	1	8	0
	6-12	42-50	1.25-1.45	0.2-0.6	0.08-0.11	3.0-5.9	0.3-0.8	.15	.37			
	12-22	---	---	0.00-0.06	---	---	---	---	---			
BVE:												
Bofecillos----------	0-8	18-26	1.60-1.65	0.2-0.6	0.07-0.10	0.0-2.5	0.5-2.0	.10	.32	1	7	38
	8-18	---	---	0.00-0.06	---	---	---	---	---			
Leyva----------	0-10	35-40	1.30-1.60	0.6-2	0.09-0.13	0.0-2.9	0.8-1.5	.10	.32	1	8	0
	10-15	42-50	1.25-1.45	0.2-0.6	0.08-0.11	3.0-5.9	0.3-0.8	.15	.37			
	15-25	---	---	0.00-0.06	---	---	---	---	---			
Horsetrap----------	0-8	20-32	1.60-1.65	0.2-0.6	0.08-0.11	0.0-2.9	0.5-2.0	.15	.32	1	6	48
	8-14	19-32	1.60-1.65	0.2-0.6	0.08-0.11	0.0-2.9	0.5-2.0	.15	.32			
	14-24	---	---	0.00-0.06	---	---	---	---	---			
CCE:												
Changas----------	0-4	23-45	1.60-1.65	0.2-0.6	0.12-0.17	6.0-9.0	0.8-1.3	.32	.32	3	4	86
	4-80	40-60	1.35-1.60	0.00-0.06	0.12-0.18	6.0-9.0	0.0-0.8	.32	.32			
Corazones----------	0-4	15-20	1.30-1.55	2-6	0.13-0.18	0.0-2.9	0.5-1.0	.10	.32	5	6	48
	4-12	15-20	1.40-1.65	2-6	0.08-0.11	0.0-2.9	0.5-1.0	.10	.32			
	12-80	14-25	1.50-1.70	2-6	0.04-0.06	0.0-2.9	0.5-1.0	.05	.32			
CHC:												
Chilicotal----------	0-6	15-22	1.30-1.55	0.6-2	0.09-0.13	0.0-2.9	0.8-2.0	.15	.37	5	6	48
	6-80	16-29	1.30-1.55	0.6-2	0.07-0.09	0.0-2.9	0.5-1.0	.10	.37			
CIB:												
Chillon----------	0-7	12-18	1.30-1.60	2-6	0.04-0.06	0.0-2.9	0.3-0.8	.05	.24	2	8	0
	7-20	6-15	1.30-1.60	6-20	0.02-0.04	0.0-2.9	0.2-0.6	.02	.20			
	20-36	7-16	1.60-1.70	6-20	0.01-0.02	0.0-2.5	0.1-0.5	.02	.15			
	36-80	7-16	1.30-1.60	6-20	0.02-0.04	0.0-2.5	0.1-0.5	.02	.20			

Table 21.--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					
CLA:												
Chipotle----------	0-7	5-13	1.35-1.50	2-6	0.04-0.06	0.0-2.9	0.5-0.9	.05	.20	5	8	0
	7-16	3-7	1.50-1.70	2-6	0.01-0.02	0.0-2.9	0.5-0.9	.02	.15			
	16-60	5-11	1.60-1.70	2-6	0.04-0.06	0.0-2.9	0.5-0.9	.05	.20			
	60-80	5-10	1.60-1.70	2-6	0.04-0.06	0.0-2.9	0.5-0.9	.05	.20			
Riverwash----------	0-80	---	---	---	---	---	---	---	---	-	---	---
COC:												
Chispa----------	0-4	18-30	1.60-1.65	0.6-2	0.11-0.15	0.0-2.9	1.0-3.0	.24	.32	5	6	48
	4-80	20-30	1.60-1.65	0.6-2	0.08-0.12	0.0-2.9	0.5-1.0	.32	.32			
Chilicotal----------	0-6	10-17	1.30-1.60	0.6-2	0.08-0.11	0.0-2.9	0.8-2.0	.10	.37	5	6	48
	6-31	10-20	1.30-1.60	0.6-2	0.07-0.09	0.0-2.9	0.2-1.0	.05	.37			
	31-80	11-20	1.30-1.60	0.6-2	0.08-0.11	0.0-2.9	0.1-0.5	.10	.37			
CPC:												
Chispa----------	0-6	10-27	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	6-16	20-35	1.45-1.70	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.28	.32			
	16-80	20-35	1.45-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
Tenneco----------	0-6	12-25	1.30-1.55	0.6-2	0.15-0.20	0.5-2.9	1.0-3.0	.37	.37	5	5	56
	6-31	24-32	1.60-1.65	0.6-2	0.12-0.17	0.5-2.9	1.0-2.0	.32	.32			
	31-80	24-35	1.45-1.70	0.6-2	0.15-0.20	0.5-2.9	0.5-1.0	.32	.32			
CTC:												
Corvus----------	0-2	10-20	1.00-1.20	0.6-2	0.11-0.15	1.0-2.9	0.5-1.0	.37	.37	1	5	56
	2-6	10-20	1.15-1.40	0.6-2	0.11-0.15	1.0-2.9	0.1-0.5	.37	.37			
	6-9	---	1.15-1.30	0.00-0.06	---	---	---	---	---			
	9-80	10-20	1.15-1.40	0.6-2	0.11-0.15	1.0-2.9	0.1-0.2	.37	.37			
Yesum----------	0-2	10-17	1.30-1.60	0.6-2	0.11-0.15	0.0-1.0	1.0-2.0	.28	.28	1	3	86
	2-7	5-15	1.50-1.70	0.6-2	0.06-0.10	0.0-1.0	0.1-0.5	.24	.24			
	7-80	12-26	1.40-1.65	0.6-2	0.16-0.24	0.2-2.9	0.1-0.5	.37	.37			
Peligro----------	0-1	10-17	1.30-1.60	0.6-2	0.11-0.15	0.0-1.0	0.5-1.0	.24	.24	1	3	86
	1-80	0-5	1.00-1.30	0.6-2	0.02-0.05	0.0-0.4	0.1-0.3	.15	.15			

Table 21.--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					
CVC:												
Culberspeth---------	0-2	13-27	1.30-1.55	0.6-2	0.12-0.16	0.0-2.9	0.5-2.0	.24	.37	1	5	56
	2-8	14-27	1.40-1.60	0.6-2	0.12-0.16	0.0-2.9	0.5-1.0	.24	.37			
	8-18	---	---	0.00-0.06	---	---	---	---	---			
Chilicotal----------	0-3	15-27	1.30-1.55	0.6-2	0.13-0.18	0.0-2.9	1.0-4.0	.28	.37	5	4L	86
	3-12	18-28	1.30-1.55	0.6-2	0.12-0.16	0.0-2.9	1.0-3.0	.24	.37			
	12-80	18-30	1.30-1.55	0.6-2	0.07-0.09	0.0-2.9	0.0-1.0	.05	.37			
CWC:												
Culberspeth, moist--	0-7	13-27	1.40-1.65	0.6-2	0.13-0.18	0.0-2.9	0.5-2.0	.24	.37	1	5	56
	7-19	14-27	1.40-1.60	0.6-2	0.13-0.18	0.0-2.9	0.5-1.0	.28	.37			
	19-29	---	---	0.00-0.06	---	---	---	---	---			
Kahn, moist---------	0-8	13-21	1.50-1.70	0.2-0.6	0.13-0.20	0.5-2.9	0.5-1.0	.37	.37	5	3	86
	8-24	17-28	1.40-1.65	0.2-0.6	0.15-0.20	0.5-2.9	0.3-0.8	.37	.37			
	24-80	18-30	1.60-1.65	0.2-0.6	0.12-0.17	0.5-2.9	0.3-0.8	.32	.32			
DEB:												
Dellahunt----------	0-6	12-26	1.30-1.45	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	6-30	18-35	1.30-1.55	0.2-0.6	0.15-0.20	0.0-2.9	0.3-1.0	.32	.32			
	30-80	18-35	1.30-1.55	0.6-2	0.16-0.24	0.0-2.9	0.3-0.8	.37	.37			
DNB:												
Dellahunt----------	0-4	7-26	1.30-1.45	0.6-2	0.15-0.20	0.0-2.9	1.0-4.0	.32	.32	5	4L	86
	4-17	27-35	1.30-1.55	0.2-0.6	0.15-0.20	0.0-2.9	0.3-0.8	.32	.32			
	17-80	18-35	1.30-1.55	0.6-2	0.16-0.24	0.0-2.9	0.3-0.8	.49	.49			
Neimahr----------	0-5	15-30	1.30-1.50	0.6-2	0.13-0.20	0.0-2.9	1.0-3.0	.37	.37	1	4L	86
	5-17	15-35	1.45-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.5	.32	.32			
	17-27	---	---	0.00-0.06	---	---	---	---	---			
Joberanch----------	0-3	10-25	1.30-1.55	2-6	0.15-0.20	0.5-2.9	1.0-3.0	.37	.37	1	4L	86
	3-8	15-32	1.15-1.40	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.37	.37			
	8-12	15-30	1.15-1.40	0.6-2	0.12-0.16	0.0-2.9	0.3-0.8	.43	.43			
	12-80	---	---	0.03-0.3	---	---	---	---	---			
DOC:												
Double----------	0-4	10-25	1.30-1.55	0.6-2	0.13-0.17	1.5-2.0	1.2-2.0	.37	.37	5	4L	86
	4-23	21-31	1.30-1.55	0.6-2	0.13-0.20	1.8-2.5	1.0-1.8	.32	.32			
	23-80	25-35	1.30-1.60	0.6-2	0.13-0.20	2.0-3.0	0.5-0.9	.32	.32			

Table 21.--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					
ELC:												
Elcor----------	0-7	7-18	1.20-1.30	0.6-2	0.08-0.10	0.0-2.0	0.3-1.5	.37	.37	2	5	56
	7-17	---	---	0.2-0.6	---	---	---	---	---			
ELE:												
Elcor----------	0-3	10-25	1.30-1.50	0.6-2	0.15-0.20	0.0-2.0	0.5-1.0	.37	.37	2	6	48
	3-7	10-25	1.40-1.65	0.6-2	0.15-0.20	0.0-2.0	0.3-1.0	.37	.37			
	7-17	---	---	0.2-0.6	---	---	---	---	---			
EPA:												
Elcor----------	0-19	7-18	1.20-1.30	0.6-2	0.08-0.10	0.0-2.0	0.3-1.5	.37	.37	2	5	56
	19-80	---	---	0.2-0.6	---	---	---	---	---			
Dellahunt----------	0-9	15-27	1.30-1.45	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.43	.43	5	4L	86
	9-34	20-35	1.30-1.55	0.2-0.6	0.15-0.20	0.0-2.9	0.3-0.8	.43	.43			
	34-80	18-35	1.30-1.55	0.6-2	0.16-0.24	0.0-2.9	0.3-0.8	.49	.49			
Pokorny----------	0-1	10-28	1.30-1.55	0.6-2	0.13-0.18	0.0-2.9	1.0-3.0	.32	.32	1	4L	86
	1-17	15-32	1.35-1.60	0.6-2	0.13-0.18	0.0-2.9	0.1-0.8	.32	.32			
	17-80	---	---	0.06-0.2	---	---	---	---	---			
EPE:												
Elcor----------	0-7	10-25	1.20-1.30	0.6-2	0.08-0.10	0.0-2.0	0.3-1.0	.37	.37	2	6	48
	7-17	---	---	0.06-0.6	---	---	---	---	---			
Pokorny----------	0-14	15-32	1.10-1.30	0.6-2	0.13-0.18	0.0-2.9	0.1-0.8	.32	.32	1	6	48
	14-59	---	---	0.06-0.2	---	---	---	---	---			
Walkerwells---------	0-6	12-17	1.00-1.20	0.2-0.6	0.13-0.20	3.0-5.9	2.0-5.0	.28	.28	5	3	86
	6-42	25-35	1.25-1.35	0.06-0.2	0.18-0.22	3.0-5.9	1.0-2.0	.37	.37			
	42-80	30-35	1.40-1.55	0.06-0.2	0.18-0.22	3.0-5.9	0.0-0.5	.32	.32			
Hollomex----------	0-2	10-15	1.30-1.50	0.6-2	0.09-0.13	0.0-2.9	0.7-1.0	.37	.37	5	4L	86
	2-80	18-27	1.20-1.30	0.6-2	0.08-0.10	0.0-2.9	0.0-1.0	.37	.37			
GAA:												
Gypsic Aquisalids---	0-5	15-28	1.30-1.50	0.2-0.6	0.16-0.24	0.0-2.9	0.3-1.0	.37	.37	2	4L	86
	5-80	26-32	1.40-1.65	0.2-0.6	0.16-0.24	0.0-2.9	0.2-0.6	.37	.37			

Table 21.--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					
HPC:												
Hollebeke----------	0-1	5-13	1.20-1.30	0.6-2	0.08-0.10	0.0-2.0	0.3-1.5	.37	.37	1	5	56
	1-4	5-13	1.20-1.30	0.6-2	0.08-0.10	0.0-2.0	0.3-1.0	.37	.37			
	4-13	---	---	0.2-1	---	---	---	---	---			
	13-22	---	---	0.06-0.6	---	---	---	---	---			
Pokorny----------	0-2	10-20	1.25-1.40	0.6-2	0.13-0.18	0.0-2.9	1.0-3.0	.32	.32	1	4L	86
	2-19	15-32	1.10-1.30	0.6-2	0.13-0.18	0.0-2.9	0.1-0.8	.32	.32			
	19-29	---	---	0.06-0.2	---	---	---	---	---			
HRC:												
Horsetrap----------	0-9	13-24	1.30-1.60	0.2-0.6	0.06-0.09	0.0-2.9	0.5-2.0	.10	.20	1	5	56
	9-17	15-26	1.30-1.60	0.2-0.6	0.06-0.09	0.0-2.9	0.5-2.0	.10	.20			
	17-27	---	---	0.00-0.06	---	---	---	---	---			
Bofecillos----------	0-9	18-25	1.60-1.65	0.2-0.6	0.08-0.11	0.0-2.9	0.5-2.0	.10	.37	1	6	48
	9-19	---	---	0.00-0.06	---	---	---	---	---			
KPB:												
Kinco----------	0-8	8-15	1.35-1.50	2-6	0.02-0.06	0.0-2.9	1.0-2.0	.17	.17	5	3	86
	8-31	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.24	.24			
	31-80	3-15	1.60-1.70	2-6	0.06-0.10	0.0-2.9	0.0-0.5	.17	.17			
Aguena----------	0-4	2-8	1.30-1.60	2-6	0.07-0.11	0.0-2.9	0.5-1.0	.05	.05	5	2	134
	4-80	2-8	1.30-1.60	2-6	0.07-0.11	0.0-2.9	0.0-0.5	.05	.05			
Perilla----------	0-16	5-18	1.35-1.60	2-6	0.11-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	16-37	8-18	1.35-1.60	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.24	.24			
	37-80	8-18	1.35-1.60	2-6	0.11-0.16	0.0-2.9	0.0-0.5	.24	.24			
LPG:												
Lampshire----------	0-4	2-18	1.30-1.60	0.6-2	0.06-0.08	0.0-2.9	1.0-2.0	.05	.37	1	8	0
	4-14	---	---	0.00-0.06	---	---	---	---	---			
Pantak----------	0-5	15-35	1.60-1.65	0.6-2	0.06-0.09	0.0-2.9	0.8-1.5	.10	.32	1	7	38
	5-10	27-35	1.30-1.65	0.6-2	0.09-0.13	3.0-5.9	0.3-0.8	.15	.32			
	10-20	---	---	0.00-0.06	---	---	---	---	---			

Table 21.--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					
LRE:												
Lark----------	0-18	0-2	1.50-1.70	20-101	0.02-0.06	0.0-1.5	0.1-0.3	.15	.15	5	1	220
	18-80	0-2	1.50-1.70	20-101	0.02-0.06	0.0-1.5	0.1-0.3	.15	.15			
MAB:												
McAllister----------	0-8	15-27	1.30-1.60	0.6-2	0.11-0.15	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	8-20	18-35	1.60-1.65	0.6-2	0.12-0.17	0.5-5.9	0.5-1.0	.32	.32			
	20-63	18-35	1.60-1.65	0.6-2	0.12-0.17	0.5-5.9	0.3-0.8	.32	.32			
	63-80	15-27	1.50-1.70	0.6-2	0.11-0.15	0.0-2.9	0.2-0.8	.28	.28			
MCB:												
Michigan----------	0-7	35-50	1.25-1.45	0.2-0.6	0.12-0.18	3.0-8.0	1.0-2.0	.28	.28	5	4	86
	7-21	35-50	1.25-1.45	0.2-0.6	0.12-0.18	3.0-8.0	0.1-1.0	.28	.28			
	21-80	35-50	1.25-1.45	0.2-0.6	0.12-0.18	3.0-8.0	0.1-0.8	.28	.28			
MHA:												
Monahans----------	0-2	3-15	1.50-1.70	2-6	0.05-0.08	0.0-2.9	0.5-1.0	.15	.15	5	3	86
	2-6	8-15	1.50-1.70	0.6-2	0.11-0.15	0.0-2.9	0.3-0.7	.24	.24			
	6-16	10-17	1.50-1.70	0.6-2	0.11-0.15	0.0-2.9	0.2-0.6	.24	.24			
	16-80	8-15	1.50-1.70	0.6-2	0.11-0.15	0.0-2.9	0.1-0.5	.24	.24			
OCB:												
Ojinaga----------	0-3	16-25	1.30-1.55	2-6	0.12-0.16	0.0-2.9	0.5-1.0	.17	.32	5	5	56
	3-10	16-28	1.60-1.65	2-6	0.05-0.06	0.0-2.9	0.1-1.0	.05	.28			
	10-20	---	---	0.00-0.06	---	---	---	---	---			
Corazones----------	0-3	10-30	1.30-1.60	2-6	0.07-0.09	0.0-2.9	0.5-1.0	.10	.24	5	6	48
	3-11	12-25	1.50-1.70	2-6	0.05-0.07	0.0-2.9	0.5-1.0	.05	.24			
	11-80	10-25	1.50-1.70	2-6	0.04-0.06	0.0-2.9	0.5-1.0	.05	.24			
OCF:												
Ojinaga----------	0-4	16-28	1.60-1.65	2-6	0.08-0.11	0.0-2.9	0.5-1.0	.10	.28	1	6	48
	4-11	16-28	1.60-1.65	2-6	0.05-0.08	0.0-2.9	0.1-1.0	.05	.28			
	11-21	---	---	0.00-0.06	---	---	---	---	---			
Corazones----------	0-2	15-25	1.60-1.65	2-6	0.05-0.08	0.0-2.9	0.5-1.0	.05	.28	5	8	0
	2-80	15-25	1.60-1.65	2-6	0.05-0.08	0.0-2.9	0.5-1.0	.05	.28			

Table 21.--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					
PAG:												
Pantak----------	0-4	10-20	1.60-1.65	2-6	0.06-0.09	0.0-2.9	0.8-1.5	.10	.32	1	6	48
	4-8	20-35	1.30-1.65	0.6-2	0.09-0.13	3.0-5.9	0.3-0.8	.15	.32			
	8-18	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
PRA:												
Pantera----------	0-3	3-10	1.50-1.70	6-20	0.02-0.05	0.0-1.5	0.1-0.5	.05	.17	5	2	134
	3-20	2-8	1.50-1.70	6-20	0.01-0.04	0.0-1.5	0.1-0.3	.05	.17			
	20-80	2-8	1.50-1.70	6-20	0.01-0.02	0.0-1.5	0.1-0.3	.02	.17			
Riverwash----------	0-80	---	---	---	---	---	---	---	---	-	---	---
RLA:												
Reyab, moist--------	0-11	18-27	0.90-1.35	0.2-0.6	0.15-0.20	0.0-2.9	1.5-4.0	.37	.37	5	6	48
	11-44	18-35	1.15-1.25	0.2-0.6	0.15-0.22	3.0-5.9	1.0-2.0	.32	.32			
	44-80	18-35	1.15-1.40	0.2-0.6	0.16-0.24	0.0-2.9	0.3-1.0	.37	.37			
RSA:												
Reyab----------	0-3	8-23	0.90-1.35	0.2-0.6	0.14-0.16	1.0-2.9	1.5-4.0	.43	.43	5	5	56
	3-31	26-35	1.15-1.25	0.2-0.6	0.15-0.17	2.5-4.0	1.0-2.5	.64	.64			
	31-80	26-35	1.15-1.40	0.2-0.6	0.15-0.17	2.5-4.0	0.3-0.9	.64	.64			
RXG:												
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
Lampshire----------	0-4	10-15	1.30-1.60	0.6-2	0.06-0.09	0.0-2.9	1.0-2.0	.10	.24	1	6	48
	4-14	---	---	0.00-0.01	---	---	---	---	---			
STB:												
Stovall----------	0-12	22-35	1.35-1.50	0.6-2	0.12-0.16	3.0-5.9	0.5-2.0	.32	.32	5	4L	86
	12-23	22-35	1.35-1.50	0.6-2	0.10-0.16	3.0-5.9	0.5-1.0	.32	.32			
	23-80	10-25	1.35-1.50	0.6-2	0.10-0.16	3.0-5.9	0.2-1.0	.32	.32			
TEC:												
Tenneco, moist------	0-7	15-27	1.30-1.50	0.6-2	0.16-0.24	0.5-2.9	1.0-3.0	.37	.37	5	5	56
	7-42	24-27	1.30-1.50	0.6-2	0.16-0.24	0.5-2.9	1.0-2.0	.37	.37			
	42-61	18-27	1.30-1.55	0.6-2	0.15-0.20	0.5-2.9	0.5-1.0	.37	.37			
	61-80	18-27	1.30-1.55	0.6-2	0.15-0.20	0.5-2.9	0.5-1.0	.37	.37			

Table 21.--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					
VDA:												
Verhalen----------	0-8	42-53	1.30-1.60	0.00-0.06	0.12-0.17	9.0-11.9	1.0-2.0	.28	.28	5	4	86
	8-27	45-54	1.30-1.60	0.00-0.06	0.12-0.17	9.0-11.9	0.5-2.0	.28	.28			
	27-80	45-60	1.30-1.60	0.00-0.06	0.12-0.17	9.0-11.9	0.5-1.0	.28	.28			
Dalby----------	0-5	33-50	1.30-1.60	0.06-0.2	0.18-0.22	6.0-11.9	1.0-2.0	.37	.37	5	4	86
	5-11	35-55	1.35-1.60	0.00-0.06	0.12-0.18	9.0-11.9	1.0-2.0	.37	.37			
	11-33	40-60	1.35-1.60	0.00-0.06	0.11-0.16	9.0-11.9	1.0-2.0	.37	.37			
	33-80	45-60	1.35-1.60	0.00-0.06	0.09-0.14	9.0-11.9	0.5-1.0	.37	.37			
WAB:												
Walkerwells---------	0-9	27-35	1.00-1.20	0.2-0.6	0.18-0.22	3.0-5.9	2.0-5.0	.28	.28	5	4L	86
	9-26	25-35	1.10-1.30	0.2-0.6	0.18-0.22	3.0-5.9	2.0-5.0	.28	.28			
	26-50	20-41	1.25-1.45	0.06-0.2	0.12-0.18	3.0-5.9	1.0-2.0	.37	.37			
	50-80	35-50	1.40-1.55	0.06-0.2	0.12-0.18	3.0-5.9	0.0-0.5	.32	.32			
YAG:												
Yarbam----------	0-6	20-28	1.30-1.55	2-6	0.08-0.11	0.0-2.9	1.0-8.0	.15	.43	1	6	48
	6-15	20-28	1.30-1.55	2-6	0.08-0.11	0.0-2.9	1.0-5.0	.15	.37			
	15-25	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-10	---	---	0.00-0.01	---	---	---	---	---	-	---	---
YLA:												
Yesum----------	0-8	15-25	1.30-1.50	0.6-2	0.16-0.24	0.5-2.9	1.0-2.0	.37	.37	3	6	48
	8-21	10-26	1.40-1.65	0.6-2	0.16-0.24	0.5-2.9	0.1-0.5	.37	.37			
	21-80	12-26	1.40-1.65	0.6-2	0.16-0.24	0.2-2.9	0.1-0.5	.37	.37			
Loki----------	0-3	12-26	1.30-1.55	0.6-2	0.15-0.20	1.0-5.9	0.4-0.6	.37	.37	3	4L	86
	3-14	6-26	1.40-1.65	0.6-2	0.16-0.24	1.0-5.9	0.1-0.5	.37	.37			
	14-80	12-26	1.40-1.65	0.6-2	0.16-0.24	0.0-2.9	0.1-0.2	.37	.37			
Corvus----------	0-6	15-25	1.00-1.20	0.6-2	0.11-0.15	1.0-2.9	1.0-3.0	.37	.37	2	6	48
	6-10	18-26	1.15-1.40	0.6-2	0.11-0.15	1.0-2.9	0.5-1.0	.37	.37			
	10-22	---	1.15-1.30	0.00-0.06	---	---	---	---	---			

Table 22.--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	
AAD:							
Aguena	0-6	1.8-6.4	7.4-8.4	0-5	0	0.0-2.0	0
	6-80	1.4-6.1	7.4-8.4	0-5	0	0.0-2.0	0
ABE:							
Allamore	0-8	8.6-17	7.4-8.4	5-15	0	0.0-2.0	0
	8-19	7.9-17	7.4-8.4	15-30	0	0.0-2.0	0
	19-29	---	---	---	---	---	---
Beach	0-9	11-20	6.6-8.4	0-5	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
Rock outcrop	0-10	---	---	---	---	---	---
ABG:							
Allamore, moist	0-8	11-19	7.4-8.4	5-15	0	0.0-2.0	0
	8-17	12-19	7.4-8.4	15-30	0	0.0-2.0	0
	17-27	---	---	---	---	---	---
Beach, moist	0-9	8.6-17	6.6-7.9	0-5	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
Rock outcrop	0-10	---	---	---	---	---	---
ANB:							
Antbed	0-4	17-34	6.6-7.8	0-5	0	0.0-2.0	0
	4-17	22-39	7.4-8.4	0-5	0	0.0-2.0	0-2
	17-80	22-41	7.9-8.4	5-15	0	0.0-2.0	0-2
BBC:							
Beach	0-9	8.6-20	6.6-8.4	0-5	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
BBD:							
Beach	0-9	8.6-20	6.6-8.4	0-5	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
BCE:							
Beach, moist	0-6	15-21	7.4-7.9	0-5	0	0.0-2.0	0
	6-16	---	---	---	---	---	---
Allamore, moist	0-7	11-19	7.9-8.4	5-15	0	0.0-2.0	0
	7-9	12-17	7.9-8.4	15-30	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
BCG:							
Beach	0-5	10-21	6.6-8.4	0-5	0	0.0-2.0	0
	5-15	---	---	---	---	---	---
Allamore	0-4	8.6-17	7.4-8.4	5-15	0	0.0-2.0	0
	4-11	7.9-17	7.4-8.4	15-30	0	0.0-2.0	0
	11-21	---	---	---	---	---	---
Rock outcrop	0-10	---	---	---	---	---	---

Table 22.--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	
BED:							
Beach, moist---------	0-10	11-17	6.6-7.9	0-5	0	0.0-2.0	0
	10-20	---	---	---	---	---	---
Tenneco, moist-------	0-10	13-23	7.9-8.4	0-3	0	0.0-2.0	0
	10-17	20-28	7.9-8.4	1-5	0	0.0-2.0	0
	17-80	13-28	7.9-8.4	3-10	0	0.0-2.0	0
BHE:							
Bissett----------	0-6	11-25	7.4-8.4	15-30	0	0.0-2.0	0
	6-13	15-27	7.4-8.4	40-60	0	0.0-2.0	0
	13-23	---	---	---	---	---	---
Beach----------	0-11	8.6-20	6.6-8.4	0-5	0	0.0-2.0	0
	11-21	---	---	---	---	---	---
BID:							
Bissett----------	0-4	11-15	7.4-8.4	15-30	0	0.0-2.0	0
	4-17	15-22	7.4-8.4	40-60	0	0.0-2.0	0
	17-27	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BIE:							
Bissett----------	0-2	11-21	7.4-8.4	15-30	0	0.0-2.0	0
	2-9	15-22	7.4-8.4	40-60	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BIG:							
Bissett----------	0-4	11-21	7.4-8.4	15-30	0	0.0-2.0	0
	4-14	15-22	7.4-8.4	40-60	0	0.0-2.0	0
	14-24	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BRE:							
Bissett, moist-------	0-5	11-21	7.4-8.4	15-30	0	0.0-2.0	0
	5-11	15-22	7.4-8.4	40-60	0	0.0-2.0	0
	11-21	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BRG:							
Bissett, moist-------	0-6	11-21	7.4-8.4	15-30	0	0.0-2.0	0
	6-14	11-21	7.4-8.4	40-60	0	0.0-2.0	0
	14-24	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
BSG:							
Bissett----------	0-7	11-25	7.4-8.4	15-30	0	0.0-2.0	0
	7-17	15-27	7.4-8.4	40-60	0	0.0-2.0	0
	17-27	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---

Table 22.--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	
Beach----------	0-9	13-20	6.6-8.4	0-5	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
BVC:							
Bofecillos----------	0-9	15-21	6.6-8.4	0-2	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
Leyva----------	0-6	27-32	6.5-7.4	0-2	0	0.0-1.0	0
	6-12	31-38	6.7-7.4	0-5	0	0.0-1.0	0
	12-22	---	---	---	---	---	---
BVE:							
Bofecillos----------	0-8	15-22	6.6-8.4	0-2	0	0.0-2.0	0
	8-18	---	---	---	---	---	---
Leyva----------	0-10	27-32	6.5-7.4	0-2	0	0.0-1.0	0
	10-15	31-38	6.7-7.4	0-5	0	0.0-1.0	0
	15-25	---	---	---	---	---	---
Horsetrap----------	0-8	16-26	7.4-8.4	5-15	0	0.0-2.0	0
	8-14	15-26	7.4-8.4	5-15	0	0.0-2.0	0
	14-24	---	---	---	---	---	---
CCE:							
Changas----------	0-4	19-34	7.3-8.2	1-5	1-5	0.0-2.0	0-10
	4-80	20-37	7.0-8.2	1-15	2-15	4.0-8.0	5-25
Corazones----------	0-4	13-15	7.9-8.4	5-15	0	0.0-2.0	0
	4-12	12-14	7.9-8.4	15-30	0	0.0-2.0	0-2
	12-80	11-18	7.9-8.4	15-30	0	0.0-2.0	0-3
CHC:							
Chilicotal----------	0-6	13-17	7.9-8.4	5-25	0	0.0-2.0	0
	6-80	12-18	7.9-8.4	20-35	0	0.0-2.0	0
CIB:							
Chillon----------	0-7	9.9-15	7.2-8.4	0-5	0	0.0-2.0	0-1
	7-20	5.3-9.5	7.4-8.4	5-15	0	0.0-2.0	0-1
	20-36	5.9-13	7.4-8.4	5-15	0	0.0-2.0	0-1
	36-80	5.9-13	7.4-8.4	5-15	0	0.0-2.0	0-1
CLA:							
Chipotle----------	0-7	4.0-9.7	6.1-6.5	0-1	0	0.0-2.0	0
	7-16	2.6-5.7	6.1-6.5	0-1	0	0.0-2.0	0
	16-60	4.0-8.4	6.6-7.3	0-1	0	0.0-2.0	0
	60-80	4.0-7.7	6.6-7.3	0-1	0	0.0-2.0	0
Riverwash----------	0-80	---	---	---	---	---	---
COC:							
Chispa----------	0-4	15-23	7.9-8.4	2-5	0	0.0-2.0	0
	4-80	15-20	7.9-8.4	15-35	0	0.0-8.0	0
Chilicotal----------	0-6	8.8-15	7.9-8.4	5-25	0	0.0-2.0	0
	6-31	8.3-17	7.9-8.4	20-35	0	0.0-2.0	0
	31-80	8.9-16	7.9-9.0	20-35	0	0.0-2.0	0

Table 22.--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	
CPC:							
Chispa	0-6	8.9-20	7.9-8.4	2-5	0	0.0-2.0	0
	6-16	16-26	7.9-8.4	2-10	0	0.0-4.0	0-1
	16-80	14-21	7.9-8.4	15-35	0	0.0-8.0	0-1
Tenneco	0-6	11-21	7.4-8.4	0-3	0	0.0-2.0	0
	6-31	20-26	7.9-8.4	1-5	0	0.0-2.0	0
	31-80	19-28	7.9-8.4	3-10	0	0.0-2.0	0
CTC:							
Corvus	0-2	1.7-3.5	7.4-7.8	0-2	70-90	2.0-4.0	0-2
	2-6	1.7-3.5	7.4-7.8	1-5	70-90	2.0-4.0	1-5
	6-9	---	---	1-7	60-90	5.0-15.0	10-15
	9-80	1.7-3.5	7.4-7.8	1-5	70-90	2.0-4.0	1-5
Yesum	0-2	7.6-13	7.4-8.4	0-5	1-10	1.0-4.0	0-2
	2-7	3.8-9.6	7.6-8.4	1-10	10-20	1.0-4.0	0-2
	7-80	5.4-10	7.4-8.0	5-15	50-80	2.0-4.0	0-4
Peligro	0-1	5.7-13	7.4-8.4	1-10	1-10	1.0-4.0	0-2
	1-80	1.7-3.5	7.9-8.4	1-7	70-90	2.0-4.0	0-2
CVC:							
Culberspeth	0-2	10-19	7.9-9.0	5-15	0	0.0-2.0	0
	2-8	10-17	7.9-9.0	15-35	0-2	0.0-2.0	0
	8-18	---	---	---	---	---	---
Chilicotal	0-3	12-19	7.9-8.4	5-25	0	0.0-2.0	0
	3-12	14-20	7.9-8.4	5-25	0	0.0-2.0	0
	12-80	12-19	7.9-8.4	20-35	0	0.0-2.0	0
CWC:							
Culberspeth, moist	0-7	9.8-19	7.9-9.0	5-15	0	0.0-2.0	0
	7-19	10-17	7.9-9.0	15-35	0-2	0.0-2.0	0
	19-29	---	---	---	---	---	---
Kahn, moist	0-8	10-15	7.4-7.8	3-15	0	0.0-2.0	0
	8-24	13-19	7.9-8.4	15-30	0-1	0.0-2.0	0
	24-80	14-20	7.9-8.4	15-30	0	0.0-2.0	0
DEB:							
Dellahunt	0-6	11-22	7.9-8.4	5-10	0	0.0-2.0	0
	6-30	14-28	7.9-8.5	25-35	0	0.5-2.0	0
	30-80	5.9-16	7.9-8.4	20-30	2-10	1.0-4.0	0-2
DNB:							
Dellahunt	0-4	6.4-22	7.9-9.0	5-15	0	0.5-2.0	0-1
	4-17	20-27	7.9-9.0	25-35	0	0.5-2.0	0
	17-80	6.2-16	7.9-9.0	20-30	2-10	2.0-5.0	0-2
Neimahr	0-5	12-25	6.6-7.8	15-30	0-1	0.5-2.0	0
	5-17	13-28	6.6-7.8	15-40	1-3	2.0-4.0	0-2
	17-27	---	---	---	---	---	---
Joberanch	0-3	8.9-21	7.9-8.4	5-40	0-1	0.0-1.0	0
	3-8	13-27	7.9-8.4	5-40	0-1	0.0-2.0	0
	8-12	12-24	7.9-8.4	10-40	0-2	2.0-3.0	0-2
	12-80	---	---	---	34-70	---	---

Table 22.--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	
DOC:							
Double----------	0-4	8.9-21	7.9-8.4	0-10	0	0.0-2.0	0
	4-23	17-25	7.9-8.4	3-15	0	0.0-2.0	0
	23-80	20-27	7.9-8.4	5-18	0	0.0-2.0	0-2
ELC:							
Elcor----------	0-7	1.7-4.5	7.4-8.4	0-7	60-90	2.0-4.0	0-2
	7-17	---	---	---	---	---	---
ELE:							
Elcor----------	0-3	4.5-10	7.4-8.4	5-10	60-90	2.0-4.0	0-2
	3-7	1.7-4.5	7.4-8.4	0-7	60-90	2.0-4.0	0-2
	7-17	---	---	---	---	---	---
EPA:							
Elcor----------	0-19	1.7-4.5	7.4-8.4	0-7	60-90	2.0-4.0	0-2
	19-80	---	---	---	---	---	---
Dellahunt----------	0-9	11-23	7.9-8.4	5-15	0	0.0-2.0	0
	9-34	14-27	7.9-8.4	25-35	0	0.5-4.0	0-1
	34-80	6.2-16	7.9-8.4	20-30	2-10	2.0-5.0	0-2
Pokorny----------	0-1	8.3-21	7.4-8.4	10-20	0-10	2.0-4.0	0-2
	1-17	1.2-2.6	7.4-8.4	1-5	80-95	2.0-4.0	0-2
	17-80	---	---	---	70-95	---	---
EPE:							
Elcor----------	0-7	1.7-4.5	7.4-8.4	0-7	60-90	2.0-4.0	0-2
	7-17	---	---	---	---	---	---
Pokorny----------	0-14	1.2-2.6	7.4-8.4	1-5	80-95	2.0-4.0	0-2
	14-59	---	---	---	70-95	---	---
Walkerwells----------	0-6	11-15	7.9-8.4	15-25	0	0.0-2.0	0
	6-42	19-24	7.9-8.4	20-30	1-5	0.0-4.0	0
	42-80	4.9-11	8.4-9.0	20-30	20-40	4.0-8.0	2-6
Hollomex----------	0-2	7.1-11	7.4-8.4	0-7	3-10	2.0-4.0	0-2
	2-80	2.8-6.3	7.4-8.4	5-10	40-80	2.0-4.0	3-6
GAA:							
Gypsic Aquisalids----	0-5	3.5-6.3	7.9-8.4	1-25	40-70	32.0-99.0	75-120
	5-80	3.5-6.3	7.9-8.4	1-15	40-70	32.0-99.0	50-120
HPC:							
Hollebeke----------	0-1	4.4-11	7.4-9.0	0-7	0-2	2.0-4.0	0-2
	1-4	0.7-2.6	7.4-9.0	0-7	80-100	2.0-4.0	0-2
	4-13	---	---	---	---	---	---
	13-22	---	---	---	---	---	---
Pokorny----------	0-2	2.6-10	7.4-8.4	10-20	80-95	2.0-4.0	0-2
	2-19	1.2-2.6	7.4-8.4	1-5	80-95	2.0-4.0	0-2
	19-29	---	---	---	70-95	---	---
HRC:							
Horsetrap----------	0-9	11-20	7.4-8.4	5-15	0	0.0-2.0	0
	9-17	13-22	7.4-8.4	5-35	0	0.0-2.0	0
	17-27	---	---	---	---	---	---

Table 22.--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	
Bofecillos----------	0-9	15-21	6.6-8.4	0-2	0	0.0-2.0	0
	9-19	---	---	---	---	---	---
KPB:							
Kinco----------	0-8	7.3-13	7.9-8.4	0-5	0	0.0-2.0	0
	8-31	7.6-15	7.9-8.4	0-5	0	0.0-2.0	0
	31-80	2.6-13	7.9-8.4	5-15	0	0.0-2.0	0
Aguena----------	0-4	1.8-6.4	7.4-8.4	0-5	0	0.0-2.0	0
	4-80	1.4-6.1	7.4-8.4	0-5	0	0.0-2.0	0
Perilla----------	0-16	4.8-16	7.4-7.8	2-10	0	0.0-2.0	0-1
	16-37	6.2-15	7.4-7.8	2-10	0	0.0-2.0	0-1
	37-80	6.2-15	7.4-8.4	2-10	0	0.0-2.0	0-4
LPG:							
Lampshire----------	0-4	2.1-16	6.8-8.2	0-2	0	0.0-2.0	0
	4-14	---	---	---	---	---	---
Pantak----------	0-5	13-28	6.5-7.4	0-2	0	0.0-1.0	0
	5-10	21-27	6.7-7.4	0-5	0	0.0-1.0	0
	10-20	---	---	---	---	---	---
LRE:							
Lark----------	0-18	0.9-4.5	7.0-7.6	0-4	60-98	2.0-8.0	0-8
	18-80	0.9-4.5	7.0-7.6	0-4	60-98	2.0-8.0	0-8
MAB:							
McAllister----------	0-8	13-22	7.4-8.4	0-3	0	0.0-2.0	0-1
	8-20	15-28	7.4-8.4	1-5	0	0.0-2.0	0-1
	20-63	14-27	7.4-8.4	15-30	0	0.0-2.0	0-1
	63-80	12-22	7.4-8.4	15-30	0	0.0-2.0	0-1
MCB:							
Michigan ----------	0-7	28-38	7.4-8.4	0-5	0	0.0-4.0	0
	7-21	25-37	7.4-8.4	0-8	0	0.0-4.0	0
	21-80	25-36	7.9-8.4	5-15	0	0.0-4.0	0
MHA:							
Monahans----------	0-2	2.9-13	7.4-8.4	2-20	0-2	0.0-2.0	0-2
	2-6	6.9-13	7.4-8.4	5-15	0-5	0.0-4.0	0-4
	6-16	1.9-7.3	7.4-8.4	15-40	15-30	0.0-4.0	0-10
	16-80	2.6-8.0	7.4-8.4	5-15	15-30	0.0-8.0	0-10
OCB:							
Ojinaga----------	0-3	13-17	7.9-8.2	2-15	0	0.0-2.0	0-2
	3-10	11-19	7.9-8.4	5-40	0	0.0-2.0	0-2
	10-20	---	---	---	---	---	---
Corazones----------	0-3	8.6-23	7.9-8.4	5-15	0	0.0-2.0	0
	3-11	9.4-18	7.9-8.4	15-30	0	0.0-2.0	0-2
	11-80	7.9-18	7.9-8.4	15-30	0	0.0-4.0	0-8
OCF:							
Ojinaga----------	0-4	13-20	7.9-8.2	2-15	0	0.0-2.0	0-2
	4-11	10-19	7.9-8.4	5-40	0	0.0-2.0	0-2
	11-21	---	---	---	---	---	---

Table 22.--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	
Corazones----------	0-2	13-19	7.9-8.4	5-15	0	0.0-2.0	0
	2-80	12-18	7.9-8.4	15-30	0	0.0-2.0	0-2
PAG:							
Pantak----------	0-4	8.8-17	6.5-7.4	0-2	0	0.0-1.0	0
	4-8	16-27	6.7-7.4	0-5	0	0.0-1.0	0
	8-18	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
PRA:							
Pantera----------	0-3	2.3-7.1	8.0-8.4	2-5	0	0.0-2.0	0
	3-20	1.6-5.6	8.0-8.4	4-10	0	0.0-3.0	0
	20-80	1.6-5.6	8.0-8.4	4-10	0	0.0-3.0	0
Riverwash----------	0-80	---	---	---	---	---	---
RLA:							
Reyab, moist---------	0-11	15-23	7.4-8.4	0-3	0	0.0-1.0	0-1
	11-44	15-28	7.4-8.4	0-5	0	0.0-2.0	0-1
	44-80	14-28	7.9-8.4	2-10	0	0.0-2.0	0-5
RSA:							
Reyab----------	0-3	7.4-20	7.9-8.4	0-3	0	0.0-1.0	0
	3-31	21-29	7.9-8.4	1-5	0	0.0-2.0	0
	31-80	20-27	7.9-8.4	5-14	0	0.0-2.0	0-5
RXG:							
Rock outcrop---------	0-10	---	---	---	---	---	---
Lampshire----------	0-4	8.9-13	6.1-7.8	0	0	0.0-2.0	0
	4-14	---	---	---	---	---	---
STB:							
Stovall----------	0-12	14-19	7.4-8.4	15-25	0	0.0-2.0	0
	12-23	14-21	7.4-8.4	15-30	0	0.0-2.0	0-1
	23-80	4.5-8.9	7.4-8.4	20-35	0	0.0-2.0	0-1
TEC:							
Tenneco, moist-------	0-7	13-23	7.4-8.4	0-3	0	0.0-2.0	0
	7-42	20-22	7.9-8.4	3-10	0	0.0-2.0	0
	42-61	15-22	7.9-8.4	3-10	0	0.0-2.0	0
	61-80	15-22	7.9-8.4	15-30	0	0.0-2.0	0
VDA:							
Verhalen----------	0-8	31-39	7.2-8.0	0-3	0	0.0-3.0	0
	8-27	33-40	7.5-8.1	5-20	0-5	0.0-4.0	0-2
	27-80	12-35	7.9-8.4	5-35	0-10	0.0-4.0	0-2
Dalby----------	0-5	26-36	7.4-8.4	0-10	0	0.0-3.0	0-4
	5-11	26-37	7.9-8.4	2-10	0	0.0-3.0	0-4
	11-33	29-39	7.9-8.4	2-10	0-2	0.0-3.0	0-5
	33-80	17-35	7.9-8.4	5-20	0-10	0.0-3.0	0-5

Table 22.--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	
WAB:							
Walkerwells----------	0-9	22-29	7.9-8.4	15-25	0	0.0-2.0	0
	9-26	21-29	7.9-8.4	15-25	0	0.0-2.0	0
	26-50	17-33	7.9-9.0	15-30	1-5	0.0-4.0	0
	50-80	5.1-24	7.9-9.0	15-35	1-40	4.0-8.0	2-6
YAG:							
Yarbam----------	0-6	17-22	7.6-8.4	5-10	0	0.0-2.0	0
	6-15	17-20	7.9-8.4	5-15	0	0.0-2.0	0
	15-25	---	---	---	---	---	---
Rock outcrop---------	0-10	---	---	---	---	---	---
YLA:							
Yesum----------	0-8	12-18	7.4-7.8	0-2	2-8	2.0-4.0	0-2
	8-21	3.5-10	7.4-8.0	1-5	70-90	2.0-4.0	0-4
	21-80	5.4-10	7.4-8.0	5-15	50-80	2.0-4.0	0-4
Loki----------	0-3	10-21	7.8-8.4	0-5	0-5	1.0-4.0	0-4
	3-14	3.0-16	7.8-8.4	5-15	5-15	2.0-5.0	0-4
	14-80	2.6-6.3	7.8-8.4	10-20	40-80	2.0-5.0	0-4
Corvus----------	0-6	1.7-3.5	7.4-7.8	0-2	70-90	2.0-4.0	0-2
	6-10	1.7-3.5	7.4-7.8	1-5	70-90	2.0-4.0	1-5
	10-22	---	---	1-7	60-90	5.0-15.0	10-15

Table 23.--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		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
AAD:										
Aguena	A	Very low	Jan-Dec	---	---	---	---	None	---	None
ABE:										
Allamore	D	High	Jan-Dec	---	---	---	---	None	---	None
Beach	D	High	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
ABG:										
Allamore, moist	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Beach, moist	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
ANB:										
Antbed	C	Low	Jan-Dec	---	---	---	---	None	---	None
BBC:										
Beach	D	High	Jan-Dec	---	---	---	---	None	---	None
BBD:										
Beach	D	High	Jan-Dec	---	---	---	---	None	---	None
BCE:										
Beach, moist	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Allamore, moist	D	High	Jan-Dec	---	---	---	---	None	---	None
BCG:										
Beach	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Allamore	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
BED:										
Beach, moist	D	High	Jan-Dec	---	---	---	---	None	---	None
Tenneco, moist	B	Medium	Jan-Dec	---	---	---	---	None	---	None

Table 23.--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				
BHE:										
Bissett	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Beach	D	Very high	Jan-Dec	---	---	---	---	None	---	None
BID:										
Bissett	D	High	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
BIE:										
Bissett	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
BIG:										
Bissett	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
BRE:										
Bissett, moist	D	High	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
BRG:										
Bissett, moist	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
BSG:										
Bissett	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
Beach	D	High	Jan-Dec	---	---	---	---	None	---	None
BVC:										
Bofecillos	D	High	Jan-Dec	---	---	---	---	None	---	None
Leyva	D	High	Jan-Dec	---	---	---	---	None	---	None
BVE:										
Bofecillos	D	High	Jan-Dec	---	---	---	---	None	---	None
Leyva	D	High	Jan-Dec	---	---	---	---	None	---	None
Horsetrap	D	Very high	Jan-Dec	---	---	---	---	None	---	None

Table 23.--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				
CCE:										
Changas	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Corazones	A	Very low	Jan-Dec	---	---	---	---	None	---	None
CHC:										
Chilicotal	B	Low	Jan-Dec	---	---	---	---	None	---	None
CIB:										
Chillon	A	Very low	Jan-Dec	---	---	---	---	None	---	None
CLA:										
Chipotle	A	Very low	Jun-Sep	---	---	---	---	None	Very brief	Frequent
Riverwash	---	Negligible	Jun-Sep	---	---	---	---	None	Very brief	Frequent
COC:										
Chispa	B	Low	Jan-Dec	---	---	---	---	None	---	None
Chilicotal	B	Medium	Jan-Dec	---	---	---	---	None	---	None
CPC:										
Chispa	B	Low	Jan-Dec	---	---	---	---	None	---	None
Tenneco	B	Medium	Jan-Dec	---	---	---	---	None	---	None
CTC:										
Corvus	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Yesum	B	Medium	Jan-Dec	---	---	---	---	None	---	None
Peligro	B	Low	Jan-Dec	---	---	---	---	None	---	None
CVC:										
Culberspeth	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Chilicotal	B	Medium	Jan-Dec	---	---	---	---	None	---	None
CWC:										
Culberspeth, moist	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Kahn, moist	C	Medium	Jan-Dec	---	---	---	---	None	---	None
DEB:										
Dellahunt	C	Low	Jun-Sep	---	---	---	---	None	Very brief	Occasional

Table 23.--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				
DNB:										
Dellahunt	C	Low	Jan-Dec	---	---	---	---	None	---	None
Neimahr	D	Low	Jan-Dec	---	---	---	---	None	---	None
Joberanch	D	Low	Jan-Dec	---	---	---	---	None	---	None
DOC:										
Double	B	Medium	Jan-Dec	---	---	---	---	None	---	None
ELC:										
Elcor	D	Medium	Jan-Dec	---	---	---	---	None	---	None
ELE:										
Elcor	D	Medium	Jan-Dec	---	---	---	---	None	---	None
EPA:										
Elcor	D	Low	Jan-Dec	---	---	---	---	None	---	None
Dellahunt	C	Low	Jan-Dec	---	---	---	---	None	---	None
Pokorny	D	Low	Jan-Dec	---	---	---	---	None	---	None
EPE:										
Elcor	D	High	Jan-Dec	---	---	---	---	None	---	None
Pokorny	D	Low	Jan-Dec	---	---	---	---	None	---	None
Walkerwells	C	Medium	Jun-Sep	---	---	---	---	None	Very brief	Occasional
Hollomex	B	Medium	Jan-Dec	---	---	---	---	None	---	None
GAA:										
Gypsic Aquisalids	C	Negligible	Jan-Apr	2.0-4.0	>6.0	---	---	None	---	---
			Jun-Sep	---	---	---	---	None	Brief	Occasional
			Oct-Dec	2.0-4.0	>6.0	---	---	None	---	---
HPC:										
Hollebeke	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Pokorny	D	Medium	Jan-Dec	---	---	---	---	None	---	None
HRC:										
Horsetrap	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Bofecillos	D	High	Jan-Dec	---	---	---	---	None	---	None

Table 23.--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				
KPB:										
Kinco	A	Very low	Jan-Dec	---	---	---	---	None	---	None
Aguena	A	Very low	Jan-Dec	---	---	---	---	None	---	None
Perilla	A	Very low	Jan-Dec	---	---	---	---	None	---	None
LPG:										
Lampshire	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Pantak	D	High	Jan-Dec	---	---	---	---	None	---	None
LRE:										
Lark	A	Low	Jan-Dec	3.3-5.0	5.0-5.0	---	---	None	---	None
MAB:										
McAllister	B	Low	Jan-Dec	---	---	---	---	None	---	None
MCB:										
Michigan	C	Low	Jan-Dec	---	---	---	---	None	---	None
MHA:										
Monahans	B	Very low	Jan-Dec	---	---	---	---	None	---	None
OCB:										
Ojinaga	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Corazones	A	Very low	Jan-Dec	---	---	---	---	None	---	None
OCF:										
Ojinaga	D	Medium	Jan-Dec	---	---	---	---	None	---	None
Corazones	A	Medium	Jan-Dec	---	---	---	---	None	---	None
PAG:										
Pantak	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
PRA:										
Pantera	A	Very low	Jun-Sep	---	---	---	---	None	Very brief	Frequent
Riverwash	---	Negligible	Jun-Sep	---	---	---	---	None	Very brief	Frequent
RLA:										
Reyab, moist	C	Negligible	Jun-Sep	---	---	---	---	None	Very brief	Occasional

Table 23.--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				
RSA:										
Reyab	C	Low	Jun-Sep	---	---	---	---	None	Very brief	Occasional
RXG:										
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
Lampshire	D	Very high	Jan-Dec	---	---	---	---	None	---	None
STB:										
Stovall	B	Low	Jan-Dec	---	---	---	---	None	---	None
TEC:										
Tenneco, moist	B	Medium	Jan-Dec	---	---	---	---	None	---	None
VDA:										
Verhalen	D	Low	Jun-Sep	---	---	---	---	None	---	Rare
Dalby	D	Low	Jun-Sep	---	---	---	---	None	---	Rare
WAB:										
Walkerwells	C	Low	Jun-Sep	---	---	---	---	None	Very brief	Occasional
YAG:										
Yarbam	D	Very high	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	---	Very high	Jan-Dec	---	---	---	---	None	---	None
YLA:										
Yesum	B	Negligible	Jan-Dec	---	---	---	---	None	---	None
Loki	B	Negligible	Jan-Dec	---	---	---	---	None	---	None
Corvus	D	Low	Jan-Dec	---	---	---	---	None	---	None

Table 24.--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			
AAD:						
Aguena	---	---	---	---	Moderate	Low
ABE:						
Allamore	Lithic bedrock	4-20	---	Indurated	Moderate	Low
Beach	Lithic bedrock	4-12	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
ABG:						
Allamore, moist	Lithic bedrock	7-20	---	Indurated	Moderate	Low
Beach, moist	Lithic bedrock	3-19	---	Strongly cemented	Moderate	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
ANB:						
Antbed	---	---	---	---	High	Low
BBC:						
Beach	Lithic bedrock	4-13	---	Strongly cemented	Moderate	Low
BBD:						
Beach	Lithic bedrock	3-14	---	Indurated	Moderate	Low
BCE:						
Beach, moist	Lithic bedrock	4-13	---	Strongly cemented	Moderate	Low
Allamore, moist	Lithic bedrock	8-20	---	Indurated	Moderate	Low
BCG:						
Beach	Lithic bedrock	4-12	---	Indurated	Moderate	Low
Allamore	Lithic bedrock	4-20	---	Indurated	Low	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
BED:						
Beach, moist	Lithic bedrock	3-19	---	Indurated	Moderate	Low
Tenneco, moist	---	---	---	---	Moderate	Low
BHE:						
Bissett	Lithic bedrock	7-20	---	Indurated	Low	Low
Beach	Lithic bedrock	3-14	---	Indurated	Moderate	Low
BID:						
Bissett	Lithic bedrock	7-20	---	Indurated	Low	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
BIE:						
Bissett	Lithic bedrock	7-20	---	Indurated	Low	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
BIG:						
Bissett	Lithic bedrock	7-20	---	Indurated	Low	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
BRE:						
Bissett, moist	Lithic bedrock	7-20	---	Indurated	Low	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
BRG:						
Bissett, moist	Lithic bedrock	7-20	---	Indurated	Low	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
BSG:						
Bissett	Lithic bedrock	7-20	---	Indurated	Low	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
Beach	Lithic bedrock	3-14	---	Strongly cemented	Moderate	Low
BVC:						
Bofecillos	Lithic bedrock	4-10	---	Indurated	Moderate	Low
Leyva	Lithic bedrock	7-20	---	Indurated	High	Low
BVE:						
Bofecillos	Lithic bedrock	4-10	---	Indurated	Moderate	Low
Leyva	Lithic bedrock	7-20	---	Indurated	High	Low
Horsetrap	Lithic bedrock	12-19	---	Indurated	Moderate	Low
CCE:						
Changas	---	---	---	---	High	High
Corazones	---	---	---	---	Moderate	Low
CHC:						
Chilicotal	---	---	---	---	Moderate	Low
CIB:						
Chillon	---	---	---	---	Low	Low
CLA:						
Chipotle	---	---	---	---	Moderate	Moderate
Riverwash	---	---	---	---	---	---
COC:						
Chispa	---	---	---	---	Moderate	Moderate
Chilicotal	---	---	---	---	Moderate	Low
CPC:						
Chispa	---	---	---	---	Moderate	Moderate
Tenneco	---	---	---	---	Moderate	Low
CTC:						
Corvus	Petrogypsic	6-12	---	Very strongly cemented	High	High
Yesum	---	---	---	---	High	High
Peligro	---	---	---	---	High	High
CVC:						
Culberspeth	Petrocalcic	6-20	---	Weakly cemented	Moderate	Low
Chilicotal	---	---	---	---	Moderate	Low
CWC:						
Culberspeth, moist	Petrocalcic	6-20	---	Weakly cemented	Moderate	Low
Kahn, moist	---	---	---	---	Moderate	Low
DEB:						
Dellahunt	---	---	---	---	Moderate	High

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
DNB:						
Dellahunt	---	---	---	---	Moderate	High
Neimahr	Lithic bedrock	8-20	---	Indurated	Moderate	Moderate
Joberanch	Petrogypsic	10-18	---	Strongly cemented	Moderate	High
DOC:						
Double	---	---	---	---	Moderate	Low
ELC:						
Elcor	Lithic bedrock	6-20	---	Indurated	High	High
ELE:						
Elcor	Lithic bedrock	6-20	---	Indurated	High	High
EPA:						
Elcor	Lithic bedrock	6-20	---	Indurated	High	High
Dellahunt	---	---	---	---	Moderate	High
Pokorny	Petrogypsic	4-20	---	Moderately cemented	High	High
EPE:						
Elcor	Lithic bedrock	6-20	---	Indurated	High	High
Pokorny	Petrogypsic	4-20	---	Weakly cemented	High	High
Walkerwells	---	---	---	---	High	High
Hollomex	---	---	---	---	High	High
GAA:						
Gypsic Aquisalids	---	---	---	---	High	High
HPC:						
Hollebeke	Petrogypsic	2-10	---	Weakly cemented	High	High
	Lithic bedrock	10-20	---	Indurated		
Pokorny	Petrogypsic	4-20	---	Strongly cemented	High	High
HRC:						
Horsetrap	Lithic bedrock	12-20	---	Indurated	Moderate	Low
Bofecillos	Lithic bedrock	4-10	---	Indurated	Moderate	Low
KPB:						
Kinco	---	---	---	---	Moderate	Low
Aguena	---	---	---	---	Moderate	Low
Perilla	---	---	---	---	Moderate	Low
LPG:						
Lampshire	Lithic bedrock	4-20	---	Indurated	Moderate	Low
Pantak	Lithic bedrock	7-20	---	Indurated	Low	Low
LRE:						
Lark	---	---	---	---	Moderate	High
MAB:						
McAllister	---	---	---	---	Moderate	Low
MCB:						
Michigan	---	---	---	---	High	Moderate
MHA:						
Monahans	---	---	---	---	Moderate	High

Table 24.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
		In	In			
OCB:						
Ojinaga	Petrocalcic	6-20	---	Very strongly cemented	Moderate	Low
Corazones	---	---	---	---	Moderate	Moderate
OCF:						
Ojinaga	Petrocalcic	6-20	---	Very strongly cemented	Moderate	Low
Corazones	---	---	---	---	Moderate	Low
PAG:						
Pantak	Lithic bedrock	7-20	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
PRA:						
Pantera	---	---	---	---	Moderate	Moderate
Riverwash	---	---	---	---	---	---
RLA:						
Reyab, moist	---	---	---	---	Moderate	Low
RSA:						
Reyab	---	---	---	---	Moderate	Low
RXG:						
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
Lampshire	Lithic bedrock	4-20	---	Indurated	Moderate	Low
STB:						
Stovall	---	---	---	---	Moderate	Low
TEC:						
Tenneco, moist	---	---	---	---	Moderate	Low
VDA:						
Verhalen	---	---	---	---	High	High
Dalby	---	---	---	---	High	High
WAB:						
Walkerwells	---	---	---	---	High	High
YAG:						
Yarbam	Lithic bedrock	8-20	---	Indurated	Moderate	Low
Rock outcrop	Lithic bedrock	---	---	Indurated	---	---
YLA:						
Yesum	---	---	---	---	High	High
Loki	---	---	---	---	High	High
Corvus	Petrogypsic	6-12	---	Moderately cemented	High	High

Table 25.--Physical Analyses of Selected Soils

(The abbreviation "COLE" means coefficient of linear extensibility. Dashes indicate that data were not available.)

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 <0.002 mm	Total Clay	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 %
Dellahunt (1,2) (S08-TX109-004)																
08N01665	0-4	A	0.2	0.5	0.9	5.4	30.9	37.9	21.7	45.3	---	16.8	0.014	1.42	1.48	16.8
08N01666	4-10	Bw1	0.1	0.2	0.5	3.1	23.1	27.0	24.6	44.4	---	28.6	0.023	1.29	1.38	19.9
08N01667	10-17	Bw2	0.6	0.2	0.6	3.6	22.2	27.2	23.2	42.9	---	29.9	0.017	1.41	1.49	17.7
08N01668	17-31	Bky1	0.2	0.5	0.6	4.3	23.8	29.4	23.5	46.7	---	23.9	0.016	1.37	1.44	16.0
08N01669	31-38	Bky2	tr	0.1	0.2	0.9	19.5	20.7	32.0	58.1	---	21.2	0.002	1.39	1.40	16.7
08N01670	31-49	Bky3	---	tr	0.1	0.6	16.9	17.6	30.0	61.9	---	20.5	0.014	1.35	1.41	16.1
08N01671	49-56	Bky4	tr	tr	tr	7.5	45.1	52.6	12.5	37.0	---	10.4	0.004	1.52	1.54	7.4
08N01672	56-80	Bky5	---	tr	0.1	8.1	50.1	58.3	5.1	34.7	---	7.0	0.002	1.55	1.56	7.3
Double (1,3) (S08-TX109-021)																
7297	0-4	A	0.2	0.3	0.5	9.9	32.3	43.2	20.9	44.2	1.8	12.6	0.017	1.38	1.45	25.0
7298	4-13	Bw1	0.4	0.2	0.5	8.9	27.5	37.5	22.1	40.3	3.9	22.2	0.018	1.26	1.33	28.7
7299	13-23	Bw2	0.2	0.2	0.3	7.0	24.7	32.4	22.3	40.6	6.8	27.0	0.024	1.21	1.30	33.6
7300	23-38	Bk1	0.3	0.2	0.3	6.2	22.0	29.0	24.3	42.1	7.1	28.9	0.028	1.29	1.40	29.1
7301	38-56	Bk2	0.7	0.4	0.4	9.0	22.8	33.3	20.2	37.3	7.6	29.4	0.023	1.28	1.37	32.4
7302	56-84	Bk3	0.4	0.2	0.3	8.7	22.0	31.6	20.1	37.2	8.3	31.2	0.019	1.21	1.28	34.1
Elcor (1,2) (S08-TX109-005)																
08N01674	0-3	Ayy	0.1	0.4	0.4	3.5	33.9	38.3	12.7	48.0	---	13.7	---	---	---	---
08N01675	3-7	Byy	---	0.4	1.6	4.0	33.0	39.0	6.2	40.5	---	20.5	---	---	---	---
08N01676	7-17	R	tr	0.2	0.3	6.0	34.6	41.1	17.2	41.9	---	17.0	---	---	---	---
Hollebeke (2,5) (S83TX109001)																
83P04505	0-1	A	1.5	3.1	6.8	21.9	14.3	47.6	18.8	46.1	---	6.3	---	1.09	1.09	28.3
83P04506	1-6	C1	0.2	1.5	5.3	14.9	17.3	39.2	21.5	54.0	---	6.8	---	1.08	1.08	14.6
83P04507	6-12	C2	0.6	3.7	8.4	14.5	14.4	41.6	30.0	52.4	---	6.0	---	1.37	1.37	18.3
83P04508	12-18	Cr1	1.5	4.4	9.6	15.5	16.0	47.0	17.9	47.2	---	5.8	---	1.49	1.49	13.3
83P04509	18-35	Cr2	12.2	10.9	9.2	11.1	9.5	52.9	21.1	43.3	---	3.8	---	1.79	1.79	21.6

Table 25.--Physical Analyses of Selected Soils

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2.0-0.05 mm)	Fine Silt (0.02-0.002 mm)	Total Silt	Fine Clay <0.002 mm	Total Clay	COLE	Bulk Density: 1/3-bar	Oven Dry	Water Content 1/3- bar
	In		(by weight)										cm/cm	g/cc	g/cc	Wt %
Joberanch (1,2) (S08-TX109-003)																
08N01656	0-3	A1	0.6	1.0	1.9	7.5	29.2	40.2	21	42.9	---	16.9	---	---	---	---
08N01657	3-8	A2	0.3	0.8	1.0	3.2	19.4	24.7	25.7	47.1	---	28.2	0.013	1.23	1.28	16
08N01658	8-12	Bky	0.2	0.7	1.5	2.9	23.5	28.8	21.9	47.1	---	24.1	0.005	1.26	1.33	19.8
08N01659	12-19	2Byym1	0.1	0.2	0.2	0.8	10.4	11.7	32.1	55.1	---	33.2	0.005	1.33	1.35	16.6
08N01660	19-32	2Byym2	---	---	tr	0.4	6.5	6.9	36.9	59.5	---	33.6	0.003	1.25	1.26	15.8
08N01661	32-49	2Byym3	---	tr	0.1	0.2	25.2	25.5	20.6	60.6	---	13.9	0.001	1.57	1.59	15.7
08N01662	49-59	2Byym4	---	0.1	0.1	0.6	18.4	19.2	26.0	54.7	---	26.1	tr	1.51	1.52	16.5
08N01663	59-72	2Byym5	tr	0.1	0.1	4.0	49.2	53.4	10.5	34.4	---	12.2	---	1.47	1.47	12.7
08N01664	72-80	2Byym6	---	tr	tr	5.4	48.2	53.7	9.4	36.0	---	10.3	0.001	1.55	1.56	14.0
Niemahr (1,4) (S09-TX109-001)																
	0-5	A	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	5-10	Bw	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-17	Bk	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	17-27	R	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pokorny (1,2) (S06USTX109-902)																
07N00493	0-1	A	---	---	---	---	---	---	---	---	---	---	---	---	---	---
07N00494	1-6	By1	0.1	0.6	2.5	14.3	31.0	48.5	16.9	39.6	---	11.9	0.006	1.15	1.17	36.8
07N00495	6-17	By2	0.1	0.6	2.4	9.2	37.3	49.6	16.4	38.1	---	12.3	0.003	1.17	1.18	32.8
07N00496	17-28	Bym1	0.5	0.3	1.6	4.0	27.7	34.1	28.0	56.2	---	9.7	0.002	1.30	1.31	22.8
07N00497	28-37	Bym2	0.3	1.2	1.7	2.0	26.0	31.2	24.3	66.5	---	2.3	0.003	1.44	1.45	21.9
07N00498	37-52	Bym3	---	0.7	1.1	2.1	6.8	10.7	45.7	52.2	---	37.1	0.003	1.24	1.25	29.4
07N00499	52-80	Bym4	1.1	0.7	1.1	3.9	7.0	13.8	53.6	62.2	---	24.0	---	1.28	1.29	29.5
Reyab (1,3) (S08-TX109-025)																
7313	0-3	A	0.0	0.2	0.3	1.9	14.9	17.3	36.7	71.6	1.1	11.1	0.025	1.05	1.13	51.0
7314	3-13	Bw1	0.1	0.2	0.3	2.7	15.3	18.6	33.7	54.8	3.0	26.6	0.022	1.16	1.26	36.9
7315	13-24	Bw2	0.0	0.1	0.2	2.4	14.2	16.9	32.6	48.1	6.6	35.0	0.039	1.25	1.40	33.8
7316	24-31	Bw3	0.1	0.1	0.3	4.2	15.9	20.6	29.0	41.3	7.1	38.1	0.033	1.27	1.40	32.0
7317	31-42	Bk1	0.1	0.1	0.3	5.4	17.6	23.5	26.5	37.3	6.8	39.2	0.028	1.38	1.50	27.8
7318	42-54	Bk2	0.1	0.1	0.1	4.3	19.0	23.6	26.9	42.7	6.2	33.7	0.033	1.35	1.49	29.3
7319	53-72	Bk3	0.0	0.0	0.1	2.5	19.2	21.8	28.6	46.7	6.6	31.5	0.035	1.27	1.41	34.5
7320	72-82	Bk4	0.1	0.0	0.1	4.0	23.3	27.5	26.8	47.5	4.1	25.0	0.022	1.33	1.42	31.7

Table 25.--Physical Analyses of Selected Soils

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 <0.002 mm	Total Clay	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 %
Walkerwells (1,2) (S08-TX109-009)																
08N01692	0-6	A1	0.1	0.2	0.5	1.6	11.4	13.8	32.5	53.9	---	32.3	---	---	---	---
08N01694	6-9	A2	tr	0.2	0.3	0.8	8.7	10.0	38.6	57.7	---	32.3	---	---	---	---
08N01696	9-15	Ab1	---	0.1	0.3	1.5	11.8	13.7	36.0	53.5	4.0	32.8	0.045	1.13	1.29	28.1
08N01697	15-20	Ab2	tr	0.1	0.7	4.8	13.8	19.4	32.8	49.5	3.0	31.1	0.032	1.23	1.35	27.0
08N01698	20-36	Ab3	---	0.2	0.9	2.5	11.7	15.3	32.0	47.0	3.9	37.7	0.037	1.22	1.36	27.4
08N01699	36-39	Bwb1	tr	0.1	0.4	2.2	12.5	15.2	31.6	47.5	5.0	37.3	0.044	1.29	1.47	27.2
08N01700	39-52	Bwb2	tr	0.1	0.4	2.0	10.1	12.6	31.7	46.0	10.5	41.4	0.034	1.31	1.45	25.8
08N01701	52-62	Bkyb	tr	tr	0.1	0.6	6.4	7.1	29.2	42.6	18.5	50.3	0.058	1.44	1.72	22.5
08N01702	62-80	Byb	tr	0.1	0.4	1.5	9.9	11.9	27.2	43.3	18.0	44.8	0.015	1.51	1.58	18.0

Footnotes

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 Laboratory analyses by National Soil Survey Laboratory, USDA Natural Resources Conservation Service, Lincoln, Nebraska.

3 Laboratory analyses by Soil Characterization Laboratory, Texas A&M University, College Station, Texas.

4 Laboratory analyses by Soil Characterization Laboratory, Texas Tech University, Lubbock, Texas.

5 Location of Hollobeke; USGS topographic quadrangle: Outlaw Spring; Latitude: 31 degrees 53 minutes 0.0 seconds N; Longitude: 104 degrees 19 minutes 34.0 seconds W; UTM Zone: 13; UTM Easting: 563687 meters; UTM Northing: 3527715 meters.

Table 26.--Chemical Analyses of Selected Soils

(Dashes indicate that analyses were not made)

Soil name and sample number	Depth	Horizon	Carbon/ Nitrogen Ratio	pH 1:1 (soil: water)	Extractable bases				Sum of Bases	Cation Exchange capacity (pH 7)	Base Saturation (NH_4)	Carbonate as $CaCO_3$ (<2mm)	Gypsum $CaSO_4$* $2H_2O$ (<2mm)	Electrical Conductivity
					Ca	Mg	K	Na						
	In			pH	Meq/100gm						Pct	Pct	Pct	dS/m
Dellahunt (1,2) (S08-TX109-004)														
08N01665	0-4	A	11	8.4	56.4*	1.1	1.4	---	58.9	15.8	100	6	---	0.87
08N01666	4-10	Bw1	3	8.3	58.4*	1.2	0.7	---	60.3	14.1	100	27	---	0.68
08N01667	10-17	Bw2	1	8.4	56.3*	1.3	0.6	---	58.2	13.4	100	28	---	0.70
08N01668	17-31	Bky1	---	8.2	53.8*	1.2	0.5	---	55.5	11.1	100	30	---	0.93
08N01669	31-38	Bky2	7	7.9	61.6*	1.1	0.4	---	63.1	10.9	100	26	2	2.47
08N01670	31-49	Bky3	---	7.9	148.3*	1.1	0.4	---	149.2	11.1	100	22	8	2.41
08N01671	49-56	Bky4	---	7.9	237.1*	0.7	0.3	0.1	238.2	6.1	100	10	15	2.65
08N01672	56-80	Bky5	---	8.0	120.1*	0.6	0.2	tr	120.9	5.0	100	9	5	2.61
Double (1,3) (S08-TX109-021)														
7297	0-4	A	---	8.1	47.6	1.5	1.8	0.1	51.0	18.3	100	5	---	0.60
7298	4-13	Bw1	---	8.1	47.2	2.0	1.5	0.1	50.8	20.4	100	9	---	0.70
7299	13-23	Bw2	---	8.1	46.7	2.6	1.1	0.1	50.5	19.8	100	14	---	0.60
7300	23-38	Bk1	---	8.0	46.6	3.2	1.0	0.2	51.0	19.2	100	16	---	0.90
7301	38-56	Bk2	---	8.1	46.2	3.0	0.7	0.3	50.2	17.9	100	15	---	0.70
7302	56-84	Bk3	---	8.0	46.1	3.1	0.6	0.4	50.2	18.5	100	16	---	1.00
Elcor (1,2) (S08-TX109-005)														
08N01674	0-3	Ayy	9	8.0	318.4*	0.1	0.2	---	318.7	3.9	100	7	67	2.16
08N01675	3-7	Byy	1	8.0	291.2*	0.1	0.1	---	291.4	1.5	100	5	81	---
08N01676	7-17	R	2	8.0	51.7	12.4	---	---	---	0.3	99	4	64	2.19

Table 26.--Chemical Analyses of Selected Soils

(Dashes indicate that analyses were not made)

Soil name and sample number	Depth	Horizon	Carbon/ Nitrogen Ratio	pH 1:1 (soil: water)	Extractable bases				Sum of Bases	Cation Exchange capacity (pH 7)	Base Satur- ation (NH_4)	Carbonate as $CaCO_3$ (<2mm)	Gypsum $CaSO_4$* $2H_2O$ (<2mm)	Electri cal Conduct ivity
					Ca	Mg	K	Na						
	In			pH	Meq/100gm						Pct	Pct	Pct	dS/m
Hollebeke (2,5) (S83TX109001)														
83P04505	0-1	A	10	7.5	247.0*	0.1	0.1	tr	---	3.4	100	3	55	2.40
83P04506	1-6	C1	10	7.5	267.0*	0.1	tr	tr	---	1.3	100	1	92	2.34
83P04507	6-12	C2	7	7.6	269.7*	0.1	tr	tr	---	1.0	100	1	95	2.32
83P04508	12-18	Cr1	---	7.2	283.9*	0.1	---	0.1	---	0.4	100	2	96	2.42
83P04509	18-35	Cr2	---	7.5	289.0*	0.1	---	tr	---	0.4	100	2	95	2.42
Joberanch (1,2) (S08-TX109-003)														
08N01656	0-3	A1	5	8.0	64.7*	0.8	0.7	---	66.2	12.2	100	22	---	1.73
08N01657	3-8	A2	1	8.3	76.7*	0.7	0.4	---	77.8	12.8	100	40	---	0.64
08N01658	8-12	Bky	---	7.9	87.7*	0.5	0.3	---	88.5	12.2	100	40	tr	2.17
08N01659	12-19	2Byym1	---	7.9	331.4*	0.3	0.2	---	331.9	4.4	100	9	70	2.27
08N01660	19-32	2Byym2	---	7.9	325.8*	0.3	0.3	---	326.4	5.5	100	10	68	2.33
08N01661	32-49	2Byym3	---	7.9	323.1*	0.7	0.2	---	324.0	5.3	100	8	41	2.51
08N01662	49-59	2Byym4	---	7.9	323.4*	0.6	0.2	---	324.2	5.2	100	8	58	2.41
08N01663	59-72	2Byym5	---	7.9	274.5*	0.3	0.2	---	275.0	3.4	100	4	52	---
08N01664	72-80	2Byym6	---	7.9	324.4*	0.4	0.2	---	325.0	4.5	100	6	34	2.25
Niemahr (1,4) (S09-TX109-001)														
	0-5	A	---	7.3	18.2	0.9	1.2	0.5	20.8	---	---	23	0	1.50
	5-10	Bw	---	7.6	20.2	1.2	0.2	1.0	22.6	---	---	32	0	1.90
	10-17	Bk	---	7.8	34.3	2.0	0.2	1.2	37.7	---	---	39	1	2.80
	17-27	R	---	7.7	29.5	0.9	0.3	0.8	31.4	---	---	4	60	2.40

Table 26.--Chemical Analyses of Selected Soils

(Dashes indicate that analyses were not made)

Soil name and sample number	Depth	Horizon	Carbon/ Nitrogen Ratio	pH 1:1 (soil: water)	Extractable bases				Sum of Bases	Cation Exchange capacity (pH 7)	Base Saturation (NH_4)	Carbonate as $CaCO_3$ (<2mm)	Gypsum $CaSO_4$* $2H_2O$ (<2mm)	Electrical Conductivity
					Ca	Mg	K	Na						
	In			pH	Meq/100gm						Pct	Pct	Pct	dS/m
Pokorny (1,2) (S06USTX109-902)														
07N00493	0-1	A	11	7.7	60.5*	0.8	0.9	---	62.2	13.1	100	18	---	3.01
07N00494	1-6	By1	14	7.8	282.8*	0.1	0.1	---	283.0	0.9	100	4	86	2.37
07N00495	6-17	By2	10	8.1	329.9*	1.2	0.1	0.1	331.3	1.0	100	2	88	2.41
07N00496	17-28	Bym1	---	8.1	378.0*	2.2	0.3	1.0	381.5	3.0	100	10	60	3.64
07N00497	28-37	Bym2	---	8.0	325.8*	0.8	0.2	1.0	327.8	1.1	100	8	80	4.14
07N00498	37-52	Bym3	9	8.2	333.3*	0.5	0.1	1.2	335.1	0.4	100	5	78	4.93
07N00499	52-80	Bym4	3	8.2	278.6*	0.9	0.1	1.3	280.9	0.9	100	6	86	5.28
Reyab (1,3) (S08-TX109-025)														
7313	0-3	A		8.1	56.5	3.0	1.9	0.1	63.5	29.0	100	17.3	---	0.5
7314	3-13	Bw1		8.0	57.3	3.8	2.1	0.1	63.3	29.3	100	17.0	---	0.6
7315	13-24	Bw2		7.9	46.8	5.9	1.4	0.1	54.2	25.9	100	24.4	---	1.1
7316	24-31	Bw3		8.0	47.4	5.8	1.1	0.2	54.5	19.7	100	25.3	---	1.1
7317	31-42	Bk1		8.1	46.6	5.8	0.9	0.2	53.5	18.5	100	24.7	---	0.7
7318	42-54	Bk2		8.3	46.9	8.7	0.9	0.6	57.1	19.6	100	19.6	---	0.6
7319	53-72	Bk3		8.3	46.6	9.6	0.6	1.0	58.0	19.6	100	19.1	---	0.7
7320	72-82	Bk4		8.4	46.4	9.6	0.6	1.5	58.1	18.6	100	11.3	---	1.0

Table 26.--Chemical Analyses of Selected Soils

(Dashes indicate that analyses were not made)

Soil name and sample number	Depth	Horizon	Carbon/ Nitrogen Ratio	pH 1:1 (soil: water)	Extractable bases				Sum of Bases	Cation Exchange capacity (pH 7)	Base Saturation (NH_4)	Carbonate as $CaCO_3$ (<2mm)	Gypsum $CaSO_4$* $2H_2O$ (<2mm)	Electrical Conductivity
					Ca	Mg	K	Na						
	In			pH	Meq/100gm						Pct	Pct	Pct	dS/m
Walkerwells (1,2) (S08-TX109-009)														
08N01692	0-6	A1	9	8.1	66.8*	1.4	2.0	---	70.2	28.7	100	20	---	0.87
08N01694	6-9	A2	8	8.1	63.1*	1.0	1.4	---	65.5	27.7	100	21	---	1.46
08N01696	9-15	Ab1	9	8.2	65.2*	1.0	1.1	---	67.3	28.6	100	19	---	0.93
08N01697	15-20	Ab2	11	8.2	65.1*	1.0	1.2	---	67.3	26.0	100	16	---	1.40
08N01698	20-36	Ab3	6	8.0	62.8*	1.1	1.2	---	65.1	27.2	100	17	---	1.46
08N01699	36-39	Bwb1	9	8.0	63.1*	1.2	1.0	---	65.3	25.6	100	19	---	1.39
08N01700	39-52	Bwb2	6	7.9	68.7*	1.5	1.0	---	71.2	21.9	100	25	1	2.35
08N01701	52-62	Bkyb	11	8.0	96.5*	8.1	1.1	0.8	106.5	17.1	100	35	4	4.16
08N01702	62-80	Byb	1	8.6	283.8*	11.7	1.0	1.9	298.4	9.5	100	22	31	8.38

*Extractable Ca may contain Ca from calcium carbonate or gypsum. CEC7 base saturation set to 100.

Footnotes

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 Laboratory analyses by National Soil Survey Laboratory, USDA Natural Resources Conservation Service, Lincoln, Nebraska.

3 Laboratory analyses by Soil Characterization Laboratory, Texas A&M University, College Station, Texas.

4 Laboratory analyses by Soil Characterization Laboratory, Texas Tech University, Lubbock, Texas.

5 Location of Hollobeke; USGS topographic quadrangle: Outlaw Spring; Latitude: 31 degrees 53 minutes 0.0 seconds N; Longitude: 104 degrees 19 minutes 34.0 seconds W; UTM Zone: 13; UTM Easting: 563687 meters; UTM Northing: 35277

Table 27.--Mineralogy Analyses of Selected Soils

(Analysis by National Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska. Relatvie Peak Size; 5-Very large; 4-Large; 3-Medium; 2-Small; 1-Very small. Dashes indicate that none of the mineral was detected)

Soil name and sample number	Depth	Horizon	Peak Size							
			Gypsum	Thenardite	Mica	Calcite	Halloysite	Quartz	Kaolinite	Montmorillinite
	In									
Hollebeke (2) (S83TX109001)										
83P04505	0-1	A	2	---	---	---	---	---	---	---
83P04506	1-6	C1	2	2	1	---	---	---	---	---
83P04507	6-12	C2	3	2	---	---	---	---	---	---
83P04508	12-18	Cr1	3	2	---	---	---	---	---	---
83P04509	18-35	Cr2	3	2	---	---	---	---	---	---
Pokorny (1) (S06USTX109-902)										
07N00493	0-1	A	---	---	1	1	---	1	---	---
07N00495	6-17	By2	---	---	1	---	---	---	1	---
07N00497	28-37	Bym2	2	---	---	---	---	---	1	---
07N00499	52-80	Bym4	---	---	---	---	1	---	---	---
Walkerwells (1) (S08-TX109-009)										
08N01692	0-6	A1	---	---	1	---	---	---	2	1
08N01696	9-15	Ab1	---	---	2	---	---	---	2	1
08N01698	20-36	Ab3	---	---	2	---	---	---	2	2
08N01700	39-52	Bwb2	---	---	2	---	---	---	2	2

Footnotes

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 Location of Hollobeke; USGS topographic quadrangle: Outlaw Spring; Latitude: 31 degrees 53 minutes 0.0 seconds N; Longitude: 104 degrees 19 minutes 34.0 seconds W; UTM Zone: 13; UTM Easting: 563687 meters; UTM Northing: 3527715 meters.

Table 28.--Grain Count for Selected Soils

(Analyses performed at National Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska. Dashes indicate that the material was not detected)

Soil sample and Laboratory number	Depth	Horizon	Dominant Mineral (1)																								
			QZ	FK	FP	FE	CD	CB	OP	GS	PR	HN	GN	PO	ZR	AR	TM	MS	BT	BY	CA	MG	ZE	DI	FM	RU	GC
Pokorny (4) (S06USTX109-902)																											
07N00493 (3)	0-1	A	66	24	---	tr	---	1	tr	---	tr	tr	tr	---	---	1	tr	tr	tr	---	7	tr	tr	---	---	---	
07N00495 (2)	6-17	By2	66	19	tr	1	---	---	2	2	tr	tr	---	tr	tr	2	tr	1	2	tr	2	tr	1	1	tr	tr	
07N00497 (3)	28-37	Bym2	55	24	tr	---	---	1	---	---	1	tr	tr	---	tr	tr	tr	---	---	---	19	tr	---	---	---	---	
07N00499 (2)	52-80	Bym4	65	24	1	tr	tr	---	tr	1	1	tr	tr	---	---	tr	tr	2	3	tr	tr	---	---	---	tr	tr	
Walkerwells (4) (S08-TX109-009)																											
08N01692 (2)	0-6	A1	58	19	tr	1	1	1	2	---	1	tr	tr	1	tr	2	tr	2	1	tr	11	---	tr	---	---	tr	1
08N01696 (2)	9-15	Ab1	58	11	tr	1	2	4	1	tr	1	tr	tr	1	tr	5	---	3	1	tr	10	---	tr	---	---	tr	1
08N01698 (2)	20-36	Ab3	60	17	tr	1	1	3	1	1	1	tr	tr	1	---	3	tr	1	tr	tr	8	tr	tr	---	---	tr	tr
08N01700 (2)	39-52	Bwb2	51	19	1	1	1	3	1	1	1	1	tr	tr	tr	4	tr	3	2	tr	12	tr	tr	---	---	tr	tr

Footnotes

1 QZ-Quartz; FK-Feldspar; FP-Plagioclase Feldspar; FE-Iron Oxides (Goethite); CD-Chert (Chalcedony); CB-Carbonate Aggregates; OP-Opagues; GS-Glass; PR-Pyroxene; HN-Hornblende; GN-Garnet; PO-Plant Opal; ZR-Zircon; AR-Weatherable aggregates; TM-Tourmaline; MS-Muscovite; BT-Biotite; BY-Beryl; CA-Calcite; MG-Magnetite; ZE-Zeolite; DI-Diatoms; FM-Ferromangnesium mineral; RU-Rutile; GC-Glass coated grain.

2 Coarse silt fraction

3 Very fine sand fraction

4 Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

Table 29.--Engineering Index Properties for Selected Soils

(Analyses performed at National Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska. Dashes indicate that the material was not detected)

Soil name and Sample Number	Depth	Horizon	Grain Size Distribution						
			Percentage Passing Sieve						
			4	10	40	200	20	5	2
	In		----------Number----------				-----Microns ---		
Dellahunt (1,2)									
(S08-TX109-004)									
08N01665	0-4	A	100	100	99	82	39	25	17
08N01666	4-10	Bw1	100	99	99	87	53	38	28
08N01667	10-17	Bw2	99	90	89	79	48	35	27
08N01668	17-31	Bky1	99	96	95	83	46	32	23
08N01669	31-38	Bky2	97	92	92	85	49	31	20
08N01670	31-49	Bky3	100	98	98	92	49	32	20
08N01671	49-56	Bky4	77	73	73	56	17	11	8
08N01672	56-80	Bky5	100	98	98	73	12	9	7
Elcor (1,2)									
(S08-TX109-005)									
08N01674	0-3	Ayy	100	98	---	---	---	---	---
08N01675	3-7	Byy	100	99	98	83	26	19	14
08N01676	7-17	R	64	59	59	49	16	14	12
Hollebeke (2,3)									
(S83TX109001)									
83P04505	0-1	A	100	100	94	60	25	14	6
83P04506	1-6	C1	99	99	96	71	28	15	7
83P04507	6-12	C2	100	100	94	67	36	18	6
83P04508	12-18	Cr1	100	100	92	63	24	13	6
83P04509	18-35	Cr2	100	100	75	52	25	12	4
Joberanch (1,2)									
(S08-TX109-003)									
08N01656	0-3	A1	100	99	97	78	38	25	17
08N01657	3-8	A2	100	99	98	87	53	38	28
08N01658	8-12	Bky	99	98	97	85	45	32	24
08N01659	12-19	2Byym1	100	98	98	92	64	45	33
08N01660	19-32	2Byym2	100	99	99	96	70	48	33
08N01661	32-49	2Byym3	19	16	16	15	6	4	2
08N01662	49-59	2Byym4	15	13	13	12	7	5	3
08N01663	59-72	2Byym5	57	55	55	44	12	9	7
08N01664	72-80	2Byym6	48	41	41	32	8	6	4
Pokorny (1,2)									
(S06USTX109-902)									
07N00493	0-1	A	100	100	99	71	29	19	12
07N00494	1-6	By1	100	99	98	83	37	21	10
07N00495	6-17	By2	97	96	95	89	79	53	36
07N00496	17-28	Bym1	88	84	84	74	35	25	18
07N00497	28-37	Bym2	96	94	94	84	42	30	23
07N00498	37-52	Bym3	100	98	97	87	45	27	15
07N00499	52-80	Bym4	100	100	100	94	55	22	1

Table 29.--Engineering Index Properties for Selected Soils--Continued

Soil name and Sample Number	Depth	Horizon	Grain Size Distribution						
			Percentage Passing Sieve						
			4	10	40	200	20	5	2
	In		----------Number----------				-----Microns ---		
Walkerwells (1,2) (S08-TX109-009)									
08N01692	0-6	A1	100	100	100	93	65	45	32
08N01694	6-9	A2	100	100	100	95	71	48	32
08N01696	9-15	Ab1	100	100	100	93	69	47	33
08N01697	15-20	Ab2	100	100	100	88	64	44	31
08N01698	20-36	Ab3	100	100	100	91	70	50	38
08N01699	36-39	Bwb1	100	100	100	92	69	50	37
08N01700	39-52	Bwb2	100	100	100	93	73	54	41
08N01701	52-62	Bkyb	100	93	93	90	74	58	47
08N01702	62-80	Byb	100	99	99	93	71	55	44

Footnotes

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 Laboratory analyses by National Soil Survey Laboratory, USDA Natural Resources Conservation Service, Lincoln, Nebraska.

3 Location of Hollobeke; USGS topographic quadrangle: Outlaw Spring;
Latitude: 31 degrees 53 minutes 0.0 seconds N;
Longitude: 104 degrees 19 minutes 34.0 seconds W; UTM Zone: 13;
UTM Easting: 563687 meters; UTM Northing: 3527715 meters.

Table 30.--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
Aguena	Mixed, thermic Ustic Torripsamments
Allamore	Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplocalcids
Antbed	Fine, mixed, superactive, thermic Ustic Haplargids
Beach	Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents
Bissett	Loamy-skeletal, carbonatic, thermic Lithic Ustic Haplocalcids
Bofecillos	Loamy-skeletal, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents
Changas	Fine, smectitic, hyperthermic Leptic Haplogypsids
Chilicotal	Loamy-skeletal, mixed, superactive, thermic Ustic Haplocalcids
Chillon	Loamy-skeletal, mixed, superactive, hyperthermic Ustic Haplocambids
Chipotle	Sandy-skeletal, mixed, thermic Ustic Torrifluvents
Chispa	Fine-loamy, mixed, superactive, thermic Ustic Haplocalcids
Corazones	Loamy-skeletal, mixed, superactive, hyperthermic Ustic Haplocalcids
Corvus	Coarse-gypseous, hypergypsic, thermic, shallow Typic Petrogypsids
Culberspeth	Loamy, mixed, superactive, thermic, shallow Calcic Petrocalcids
Dalby	Fine, smectitic, thermic Chromic Haplotorrerts
Dellahunt	Fine-silty, mixed, superactive, thermic Ustic Calcigypsids
Double	Fine-loamy, mixed, superactive, thermic Ustic Haplocambids
Elcor	Fine-gypseous, hypergypsic, thermic Lithic Haplogypsids
Gypsic Aquisalids	Gypsic Aquisalids
Hollebeke	Fine-gypseous, hypergypsic, thermic, shallow Ustic Petrogypsids
Hollomex	Fine-gypseous, hypergypsic, thermic Ustic Haplogypsids
Horsetrap	Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplocambids
Joberanch	Loamy, mixed, superactive, thermic, shallow Ustic Petrogypsids
Kahn	Fine-loamy, mixed, superactive, thermic Ustic Haplocalcids
Kinco	Coarse-loamy, mixed, superactive, thermic Ustic Haplocalcids
Lampshire	Loamy-skeletal, mixed, superactive, nonacid, thermic Lithic Ustic Torriorthents
Lark	Hypergypsic, thermic Typic Torripsamments
Leyva	Clayey-skeletal, mixed, superactive, thermic Lithic Ustic Haplargids
Loki	Loamy over fine-gypseous, mixed over hypergypsic, superactive, thermic Typic Calcigypsids
McAllister	Fine-loamy, mixed, superactive, thermic Ustic Calciargids
Michigan	Fine, mixed, superactive, thermic Ustic Haplocambids
Monahans	Coarse-loamy, mixed, superactive, thermic Typic Calcigypsids
Neimahr	Loamy, mixed, superactive, thermic Lithic Ustic Haplocambids
Ojinaga	Loamy-skeletal, mixed, superactive, hyperthermic, shallow Calcic Petrocalcids
Pantak	Loamy-skeletal, mixed, superactive, thermic Lithic Ustic Haplargids
Pantera	Sandy-skeletal, mixed, hyperthermic Ustic Torrifluvents
Peligro	Coarse-gypseous, hypergypsic, thermic Leptic Haplogypsids
Perilla	Coarse-loamy, mixed, superactive, thermic Ustic Haplocambids
Pokorny	Fine-gypseous, hypergypsic, thermic, shallow Ustic Petrogypsids
Reyab	Fine-silty, mixed, superactive, thermic Ustic Haplocambids
Stovall	Fine-silty, mixed, superactive, thermic Ustic Haplocalcids
Tenneco	Fine-loamy, mixed, superactive, thermic Ustic Haplocambids
Verhalen	Fine, smectitic, thermic Typic Haplotorrerts
Walkerwells	Fine-silty, mixed, superactive, thermic Ustifluventic Haplocambids
Yarbam	Loamy-skeletal, mixed, superactive, thermic Aridic Lithic Haplustolls
Yesum	Fine-gypseous, hypergypsic, thermic Leptic Haplogypsids

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