United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with the New Mexico Agricultural Experiment Station

Soil Survey of Curry and Southwest Quay Counties, New Mexico

How To Use This Soil Survey

General Soil Map

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

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

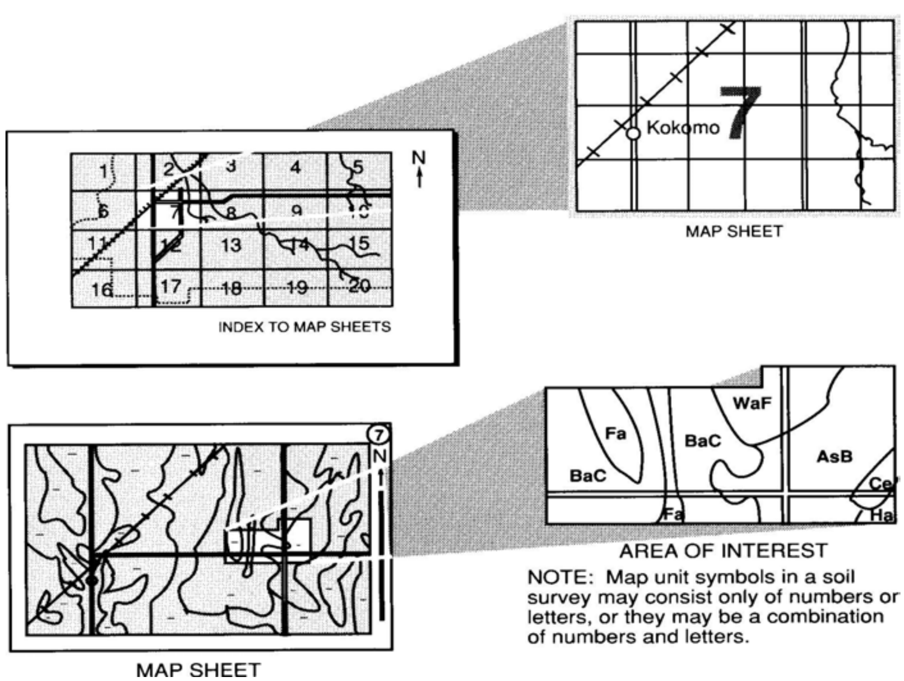
Detailed Soil Maps

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

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

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

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



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the Natural Resources Conservation Service and the New Mexico Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Central Curry and Southwest Quay Soil and Water Conservation Districts.

Major fieldwork for this soil survey was completed in 1997. Soil names and descriptions were approved in 2007. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2007. The most current official data are available on the Internet.

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

Cover: The principle dryland crops grown are winter wheat and grain sorghum, shown here, on Olton clay loam, 0 to 1 percent slopes.

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

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Issued 2007

Foreword

Soil surveys contain information that affects land use planning in survey areas. They include predictions of soil behavior for selected land uses. The surveys highlight soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

Soil surveys are designed for many different users. Farmers, ranchers, foresters, and agronomists can use the surveys 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 surveys 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 surveys 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 too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or New Mexico Cooperative Extension.

Dennis Alexander
State Conservationist
Natural Resources Conservation Service

Soil Survey of Curry and Southwest Quay Counties, New Mexico

By Robert A. Hill

Fieldwork by Rusty Dowell, Robert A. Hill, and Ken Scheffe

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
New Mexico Agricultural Experiment Station

This soil survey updates the survey of Curry County and Southwest Quay Soil Surveys published in 1958 and 1960 respectively (USDA). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the Survey Area

This section provides climate information about Curry and Southwest Quay Counties.

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 a climate station in Clovis, New Mexico.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Clovis 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 39.1 degrees F and the average daily minimum temperature is 25.4 degrees. The lowest temperature on record, which occurred at Clovis on February 1, 1951, is -17 degrees. In summer, the average temperature is 75.3 degrees and the average daily maximum temperature is 88.9 degrees. The highest temperature, which occurred at Clovis on June 25, 1990, is 110 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 18.65 inches. Of this, about 15.61 inches, or 84 percent, usually falls in April through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 5.26 inches at Clovis on September 7, 1957. Thunderstorms occur on about 54 days each year, and most occur in July.

The average seasonal snowfall is 14.0 inches. The greatest snow depth at any one time during the period of record was 14 inches recorded on January 30, 1999. On an average, 11 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 11 inches recorded on November 27, 1923.

The average relative humidity in mid-afternoon is about 41 percent. Humidity is higher at night, and the average at dawn is about 68 percent. The sun shines 78 percent of the time in summer and 68 percent in winter. The prevailing wind is from the southwest. Average wind speed is highest, 14.5 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. 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.

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, Acuff Loam, 0 to 1 percent slopes is a phase of the Acuff series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Tucumcari-Hassell clay loams, 0 to 5 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. Tucumcari-Redona association, 0 to 5 percent slopes is an example.

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

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

Table 4 lists the map units in this survey area. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

10—Regnier-Rock outcrop-Lacoca complex, 30 to 80 percent slopes

Map Unit Setting

Major land resource area: 70
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Regnier and similar soils: 35 percent
Rock outcrop: 30 percent
Lacoca and similar soils: 20 percent
Minor components: 15 percent

Component Descriptions

Regnier soils

Landscape: Breaks
Landform: Scarp slopes
Parent material: Colluvium and slope alluvium derived from sandstone and shale
Slope: 30 to 80 percent
Surface fragments: About 2 percent subangular channers
Depth class: Shallow
Depth to restrictive feature: 12 to 20 inches to bedrock, paralithic

Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 1.8 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 20 percent
Gypsum average in horizon of maximum accumulation: About 3 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Breaks North Exposure
Potential native vegetation: Black grama, sideoats grama, New Mexico feathergrass, blue grama, little bluestem
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 3 inches; loam
C—3 to 12 inches; clay loam
Cr—12 to 60 inches; bedrock

Rock outcrop

Parent material: Sandstone and shale
Depth to restrictive feature: 0 inches to bedrock, lithic
Land capability subclass (nonirrigated): 8s

Lacoca soils

Landscape: Breaks
Landform: Structural benches
Parent material: Alluvium derived from sandstone and/or residuum weathered from sandstone
Slope: 30 to 50 percent
Surface fragments: About 5 percent subangular channers
Depth class: Very shallow and shallow
Depth to restrictive feature: 4 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 1.1 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 18 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Breaks North Exposure
Potential native vegetation: Blue grama, little bluestem, sideoats grama, New Mexico feathergrass, sand bluestem
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 8 inches; loam
R—8 to 60 inches; bedrock

Minor Components

Redona and similar soils
Composition: About 10 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy
Berwolf and similar soils
Composition: About 5 percent
Slope: 1 to 5 percent
Drainage class: Well drained
Ecological site: Sandy Plains

11—Tucumcari-Hassell clay loams, 0 to 5 percent slopes

Map Unit Setting

Major land resource area: 70
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Tucumcari and similar soils: 50 percent
Hassell and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Tucumcari soils

Landscape: Plains
Landform: Pediments
Parent material: Red bed alluvium derived from sandstone and shale
Slope: 0 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.8 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Clayey
Potential native vegetation: Blue grama, alkali sacaton, tobosa, sideoats grama, fourwing saltbush
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 5 inches; clay loam
Bt—5 to 19 inches; clay loam

Btk—19 to 49 inches; clay loam
Bk—49 to 60 inches; clay

Hassell soils

Landscape: Plains
Landform: Pediments
Parent material: Red bed alluvium derived from sandstone and shale
Slope: 0 to 5 percent
Depth class: Moderately deep
Depth to restrictive feature: 20 to 40 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 5.8 inches (low)
Shrink-swell potential: About 7.5 percent (high)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: About 2 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Clayey
Potential native vegetation: Blue grama, alkali sacaton, tobosa, sideoats grama, fourwing saltbush
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; clay loam
Bt1—4 to 22 inches; silty clay
Bt2—22 to 32 inches; clay
Cr—32 to 60 inches; bedrock

Minor Components

Lacoca and similar soils
Composition: About 10 percent
Slope: 5 to 20 percent
Depth to restrictive feature: 4 to 20 inches to bedrock, lithic
Drainage class: Well drained
Ecological site: Clayey

13—Tucumcari-Redona association, 0 to 5 percent slopes

Map Unit Setting

Major land resource area: 70
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Tucumcari and similar soils: 50 percent
Redona and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Tucumcari soils

Landscape: Plains
Landform: Swales
Parent material: Red bed alluvium derived from sandstone and shale
Slope: 0 to 2 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.7 inches (high)
Shrink-swell potential: About 4.4 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Clayey
Potential native vegetation: Blue grama, alkali sacaton, tobosa, sideoats grama, fourwing saltbush
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 5 inches; loam
Bt—5 to 19 inches; clay loam
Btk—19 to 49 inches; clay loam
Bk—49 to 60 inches; clay

Redona soils

Landscape: Plains
Landform: Pediments
Parent material: Red bed eolian and alluvium derived from sandstone and shale
Slope: 0 to 5 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 10.2 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: About 2 percent
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Loamy
Potential native vegetation: Blue grama, sideoats grama, tobosa, black grama, vine mesquite
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 4 inches; loam

Bt—4 to 23 inches; sandy clay loam
Btk—23 to 60 inches; loam

Minor Components

Gullied land
Composition: About 10 percent

28—Lacoca-San Jon-Rock outcrop complex, 5 to 20 percent slopes

Map Unit Setting

Major land resource area: 70
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Lacoca and similar soils: 40 percent
San Jon and similar soils: 30 percent
Rock outcrop: 15 percent
Minor components: 15 percent

Component Descriptions

Lacoca soils

Landscape: Hills
Landform: Structural benches
Parent material: Alluvium derived from sandstone and/or residuum weathered from sandstone
Slope: 5 to 20 percent
Surface fragments: About 5 percent subangular channers
Depth class: Very shallow and shallow
Depth to restrictive feature: 4 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 1.3 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Sandstone Savannah
Potential native vegetation: Blue grama, sideoats grama, New Mexico feathergrass, black grama, little bluestem
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 12 inches; cobbly fine sandy loam
R—12 to 60 inches; bedrock

San Jon soils

Landscape: Hills
Landform: Structural benches
Parent material: Red bed eolian and alluvium derived from sandstone and shale
Slope: 5 to 20 percent
Depth class: Moderately deep
Depth to restrictive feature: 20 to 40 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 4.7 inches (low)
Shrink-swell potential: About 4.3 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Loamy
Potential native vegetation: Blue grama, sideoats grama, tobosa, black grama, vine mesquite
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 6 inches; loam
Bw—6 to 33 inches; clay loam
R—33 to 60 inches; bedrock

Rock outcrop

Parent material: Barren sandstone and shale
Depth to restrictive feature: 0 inches to bedrock, lithic
Land capability subclass (nonirrigated): 8s

Minor Components

Tucumcari and similar soils
Composition: About 8 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Clayey
Redona and similar soils
Composition: About 7 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Loamy

31—Chispa-Redona association, 0 to 3 percent slopes

Map Unit Setting

Major land resource area: 70
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Chispa and similar soils: 50 percent
Redona and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Chispa soils

Landscape: Piedmont slopes
Landform: Low hills
Parent material: Red bed alluvium derived from sandstone and shale
Slope: 0 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.2 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 20 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 4 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Sandy Loam
Potential native vegetation: Black grama, blue grama, sand dropseed, sideoats grama
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 7 inches; fine sandy loam
Bk1 and Bk2—7 to 43 inches; sandy clay loam
BCk—43 to 60 inches; sandy clay loam

Redona soils

Landscape: Piedmont slopes
Landform: Alluvial flats
Parent material: Red bed alluvium derived from sandstone and shale
Slope: 0 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 10.2 inches (high)
Shrink-swell potential: About 4.3 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Sandy Loam
Potential native vegetation: Blue grama, little bluestem, sideoats grama, black grama, dropseed

Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 8 inches; fine sandy loam
Bt, Btk, Bk—8 to 60 inches; loam

Minor Components

Soils shallow to petrocalcic and similar soils
Composition: About 10 percent
Slope: 0 to 5 percent
Depth to restrictive feature: 9 to 20 inches to petrocalcic
Drainage class: Well drained
Ecological site: Shallow

32—Regnier-Lacoca-Rock outcrop complex, 3 to 25 percent slopes

Map Unit Setting

Major land resource area: 70
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Regnier and similar soils: 40 percent
Lacoca and similar soils: 30 percent
Rock outcrop: 15 percent
Minor components: 15 percent

Component Descriptions

Regnier soils

Landscape: Hills
Landform: Pediments
Parent material: Colluvium and slope alluvium derived from sandstone and shale
Slope: 3 to 20 percent
Surface fragments: About 2 percent subangular channers
Depth class: Shallow
Depth to restrictive feature: 12 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 1.9 inches (very low)
Shrink-swell potential: About 3.0 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 20 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)

Ecological site: Red Shale
Potential native vegetation: Alkali sacaton, blue grama, tobosa, buffalograss, fourwing saltbush
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 8 inches; loam
C—8 to 12 inches; clay loam
Cr—12 to 60 inches; bedrock

Lacoca soils

Landscape: Hills
Landform: Structural benches
Parent material: Alluvium derived from sandstone and/or residuum weathered from sandstone
Slope: 10 to 25 percent
Surface fragments: About 8 percent subangular channers
Depth class: Very shallow and shallow
Depth to restrictive feature: 4 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: None.7 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 20 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Shallow Sandstone
Potential native vegetation: Blue grama, little bluestem, sideoats grama, New Mexico feathergrass, black grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 5 inches; sandy loam
R—5 to 60 inches; bedrock

Rock outcrop

Parent material: Barren or nearly barren sandstone and shale
Depth to restrictive feature: 0 inches to bedrock, lithic
Land capability subclass (nonirrigated): 8s

Minor Components

Redona and similar soils
Composition: About 10 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy

Tucumcari and similar soils
Composition: About 5 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Clayey

36—Alama silt loam, 1 to 5 percent slopes

Map Unit Setting

Major land resource area: 70
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Alama and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Alama soils

Landscape: Plains
Landform: Alluvial flats
Parent material: Red bed alluvium derived from sandstone and shale
Slope: 1 to 5 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.5 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 8 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: Blue grama, galleta, sideoats grama, black grama, vine mesquite
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 3 inches; silt loam
Bw1, Bw2, Bw3—3 to 28 inches; silty clay loam
Bk, 2Bk—28 to 60 inches; silt loam

Minor Components

Tucumcari and similar soils
Composition: About 10 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Clayey

37—Ima-Gallen association, 2 to 7 percent slopes

Map Unit Setting

Major land resource area: 70

Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Ima and similar soils: 70 percent
Gallen and similar soils: 20 percent
Minor components: 10 percent

Component Descriptions

Ima soils

Landscape: Piedmonts
Landform: Hillslopes
Parent material: Red bed alluvium derived from sandstone and shale
Slope: 2 to 5 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 7.7 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Sandy Loam
Potential native vegetation: Blue grama, little bluestem, sideoats grama, black grama, dropseed
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 12 inches; fine sandy loam
Bw, Bk, C—12 to 60 inches; fine sandy loam

Gallen soils

Landscape: Piedmonts
Landform: Hills
Parent material: Gravelly slope alluvium derived from igneous, metamorphic, and sedimentary rock
Slope: 2 to 7 percent
Surface fragments: About 15 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 3.5 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 20 percent
Gypsum average in horizon of maximum accumulation: None

Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: Black grama, blue grama, sideoats grama, New Mexico feathergrass, sand dropseed
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 5 inches; gravelly sandy loam
Bw—5 to 20 inches; very gravelly sandy loam
Bk—20 to 60 inches; extremely gravelly sandy loam

Minor Components

Chispa and similar soils
Composition: About 5 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Sandy Loam
Redona and similar soils
Composition: About 5 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Sandy Loam

58—Redona-Armesa association, 0 to 5 percent slopes

Map Unit Setting

Major land resource area: 70
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Redona and similar soils: 50 percent
Armesa and similar soils: 25 percent
Minor components: 25 percent

Component Descriptions

Redona soils

Landscape: Plains
Landform: Pediments
Parent material: Red bed eolian and alluvium derived from sandstone and shale
Slope: 0 to 5 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 10.5 inches (high)
Shrink-swell potential: About 4.4 percent (moderate)
Runoff class: Low

Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Loamy
Potential native vegetation: Blue grama, sideoats grama, tobosa, black grama, vine mesquite
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 6 inches; sandy clay loam
Bt, Btk, Bk—6 to 60 inches; sandy clay loam

Armesa soils

Landscape: Plains
Landform: Pediments
Parent material: Eolian deposits and alluvium derived from sandstone and shale
Slope: 0 to 5 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.9 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 55 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Limy
Potential native vegetation: Blue grama, sideoats grama, black grama, hairy grama, sand dropseed
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 2 inches; sandy clay loam
Bw, Bk1, Bk2, Bk3—2 to 60 inches; sandy clay loam

Minor Components

Tucumcari and similar soils
Composition: About 10 percent
Slope: 0 to 5 percent
Drainage class: Well drained
Ecological site: Clayey
Chispa and similar soils
Composition: About 10 percent
Slope: 0 to 5 percent
Drainage class: Well drained
Ecological site: Sandy Loam
Soils shallow to petrocalcic and similar soils
Composition: About 5 percent

Slope: 0 to 5 percent
Depth to restrictive feature: 9 to 20 inches to petrocalcic
Drainage class: Well drained
Ecological site: Shallow

60—Chispa-Armesa-Redona association, 2 to 7 percent slopes

Map Unit Setting

Major land resource area: 70
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Chispa and similar soils: 40 percent
Armesa and similar soils: 30 percent
Redona and similar soils: 20 percent
Minor components: 10 percent

Component Descriptions

Chispa soils

Landscape: Piedmont slopes
Landform: Low hills
Parent material: Red bed alluvium derived from sandstone and shale
Slope: 2 to 5 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.9 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 4 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Sandy Loam
Potential native vegetation: Black grama, bush muhly, blue grama, sand dropseed, sideoats grama
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 7 inches; fine sandy loam
Bk1, Bk2—7 to 32 inches; sandy clay loam
BCk—32 to 60 inches; sandy clay loam

Armesa soils

Landscape: Piedmont slopes
Landform: Low hills
Parent material: Eolian deposits and alluvium derived from sandstone and shale
Slope: 2 to 7 percent

Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.8 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 55 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Limy
Potential native vegetation: Blue grama, sideoats grama, black grama, hairy grama, sand dropseed
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 10 inches; fine sandy loam
Bk1, Bk2—10 to 60 inches; sandy clay loam

Redona soils

Landscape: Piedmont slopes
Landform: Pediments
Parent material: Red bed eolian and alluvium derived from sandstone and shale
Slope: 2 to 5 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 10.3 inches (high)
Shrink-swell potential: About 4.4 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Sandy Loam
Potential native vegetation: Blue grama, little bluestem, sideoats grama, black grama, dropseed
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 6 inches; fine sandy loam
Bt, Btk, Bk—6 to 60 inches; sandy clay loam

Minor Components

Soils shallow to petrocalcic and similar soils
Composition: About 10 percent
Slope: 0 to 5 percent
Depth to restrictive feature: 9 to 20 inches to petrocalcic
Drainage class: Well drained
Ecological site: Shallow

61—Berwolf-Roswell association, 1 to 15 percent slopes

Map Unit Setting

Major land resource area: 70
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Berwolf and similar soils: 60 percent
Roswell and similar soils: 20 percent
Minor components: 20 percent

Component Descriptions

Berwolf soils

Landscape: Dune fields
Landform: Interdunes
Parent material: Eolian deposits derived from sandstone and shale
Slope: 1 to 5 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 7.5 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Sandy Plains
Potential native vegetation: Dropseed, little bluestem, sand bluestem, New Mexico feathergrass, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 11 inches; loamy fine sand
Bt1, Bt2—11 to 42 inches; sandy loam
Bk1, Bk2—42 to 60 inches; fine sandy loam

Roswell soils

Landscape: Dune fields
Landform: Dunes
Parent material: Eolian sands derived from sandstone and shale
Slope: 5 to 15 percent
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 4.6 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low

Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Sandhills
Potential native vegetation: Sand bluestem, dropseed, giant sandreed, little bluestem, sand sagebrush
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 8 inches; fine sand
C—8 to 60 inches; fine sand

Minor Components

Soils shallow to petrocalcic and similar soils
Composition: About 10 percent
Slope: 0 to 5 percent
Depth to restrictive feature: 9 to 20 inches to petrocalcic
Drainage class: Well drained
Ecological site: Shallow
Berwolf and similar soils
Composition: About 10 percent
Slope: 0 to 5 percent
Drainage class: Well drained
Ecological site: Sandy Plains

AcA—Acuff loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Acuff and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Acuff soils

Landscape: Tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 9.9 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 40 percent

Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Deep Hardland PE 25-36
Potential native vegetation: Blue grama, buffalograss, galleta, sideoats grama, western wheatgrass
Land capability subclass (irrigated): 1
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap1—0 to 9 inches; loam
Bt1—9 to 16 inches; clay loam
Bt2—16 to 33 inches; clay loam
Btk1—33 to 80 inches; clay loam

Minor Components

Estacado and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36
Olton and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

AcB—Acuff loam, 1 to 3 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Acuff and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Acuff soils

Landscape: Tablelands
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Slope: 1 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 9.9 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low

Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Deep Hardland PE 25-36
Potential native vegetation: Blue grama, buffalograss, galleta, sideoats grama, western wheatgrass
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap1 and Ap2—0 to 7 inches; loam
Bt1 and Bt2—7 to 33 inches; clay loam
Btk1 and Bk—33 to 80 inches; clay loam

Minor Components

Olton and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36
Estacado and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36

AfA—Amarillo fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Amarillo and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Amarillo soils

Landscape: Tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 9.2 inches (high)
Shrink-swell potential: About 1.5 percent (low)

Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Sandy Loam PE 25-36
Potential native vegetation: Blue grama, sideoats grama, black grama, hairy grama, little bluestem
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap1—0 to 9 inches; fine sandy loam
Bt1 and Bt2—9 to 42 inches; sandy clay loam
Btk—42 to 80 inches; clay loam

Minor Components

Spantara and similar soils
Composition: About 8 percent
Slope: 1 to 5 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36
Gomez and similar soils
Composition: About 7 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36

AfB—Amarillo fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Amarillo and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Amarillo soils

Landscape: Tablelands
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Slope: 1 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.9 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)

Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Sandy Loam PE 25-36
Potential native vegetation: Blue grama, sideoats grama, black grama, hairy grama, little bluestem
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap—0 to 10 inches; fine sandy loam
Bt—10 to 35 inches; sandy clay loam
Btk—35 to 80 inches; sandy clay loam

Minor Components

Spantara and similar soils
Composition: About 8 percent
Slope: 1 to 5 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36
Gomez and similar soils
Composition: About 7 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36

AnB—Amarillo loamy fine sand, 1 to 3 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Amarillo and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Amarillo soils

Landscape: Tablelands
Landform: Plains, playa slopes (fig. 1)
Parent material: Loamy eolian deposits
Slope: 1 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.8 inches (moderate)

Figure 1.—Irrigated grain sorghum on an area of Amarillo loamy fine sand, 1 to 3 percent slopes. The irrigated crop provides wind erosion protection during the growing season and as a residue when left on the surface.

Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Sandy PE 25-36
Potential native vegetation: Little bluestem, sand bluestem, sand dropseed, sand sagebrush, sideoats grama
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap—0 to 7 inches; loamy fine sand
Bt1 and Bt2—7 to 37 inches; sandy clay loam and loam
Btk—37 to 80 inches; clay loam

Minor Components

Spantara and similar soils
Composition: About 8 percent
Slope: 1 to 5 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36

Gomez and similar soils
Composition: About 7 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36

AvA—Arvana fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Arvana and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Arvana soils

Landscape: Tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 1 percent
Depth class: Moderately deep
Depth to restrictive feature: 20 to 40 inches to petrocalcic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 4.8 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: About 3 percent
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Sandy Loam PE 25-36
Potential native vegetation: Black grama, blue grama, sideoats grama, buffalograss, hairy grama
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6e

Typical Profile

Ap—0 to 8 inches; fine sandy loam
Bt1—8 to 17 inches; clay loam
Bt2—17 to 31 inches; sandy clay loam
Bkm—31 to 35 inches; cemented material
BCk—35 to 80 inches; clay loam

Minor Components

Amarillo and similar soils
Composition: About 14 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Sandy Loam PE 25-36
Milsand and similar soils
Composition: About 1 percent
Slope: 5 to 20 percent
Drainage class: Excessively drained
Ecological site: Sand Hills PE 25-36

BcA—Bippus clay loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Bippus and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Bippus soils

Landscape: Tablelands
Landform: Draws, flood plains
Parent material: Loamy alluvium
Slope: 0 to 2 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 10.8 inches (high)
Shrink-swell potential: About 4.1 percent (moderate)
Flooding hazard: Rare—during the months of April to October
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: About 3 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Draw PE 25-36
Potential native vegetation: Western wheatgrass, blue grama, galleta, sideoats grama, vine mesquite
Land capability subclass (irrigated): 2w
Land capability subclass (nonirrigated): 4c

Typical Profile

A1, A2—0 to 13 inches; clay loam
Bw1—13 to 23 inches; clay loam
Bw2—23 to 80 inches; clay loam

Minor Components

Acuff and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36
Olton and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36
Portales and similar soils
Composition: About 4 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36
Randall and similar soils
Composition: About 1 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Playa PE 25-36

DRC—Drake soils, 1 to 8 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Drake and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Drake soils

Landscape: Tablelands
Landform: Dunes
Parent material: Loamy eolian deposits
Slope: 1 to 8 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.5 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium

Calcium carbonate average in horizon of maximum accumulation: About 16 percent
Gypsum average in horizon of maximum accumulation: About 2 percent
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 7 (slightly sodic)
Ecological site: High Lime PE 25-36
Potential native vegetation: Alkali sacaton, black grama, blue grama, fourwing saltbush, sideoats grama
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 7 inches; loam
Bk1—7 to 28 inches; sandy clay loam
Bk2—28 to 55 inches; loam
Bk3—55 to 80 inches; fine sandy loam

Minor Components

Spantara and similar soils
Composition: About 5 percent
Slope: 1 to 5 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36
Portales and similar soils
Composition: About 5 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36

EsA—Estacado loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Estacado and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Estacado soils

Landscape: Tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 10.8 inches (high)
Shrink-swell potential: About 3.6 percent (moderate)

Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 30 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (slightly sodic)
Ecological site: Limy Upland PE 25-36
Potential native vegetation: Blue grama, sideoats grama, black grama, buffalograss, hairy grama
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap and Ap2—0 to 11 inches; loam
Btk1—11 to 20 inches; clay loam
Btk2—20 to 80 inches; clay loam

Minor Components

Posey and similar soils
Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36

Acuff and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

EsB—Estacado loam, 1 to 3 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Estacado and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Estacado soils

Landscape: Tablelands
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Slope: 1 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)

Available water capacity: About 10.7 inches (high)
Shrink-swell potential: About 3.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 35 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Limy Upland PE 25-36
Potential native vegetation: Blue grama, sideoats grama, black grama, buffalograss, hairy grama
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap—0 to 13 inches; loam
Btk1—13 to 22 inches; clay loam
Btk2—22 to 30 inches; clay loam
Btk3—30 to 80 inches; clay loam

Minor Components

Acuff and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36
Bippus and similar soils
Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Flooding hazard: Rare
Ecological site: Draw PE 25-36
Kimberson and similar soils
Composition: About 5 percent
Slope: 1 to 5 percent
Depth to restrictive feature: 10 to 20 inches to petrocalcic
Drainage class: Well drained
Ecological site: Very Shallow PE 25-36

FrA—Friona loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Friona and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Friona soils

Landscape: Tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 1 percent
Depth class: Moderately deep
Depth to restrictive feature: 20 to 40 inches to petrocalcic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 5.4 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 35 percent
Gypsum average in horizon of maximum accumulation: About 2 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Deep Hardland PE 25-36
Potential native vegetation: **B**lue grama, buffalograss, galleta, sideoats grama, western wheatgrass
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap—0 to 6 inches; loam
Bt1, Bt2—6 to 24 inches; clay loam
Btk—24 to 30 inches; clay loam
Bkm—30 to 41 inches; cemented material
Bk—41 to 80 inches; sandy clay loam

Minor Components

Acuff and similar soils
Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36
Arvana and similar soils
Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Sandy Loam PE 25-36

GoB—Gomez loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Gomez and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Gomez soils

Landscape: Tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.7 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 3 (slightly sodic)
Ecological site: Sandy PE 25-36
Potential native vegetation: Little bluestem, sand bluestem, sand dropseed, sand sagebrush, sideoats grama
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4e

Typical Profile

A—0 to 12 inches; loamy fine sand
Bk1—12 to 20 inches; fine sandy loam
Bk2—20 to 23 inches; loam
Bk3—23 to 47 inches; loamy fine sand
C—47 to 80 inches; loamy fine sand

Minor Components

Spantara and similar soils
Composition: About 10 percent
Slope: 1 to 5 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36

Acuff and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

GrA—Grier clay loam, 0 to 2 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)

Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Grier and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Grier soils

Landscape: Tablelands
Landform: Playa floors, pluvial lakes (relict), basin floors
Parent material: Clayey lacustrine deposits
Slope: 0 to 2 percent
Depth class: Very deep
Drainage class: Somewhat poorly drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 10.5 inches (high)
Shrink-swell potential: About 6.6 percent (high)
Ponding hazard: Frequent—during the months of September and October; Occasional—during the months of April to August
Seasonal high water table depth: About 9 to 36 inches
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 30 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 6 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 15 (moderately sodic)
Ecological site: Wet Saline PE 25-36
Potential native vegetation: Alkali sacaton, mat muhly, inland saltgrass, vine mesquite, western wheatgrass
Land capability subclass (nonirrigated): 5w

Typical Profile

A—0 to 4 inches; clay loam
Bw1, Bw2—4 to 18 inches; clay loam
Bgk1, Bgk2—18 to 35 inches; sandy clay loam
Bgk3, Bgk4—35 to 80 inches; clay loam

Minor Components

Drake and similar soils
Composition: About 5 percent
Slope: 1 to 9 percent
Drainage class: Well drained
Ecological site: High Lime PE 25-36

Portales and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36

KmB—Kimberson gravelly loam, 0 to 3 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Kimberson and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Kimberson soils

Landscape: Tablelands
Landform: Plains, low hills
Parent material: Loamy eolian deposits
Slope: 0 to 3 percent
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to petrocalcic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.0 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 50 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Very Shallow PE 25-36
Potential native vegetation: Black grama, sideoats grama, cane bluestem, hairy grama, threeawn
Land capability subclass (nonirrigated): 7s

Typical Profile

A1—0 to 5 inches; gravelly loam
A2—5 to 14 inches; gravelly loam
Bkm—14 to 20 inches; cemented material
BCk—20 to 80 inches; gravelly loam

Minor Components

Pep and similar soils
Composition: About 5 percent
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36

Acuff and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

LcA—Lazbuddie clay, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Lazbuddie and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Lazbuddie soils

Landscape: Tablelands
Landform: Playa steps
Parent material: Clayey lacustrine deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Moderately well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 8.9 inches (moderate)
Shrink-swell potential: About 7.5 percent (high)
Ponding hazard: Rare
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 12 percent
Gypsum average in horizon of maximum accumulation: About 3 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Playa PE 25-36
Potential native vegetation: Pennsylvania smartweed, blue grama, buffalograss, common spikerush, western wheatgrass
Land capability subclass (nonirrigated): 5w

Typical Profile

A—0 to 10 inches; clay
Bss1, Bss2—10 to 45 inches; clay
Bss3—45 to 80 inches; clay

Minor Components

McLean and similar soils
Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained

Ecological site: Playa PE 25-36
Randall and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Playa PE 25-36

LoA—Lofton clay loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Lofton and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Lofton soils

Landscape: Tablelands
Landform: Depressions
Parent material: Clayey eolian deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Moderately well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 10.4 inches (high)
Shrink-swell potential: About 5.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 28 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Deep Hardland PE 25-36
Potential native vegetation: Blue grama, buffalograss, galleta, sideoats grama, western wheatgrass
Land capability subclass (irrigated): 1
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 6 inches; clay loam
Bt1, Bt2—6 to 25 inches; silty clay
Btk, Bk—25 to 80 inches; clay loam

Minor Components

Olton and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent

Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36
Lazbuddie and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Playa PE 25-36
McLean and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Playa PE 25-36

McA—McLean clay, 0 to 1 percent slopes, occasionally ponded

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

McLean and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

McLean soils

Landscape: Tablelands
Landform: Playa floors
Parent material: Clayey lacustrine deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Somewhat poorly drained
Slowest permeability: 0.00 to 0.06 in/hr (very slow)
Available water capacity: About 8.5 inches (moderate)
Shrink-swell potential: About 17.0 percent (very high)
Ponding hazard: Occasional—during the months of April to October
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Playa PE 25-36
Potential native vegetation: Pennsylvania smartweed, blue grama, buffalograss, common spikerush, western wheatgrass
Land capability subclass (nonirrigated): 4w

Typical Profile

A—0 to 6 inches; clay
Bss1, Bss2—6 to 41 inches; clay
Bkss1—41 to 61 inches; clay
Bkss2, Bkss3—61 to 80 inches; clay

Minor Components

Portales and similar soils
Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36

MsD—Milsand loamy fine sand, 1 to 8 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,420 feet (1,250 to 1,651 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Milsand and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Milsand soils

Landscape: Tablelands
Landform: Dunes
Parent material: Sandy eolian deposits
Slope: 1 to 8 percent
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 3.0 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Sand Hills PE 25-36
Potential native vegetation: Havard's oak, sand bluestem, little bluestem, sand sagebrush, giant sandreed, sideoats grama, spike dropseed
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 6 inches; loamy fine sand
Ck1—6 to 30 inches; loamy fine sand
Ck2—30 to 80 inches; fine sand

Minor Components

Arch and similar soils
Composition: About 5 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: High Lime PE 25 - 36
Spantara and similar soils
Composition: About 5 percent
Slope: 1 to 5 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36
Gomez and similar soils
Composition: About 5 percent
Slope: 1 to 5 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36

MsE—Milsand-Arch complex, 1 to 20 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Milsand and similar soils: 50 percent
Arch and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Milsand soils

Landscape: Tablelands
Landform: Dunes
Parent material: Sandy eolian deposits
Slope: 1 to 20 percent
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)

Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Sand Hills PE 25-36
Potential native vegetation: Little bluestem, sand bluestem, sand dropseed, sand lovegrass, sideoats grama
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 8 inches; fine sand
C—8 to 30 inches; fine sand
Ab—30 to 37 inches; fine sand
Cb—37 to 80 inches; fine sand

Arch soils

Landscape: Tablelands
Landform: Interdunes
Parent material: Loamy eolian deposits
Slope: 1 to 10 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.5 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 50 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: High Lime PE 25-36
Potential native vegetation: Alkali sacaton, black grama, blue grama, fourwing saltbush, sideoats grama
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 6 inches; fine sandy loam
Bk1—6 to 16 inches; sandy clay loam
Bk2—16 to 37 inches; sandy clay loam
Bk3—37 to 80 inches; sandy clay loam

Minor Components

Spantara and similar soils
Composition: About 10 percent
Slope: 1 to 5 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36

NtC—Nutivoli fine sand, 3 to 8 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)

Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Nutivoli and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Nutivoli soils

Landscape: Tablelands
Landform: Dunes (fig. 2)
Parent material: Eolian sands
Slope: 3 to 8 percent
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 4.7 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None

Figure 2.—Native rangeland on an area of Nutivoli fine sand, 3 to 8 percent slopes. The Nutivoli soils are in the Sand Hills ecological site.

Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Sand Hills PE 25-36
Potential native vegetation: Little bluestem, sand bluestem, sand dropseed, sand lovegrass, sideoats grama
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 6 inches; fine sand
C1, C2, C3, C4—6 to 80 inches; fine sand

Minor Components

Milsand and similar soils
Composition: About 5 percent
Slope: 5 to 20 percent
Drainage class: Excessively drained
Ecological site: Sand Hills PE 25-36
Spantara and similar soils
Composition: About 5 percent
Slope: 1 to 5 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36

NtD—Nutivoli fine sand, 5 to 12 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Nutivoli and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Nutivoli soils

Landscape: Tablelands
Landform: Dunes
Parent material: Eolian sands
Slope: 5 to 12 percent
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 4.4 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)

Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Sand Hills PE 25-36
Potential native vegetation: Little bluestem, sand bluestem, sand dropseed, sand lovegrass, sideoats grama
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 28 inches; fine sand
C1, C2, C3—28 to 80 inches; fine sand

Minor Components

Gomez and similar soils
Composition: About 5 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36
Milsand and similar soils
Composition: About 5 percent
Slope: 5 to 20 percent
Drainage class: Excessively drained
Ecological site: Sand Hills PE 25-36
Amarillo and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Sandy Loam PE 25-36

OcA—Olton clay loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Olton and similar soils: 95 percent
Minor components: 5 percent

Component Descriptions

Olton soils

Landscape: Tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.0 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Negligible

Calcium carbonate average in horizon of maximum accumulation: About 35 percent
Gypsum average in horizon of maximum accumulation: About 2 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Deep Hardland PE 25-36
Potential native vegetation: Blue grama, buffalograss, galleta, sideoats grama, western wheatgrass
Land capability subclass (irrigated): 2s
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap—0 to 6 inches; clay loam
Bt—6 to 17 inches; clay
Btk1, Btk2, Btk3—17 to 41 inches; clay loam
Btk4, Btk5—41 to 80 inches; clay loam

Minor Components

Slaughter and similar soils
Composition: About 5 percent
Slope: 0 to 2 percent
Depth to restrictive feature: 9 to 20 inches to petrocalcic
Drainage class: Well drained
Ecological site: Very Shallow PE 25-36

OcB—Olton clay loam, 1 to 3 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Olton and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Olton soils

Landscape: Tablelands
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Slope: 1 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.5 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 35 percent
Gypsum average in horizon of maximum accumulation: None

Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Deep Hardland PE 25-36
Potential native vegetation: Blue grama, buffalograss, galleta, sideoats grama, western wheatgrass
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap1, Ap2—0 to 9 inches; clay loam
Bt1, Bt2—9 to 25 inches; clay
Btk1—25 to 34 inches; clay loam
Btk2—34 to 80 inches; clay loam

Minor Components

Acuff and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36
Estacado and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36
Kimberson and similar soils
Composition: About 5 percent
Slope: 0 to 2 percent
Depth to restrictive feature: 9 to 20 inches to petrocalcic
Drainage class: Well drained
Ecological site: Very Shallow PE 25-36

PcA—Pep clay loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Pep and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Pep soils

Landscape: Plateaus or tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 1 percent
Depth class: Very deep

Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.9 inches (moderate)
Shrink-swell potential: About 3.0 percent (moderate)
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Limy Upland PE 25-36
Potential native vegetation: Blue grama, sideoats grama, buffalograss, black grama, hairy grama, sand dropseed, threeawn, vine mesquite
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap—0 to 10 inches; clay loam
Bw1—10 to 16 inches; clay loam
Bw2—16 to 32 inches; clay loam
Bk—32 to 80 inches; clay loam

Minor Components

Estacado and similar soils
Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36
Olton and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

PcB—Pep clay loam, 1 to 3 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Pep and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Pep soils

Landscape: Plateaus or tablelands
Landform: Playa slopes, plains
Parent material: Loamy eolian deposits

Slope: 1 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.9 inches (moderate)
Shrink-swell potential: About 3.0 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Limy Upland PE 25-36
Potential native vegetation: Blue grama, sideoats grama, buffalograss, black grama, hairy grama, sand dropseed, threeawn, vine mesquite
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap—0 to 9 inches; clay loam
Bw1—9 to 15 inches; clay loam
Bw2—15 to 31 inches; clay loam
Bk—31 to 80 inches; clay loam

Minor Components

Estacado and similar soils
Composition: About 10 percent
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36
Olton and similar soils
Composition: About 5 percent
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

PeA—Pep loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Pep and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Pep soils

Landscape: Tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 10.9 inches (high)
Shrink-swell potential: About 4.3 percent (moderate)
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 33 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Limy Upland PE 25-36
Potential native vegetation: Blue grama, sideoats grama, black grama, buffalograss, hairy grama
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap—0 to 7 inches; loam
Bw1, Bw2—7 to 20 inches; clay loam
Bk1, Bk2—20 to 80 inches; clay loam

Minor Components

Estacado and similar soils
Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36

Olton and similar soils
Composition: About 5 percent
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

PeB—Pep loam, 1 to 3 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Pep and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Pep soils

Landscape: Tablelands
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Slope: 1 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.2 inches (high)
Shrink-swell potential: About 3.1 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 33 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Limy Upland PE 25-36
Potential native vegetation: Blue grama, sideoats grama, black grama, buffalograss, hairy grama
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4c

Typical Profile

A1, A2—0 to 14 inches; loam
Bw—14 to 30 inches; loam
Bk1, Bk2—30 to 80 inches; clay loam

Minor Components

Estacado and similar soils
Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36

PMG—Potter-Mobeetie association, 8 to 45 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Potter and similar soils: 45 percent

Mobeetie and similar soils: 35 percent
Minor components: 20 percent

Component Descriptions

Potter soils

Landscape: Breaks
Landform: Ridges, scarp slopes
Parent material: Loamy alluvium
Slope: 8 to 30 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 4.2 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 65 percent
Gypsum average in horizon of maximum accumulation: About 3 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Very Shallow PE 25-36
Potential native vegetation: Little bluestem, sideoats grama, black grama, blue grama, New Mexico feathergrass, hairy grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 4 inches; loam
Bk—4 to 9 inches; gravelly loam
BCk and C—9 to 80 inches; gravelly loam and extremely cobbly loam

Mobeetie soils

Landscape: Breaks
Landform: Valley sides, scarp slopes
Parent material: Loamy colluvium
Slope: 8 to 45 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.7 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 13 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Mixedland Slopes PE 25-36
Potential native vegetation: Little bluestem, blue grama, sideoats grama, black grama, New Mexico feathergrass, hairy grama
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 12 inches; fine sandy loam
Bw—12 to 16 inches; fine sandy loam
Bk1, Bk2—16 to 80 inches; fine sandy loam

Minor Components

Bippus and similar soils
Composition: About 10 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Flooding hazard: Rare
Ecological site: Draw PE 25-36
Kimberson and similar soils
Composition: About 5 percent
Slope: 1 to 5 percent
Depth to restrictive feature: 10 to 20 inches to petrocalcic
Drainage class: Well drained
Ecological site: Very Shallow PE 25-36
Estacado and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36

PoA—Portales loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Portales and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Portales soils

Landscape: Tablelands
Landform: Plains, playa steps
Parent material: Loamy eolian deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 10.9 inches (high)
Shrink-swell potential: About 3.9 percent (moderate)
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 28 percent
Gypsum average in horizon of maximum accumulation: None

Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Limy Upland PE 25-36
Potential native vegetation: Blue grama, sideoats grama, black grama, buffalograss, hairy grama
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 15 inches; loam
Bk1—15 to 35 inches; clay loam
Bk2, Bk3, Bk4—35 to 80 inches; loam and clay loam

Minor Components

Acuff and similar soils
Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

PsA—Posey fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Posey and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Posey soils

Landscape: Tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 9.6 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)

Ecological site: Limy Upland PE 25-36
Potential native vegetation: Blue grama, sideoats grama, black grama, buffalograss, hairy grama
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap1, Ap2—0 to 11 inches; fine sandy loam
Btk1—11 to 17 inches; sandy clay loam
Btk2—17 to 42 inches; sandy clay loam
Btk3—42 to 80 inches; sandy clay loam

Minor Components

Amarillo and similar soils
Composition: About 5 percent
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Sandy Loam PE 25-36
Estacado and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Limy Upland PE 25-36
Gomez and similar soils
Composition: About 5 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36

PsB—Posey fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Posey and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Posey soils

Landscape: Tablelands
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Slope: 1 to 3 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 9.7 inches (high)
Shrink-swell potential: About 1.5 percent (low)

Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: About 3 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Limy Upland PE 25-36
Potential native vegetation: Blue grama, sideoats grama, black grama, buffalograss, hairy grama
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4c

Typical Profile

Ap—0 to 6 inches; fine sandy loam
Btk1—6 to 13 inches; clay loam
Btk2—13 to 52 inches; clay loam
Btk3—52 to 80 inches; clay loam

Minor Components

Amarillo and similar soils
Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Sandy Loam PE 25-36

PsC—Posey fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Posey and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Posey soils

Landscape: Tablelands
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Slope: 3 to 8 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 9.5 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: None

Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Limy Upland PE 25-36
Potential native vegetation: Blue grama, sideoats grama, black grama, buffalograss, hairy grama
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile

A—0 to 12 inches; fine sandy loam
Btk1—12 to 22 inches; clay loam
Btk2—22 to 38 inches; clay loam
Btk3—38 to 80 inches; sandy clay loam

Minor Components

Amarillo and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Sandy Loam PE 25-36
Kimberson and similar soils
Composition: About 5 percent
Slope: 1 to 5 percent
Depth to restrictive feature: 10 to 20 inches to petrocalcic
Drainage class: Well drained
Ecological site: Very Shallow PE 25-36

RaA—Randall clay, 0 to 1 percent slopes, frequently ponded

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Randall and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Randall soils

Landscape: Tablelands
Landform: Playa floors (fig. 3)
Parent material: Clayey lacustrine deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Poorly drained
Slowest permeability: 0.00 to 0.06 in/hr (very slow)
Available water capacity: About 8.2 inches (moderate)
Shrink-swell potential: About 18.0 percent (very high)

Figure 3.—This playa lake is in an area of Randall clay, 0 to 1 percent slopes, frequently ponded. The large playa lakes provide seasonal habitat for migratory waterfowl.

Ponding hazard: Frequent—during months of April to October
Seasonal high water table depth: None to 6 inches during the months of May, June, September, and October; 12 to 18 inches during the months of April, May, and November
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Playa PE 25-36
Potential native vegetation: Pennsylvania smartweed, blue grama, buffalograss, common spikerush, western wheatgrass
Land capability subclass (nonirrigated): 6w

Typical Profile

A1, A2—0 to 17 inches; clay
Bss1—17 to 28 inches; clay
Bss2, Bss3—28 to 80 inches; clay

Minor Components

Lofton and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent

Drainage class: Moderately well drained
Ecological site: Deep Hardland PE 25-36
McLean and similar soils
Composition: About 5 percent
Drainage class: Somewhat poorly drained
Ecological site: Playa PE 25-36

RcA—Ranco clay, 0 to 1 percent slopes, frequently ponded

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Ranco and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Ranco soils

Landscape: Tablelands
Landform: Playa floors
Parent material: Clayey lacustrine deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Poorly drained
Slowest permeability: 0.00 to 0.06 in/hr (very slow)
Available water capacity: About 7.9 inches (moderate)
Shrink-swell potential: About 17.0 percent (very high)
Ponding hazard: Frequent—during months of April to October
Seasonal high water table depth: None to 6 inches during the months of May, June, September, and October; 12 to 18 inches during the months of April, May, and November
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Playa PE 25-36
Potential native vegetation: Pennsylvania smartweed, blue grama, buffalograss, common spikerush, western wheatgrass
Land capability subclass (nonirrigated): 6w

Typical Profile

A—0 to 5 inches; clay
Bw—5 to 12 inches; clay
Bss1, Bss2—12 to 80 inches; clay

Minor Components

Sparenberg and similar soils
Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Moderately well drained
Ecological site: Playa PE 25-36

SaA—Slaughter loam, 0 to 2 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Slaughter and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Slaughter soils

Landscape: Tablelands
Landform: Plains, low hills
Parent material: Loamy eolian deposits
Slope: 0 to 2 percent
Depth class: Very shallow and shallow
Depth to restrictive feature: 9 to 20 inches to petrocalcic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.2 inches (low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 35 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Very Shallow PE 25-36
Potential native vegetation: Black grama, sideoats grama, cane bluestem, hairy grama, threeawn
Land capability subclass (irrigated): 4s
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 6 inches; loam
Bt1, Bt2—6 to 18 inches; clay loam
Bkm—18 to 30 inches; cemented material
BCk—30 to 80 inches; sandy clay loam

Minor Components

Sparks and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

Friona and similar soils
Composition: About 5 percent
Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to petrocalcic
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

Acuff and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36

SnC—Spantara fine sand, 1 to 5 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Spantara and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Spantara soils

Landscape: Tablelands
Landform: Plains, playa slopes
Parent material: Coarse-loamy eolian deposits
Slope: 1 to 5 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.8 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: None (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Sandy PE 25-36
Potential native vegetation: Little bluestem, sand bluestem, sand dropseed, sand sagebrush, sideoats grama

Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4e

Typical Profile

A1, A2—0 to 10 inches; fine sand
Bt1, Bt2, Bt3, Bt4—10 to 45 inches; fine sand, loamy fine sand, fine sandy loam
Bt5—45 to 80 inches; loamy fine sand

Minor Components

Nutivoli and similar soils
Composition: About 10 percent
Slope: 1 to 9 percent
Drainage class: Excessively drained
Ecological site: Sand Hills PE 25-36
Gomez and similar soils
Composition: About 5 percent
Slope: 0 to 3 percent
Drainage class: Well drained
Ecological site: Sandy PE 25-36

SpA—Sparenberg clay, 0 to 1 percent slopes, occasionally ponded

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Sparenberg and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Sparenberg soils

Landscape: Tablelands
Landform: Playa floors
Parent material: Clayey lacustrine deposits
Slope: 0 to 1 percent
Depth class: Very deep
Drainage class: Somewhat poorly drained
Slowest permeability: 0.00 to 0.06 in/hr (very slow)
Available water capacity: About 7.9 inches (moderate)
Shrink-swell potential: About 17.0 percent (very high)
Ponding hazard: Occasional—during months of April to October
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)

Ecological site: Playa PE 25-36
Potential native vegetation: Pennsylvania smartweed, blue grama, buffalograss, common spikerush, western wheatgrass
Land capability subclass (nonirrigated): 4w

Typical Profile

A—0 to 4 inches; clay
Bw—4 to 12 inches; clay
Bss—12 to 46 inches; clay
Bkss—46 to 80 inches; clay

Minor Components

Lofton and similar soils
Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Moderately well drained
Ecological site: Deep Hardland PE 25-36

SsA—Sparks loam, 0 to 2 percent slopes

Map Unit Setting

Major land resource area: 77
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Frost-free period: 180 to 200 days

Map Unit Composition

Sparks and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Sparks soils

Landscape: Tablelands
Landform: Plains
Parent material: Loamy eolian deposits
Slope: 0 to 2 percent
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 11.3 inches (high)
Shrink-swell potential: About 4.4 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: None (nonsodic)
Ecological site: Deep Hardland PE 25-36
Potential native vegetation: Blue grama, buffalograss, galleta, sideoats grama, western wheatgrass

Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 6 inches; loam
Bt1—6 to 18 inches; clay
Bt2, Btk—18 to 80 inches; clay loam

Minor Components

Acuff and similar soils
Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36
Friona and similar soils
Composition: About 5 percent
Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to petrocalcic
Drainage class: Well drained
Ecological site: Deep Hardland PE 25-36
Slaughter and similar soils
Composition: About 5 percent
Slope: 0 to 2 percent
Depth to restrictive feature: 9 to 20 inches to petrocalcic
Drainage class: Well drained
Ecological site: Very Shallow PE 25-36

W—Water

This map unit consists of areas of natural or constructed bodies of surface water. No interpretations are assigned to this map unit.

Prime Farmland

The list below lists the map units in the survey area that are considered prime farmland. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of prime farmland, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland (fig. 4) is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of

Figure 4.—Center pivot irrigation on an area of Acuff loam, 0 to 1 percent slopes. This soil is classified as Prime Farmland when irrigated.

moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

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

For some soils identified in the list as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

AcA—Acuff loam, 0 to 1 percent slopes	Prime Farmland when irrigated
AcB—Acuff loam, 1 to 3 percent slopes	Prime Farmland when irrigated
FrA—Friona loam, 0 to 1 percent slopes	Prime Farmland when irrigated
LoA—Lofton clay loam, 0 to 1 percent slopes	Prime Farmland when irrigated
OcA—Olton clay loam, 0 to 1 percent slopes	Prime Farmland when irrigated
OcB—Olton clay loam, 1 to 3 percent slopes	Prime Farmland when irrigated
SsA—Sparks loam, 0 to 2 percent slopes	Prime Farmland when irrigated

Use and Management of the Soils

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

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

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

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

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

Interpretive Ratings

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

Rating Class Terms

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

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation.

The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in Table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

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

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

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

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

Crops other than those shown in Table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or the New Mexico Cooperative Extension can provide information about the management and productivity of the soils for those crops. Other information is available on the Internet at http://soils.usda.gov.

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. (18)

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

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Table 6 shows, for each soil that supports rangeland vegetation, the ecological site and the potential annual production of vegetation in favorable, normal, and unfavorable years. An explanation of the column headings in the table follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service or on the Internet at http://soils.usda.gov.

Figure 5.—Native rangeland on an area of Acuff loam, 0 to 1 percent slopes. The Acuff soils are in the Deep Hardland ecological site.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in the "National Range and Pasture Handbook," (16), available in local offices of the Natural Resources Conservation Service or on the Internet at http://soils.usda.gov.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, yards, fruit trees, gardens, and cropland from wind and snow; help to keep snow on fields; and provide food and cover for wildlife. Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Additional information on planning windbreaks, screens, and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service, the New Mexico Cooperative Extension, a commercial nursery, or on the Internet at http://soils.usda.gov.

Recreation

The soils of the survey area are rated in Table 7 and Table 8 according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 00.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in Table 7 and Table 8 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, In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

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 9 and Table 10 shows the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 00.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing.

Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils 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 11 and Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 00.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in down slope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Table 13 and Table 14 provides information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 13, 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 15 provides information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 00.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

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

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

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

Hydric Soils

The list below lists the map unit components that are rated as hydric soils in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site. (6,7)

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology. (3,7,14,15) Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to 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. (4) These soils, under natural conditions, 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. (5) These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (13) and "Keys to Soil Taxonomy" (11) and in the "Soil Survey Manual." (9)

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States." (6)

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2B3). Definitions for the codes are as follows:

- All Histels except for Folistels, and Histosols except for Folists.
- Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
    - are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
    - are poorly drained or very poorly drained and have either:
        - a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
        - a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
        - a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
- Soils that are frequently ponded for long or very long duration during the growing season.
- Soils that are frequently flooded for long or very long duration during the growing season.

GrA Grier clay loam, 0 to 2 percent slopes
RaA Randall clay, 0 to 1 percent slopes, frequently ponded
RcA Ranco clay, 0 to 1 percent slopes, frequently ponded

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

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

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

The estimates of soil properties are shown in tables. They include physical and chemical properties, and clay mineralogy.

Engineering Index Properties

Table 16 provides the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters across. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (2) and the system adopted by the American Association of State Highway and Transportation Officials. (1)

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to 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 17 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 17, 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 clay content affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

*Permeability (*K-sat*)* refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity *(*K-sat). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

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

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 17, 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 17 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 18 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

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 19 gives 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.

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 19 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 19 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

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

Soil Features

Table 20 gives 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.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

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.

Classification of the Soils

Soils are classified so that we can more easily remember significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their responses to manipulation. Through classification and then the use of soil maps, we can apply our knowledge of soils to specific areas.

The system of soil classification used by the National Cooperative Soil Survey has six categories. (10,13) Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. 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 Aridisol.

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 Argid (*Arg*, meaning presence of an argillic horizon, plus *id*, from Aridisol).

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 Calciargids (*Calci*, meaning a calcic horizon within 100 centimeters or 40 inches of the soil surface, plus *argid*, the suborder of the Aridisols that has an argillic horizon).

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 *Ustic* identifies the subgroup that typifies the great group. An example is Ustic Calciargids.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, thermic Ustic Calciargids.

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. The Redona series is an example of a fine-loamy, mixed, superactive, thermic Ustic Calciargid.

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" (9) and in the "Field Book for Describing and Sampling Soils." (8) Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (13) and in "Keys to Soil Taxonomy." (12) 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.

Acuff Series

Map unit(s): AcA, AcB
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 3 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Aridic Paleustolls

Typical Pedon

Map unit in which located: AcA, Acuff loam, 0 to 1 percent slopes
Location in survey area: Curry County, New Mexico; 100 feet east and 2,300 feet north of the southwest corner of section 33, T. 35 E., R. 5 N.; Latitude: 34 degrees 36 minutes 42 seconds N.; Longitude: 103 degrees 14 minutes 22 seconds W.

Ap1—0 to 4 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/3) moist; weak fine subangular blocky structure; hard, very friable, moderately sticky, moderately plastic; common fine and medium roots; few fine and medium interstitial and tubular pores; slightly alkaline; abrupt smooth boundary.

Ap2—4 to 7 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; weak fine subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; few very fine and medium roots; few very fine and medium pores; moderately alkaline; abrupt smooth boundary.

Bt1—7 to 14 inches; brown (7.5YR 4/2) clay loam; dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; few very fine roots; few fine and medium vesicular and tubular pores; common prominent continuous clay films on surfaces of peds and in pores; moderately alkaline; clear smooth boundary.

Bt2—14 to 33 inches; brown (7.5YR 4/4) clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, slightly sticky, slightly plastic; few very fine roots; few fine and medium pores; common prominent continuous clay films on faces of peds and in pores; few threads and masses of calcium carbonate in lower part; slightly effervescent; moderately alkaline; clear smooth wavy boundary.

Btk1—33 to 57 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; moderate medium subangular blocky structure; very hard, friable, slightly sticky, slightly plastic; few very fine roots; few fine and medium pores; many prominent continuous clay films on faces of peds and in pores; common threads and masses of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.

Btk2—57 to 80 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; moderate medium angular blocky structure; hard, friable, slightly sticky, slightly plastic; few fine roots; common fine and very fine pores; few prominent continuous clay films on faces of peds; many masses of calcium carbonate; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to secondary calcium carbonate: More than 20 inches
Depth to calcic horizon: 30 to 60 inches

A horizon:
Hue: 7.5YR or 10YR
Value: 3 or 4, 2 or 3 moist
Chroma: 2 or 3

Bt horizon:
Hue: 5YR or 7.5YR
Value: 3 to 5, 2 to 4 moist
Chroma: 2 to 4
Texture: Loam, sandy clay loam, or clay loam

Btk horizon:
Hue: 5YR or 7.5YR
Value: 6 to 8, 5 to 7 moist
Chroma: 4 to 6
Texture: Loam, sandy clay loam, or clay loam

Alama Series

Map unit(s): 36
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Alluvial flats
Parent material: Red bed alluvium derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 1 to 5 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-silty, mixed, superactive, thermic Ustic Haplocambids

Typical Pedon
(taken from the Guadalupe County, New Mexico Soil Survey Report)

Map unit in which located: 36, Alama silt loam, 1 to 5 percent slopes
Location in adjoining survey area: About 25 miles east of Santa Rosa, Guadalupe County, New Mexico, 200 feet north and 2,550 feet west of the southeast corner of section 15, T. 8 N., R. 26 E.; Latitude: 34 degrees 54 minutes 30 seconds N.; Longitude: 104 degrees 09 minutes 55 seconds W.

A—0 to 3 inches; reddish brown (5YR 5/4) silt loam, dark reddish brown (5YR ¾) moist; weak thin platy structure in the upper 0.5 inch, over moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many very fine and fine pores; common clusters of fine rounded wormcasts; slightly effervescent; moderately alkaline; clear smooth boundary.

Bw1—3 to 8 inches; reddish brown (5YR 5/4) silty clay loam, dark reddish brown (5YR 3/4) moist; weak coarse prismatic and moderate fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many fine roots; many very fine and fine pores; common clusters of fine rounded wormcasts; slightly effervescent; slightly alkaline; clear smooth boundary.

Bw2—8 to 18 inches; reddish brown (5YR 5/4) silty clay loam, dark reddish brown (5YR 3/4) moist; weak coarse prismatic and moderate fine subangular blocky structure; hard, friable, slightly sticky and plastic; many fine roots; many very fine and fine pores; few clusters of fine rounded wormcasts; strongly effervescent; slightly alkaline; gradual smooth boundary.

Bw3—18 to 28 inches; reddish brown (5YR 5/4) silt loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and plastic; common fine roots; common very fine and few fine pores; few clusters of fine rounded wormcasts; strongly effervescent; slightly alkaline; gradual smooth boundary.

Bk—28 to 40 inches; reddish yellow (5YR 6/6) silt loam, yellowish red (5YR 4/6) moist; weak coarse subangular blocky structure; hard, friable, slightly sticky and plastic; few fine roots; common very fine and few fine pores; calcium carbonate segregated in few fine masses and in seams; violently effervescent; moderately alkaline; gradual wavy boundary.

2Bk—40 to 60 inches; reddish yellow (5YR 6/6) loam, yellowish red (5YR 4/6) moist; weak coarse subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; few very fine and fine pores; calcium carbonate segregated in few fine concretions; strongly effervescent; moderately alkaline.

A horizon:
Hue: 2.5YR to 7.5YR
Value: 3 to 6, 3 or 4 moist
Chroma: 4 to 6

Bw, Bk, and 2Bk horizon:
Hue: 2.5YR to 7.5YR
Value: 3 to 7, 3 to 6 moist
Chroma: 3 to 6

Note: Some pedons have BCk or C horizons below 60 inches.

Amarillo Series

Map unit(s): AfA, AfB, AnB
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 3 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days

Taxonomic class: Fine-loamy, mixed, superactive, thermic Aridic Paleustalfs

Typical Pedon

Map unit in which located: AnB, Amarillo loamy fine sand, 1 to 3 percent slopes (fig. 6).
Location in survey area: Curry County, New Mexico; 100 feet south and 100 feet east from the northwest corner of section 20, T 3 N., R. 32 E.; Latitude: 34 degrees 26 minutes 26 seconds N.; Longitude: 103 degrees 35 minutes 11 seconds W.

Ap1—0 to 5 inches; reddish brown (5YR 5/4) loamy fine sand, yellowish red (5YR 5/6) moist; weak fine granular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; very slightly effervescent; slightly alkaline; abrupt smooth boundary.

Ap2—5 to 12 inches; reddish brown (5YR 5/4) loamy fine sand, yellowish red (5YR 5/6) moist; weak coarse angular blocky structure; hard, friable, nonsticky and nonplastic; common very fine, fine, and medium roots; very slightly effervescent; moderately alkaline; clear smooth boundary.

Bt1—12 to 16 inches; yellowish red (5YR 4/6) sandy clay loam, yellowish red (5YR 4/6) moist; weak coarse subangular blocky structure; hard, friable, nonsticky and nonplastic; few very fine, fine, and medium roots; few fine and medium pores; few faint clay films on faces of peds and in pores; very slightly effervescent; neutral; clear smooth boundary.

Bt2—16 to 22 inches; reddish brown (5YR 4/4) sandy clay loam, yellowish red (5YR 4/6) moist; moderate coarse subangular blocky structure; very hard, friable, nonsticky and nonplastic; few very fine, fine, and medium roots between peds; few fine and medium tubular pores; many prominent dark red (2.5YR 3/6) continuous clay films on faces of peds and in pores; very slightly effervescent; neutral; clear smooth boundary.

Bt3—22 to 34 inches; yellowish red (5YR 4/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate coarse subangular blocky structure; hard, friable, nonsticky and nonplastic; few very fine, fine, and medium roots; few fine and medium pores; many prominent continuous clay films on faces of peds and in pores; very slightly effervescent; strongly alkaline; abrupt smooth boundary.

Btk1—34 to 38 inches; pink (5YR 7/4) loam, light reddish brown (5YR 6/4) moist; weak fine subangular blocky structure; very hard, friable, slightly sticky and nonplastic; few very fine, fine, and medium roots; few fine and medium pores; common distinct discontinuous clay films on faces of peds, root channels, and pores; many rounded masses of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.

Btk2—38 to 57 inches; pink (7.5YR 7/4) clay loam, light reddish brown (5YR 7/4) moist; weak coarse subangular blocky structure; very hard, friable, slightly sticky and nonplastic; few very fine and medium roots; few very fine and medium pores; few distinct discontinuous clay films in root channels and pores; many rounded soft masses of calcium carbonate; violently effervescent; moderately alkaline.

Btk3—57 to 80 inches; pink (7.5YR 8/4) clay loam, pink (7.5YR 8/4) moist; weak coarse subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; few distinct discontinuous clay films in root channels and pores; many rounded soft masses of calcium carbonate; violently effervescent; strongly alkaline.

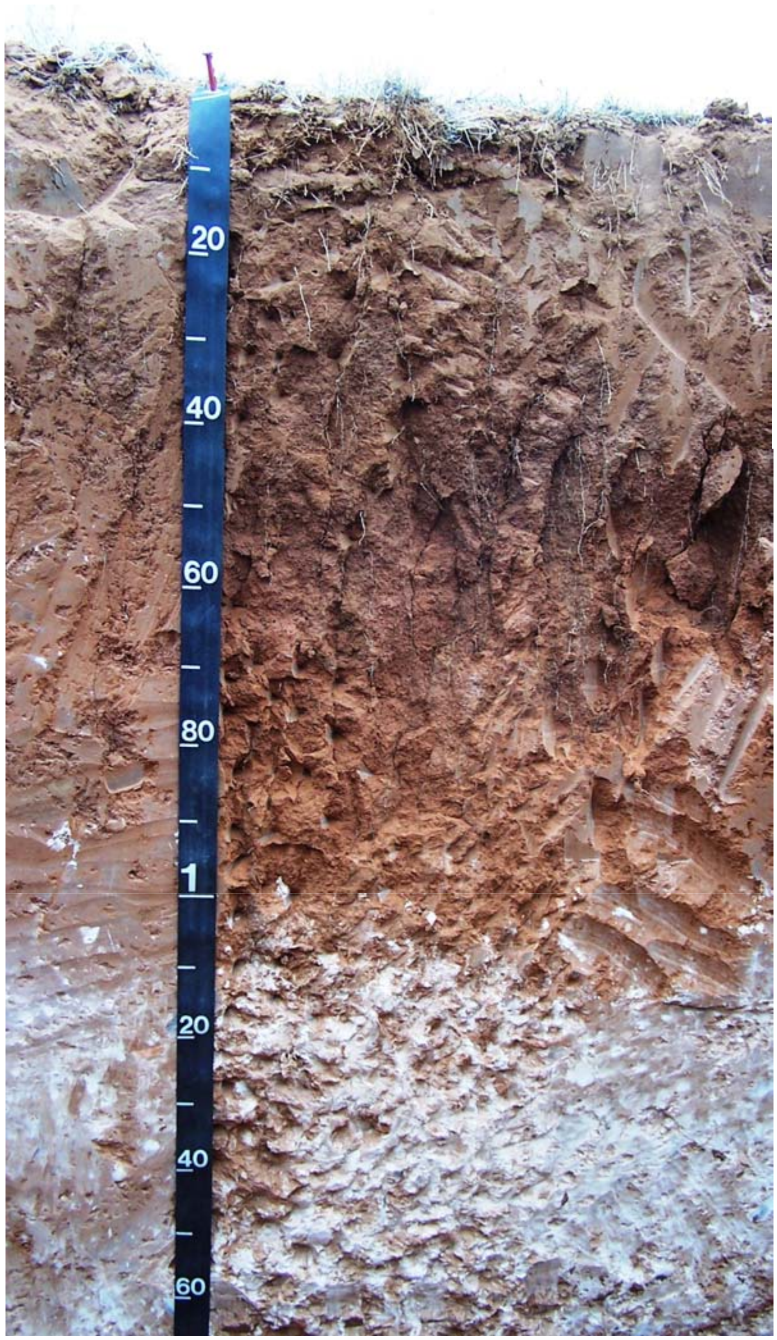

Figure 6.—A profile of Amarillo loamy fine sand, 1 to 3 percent slopes. The subsoil is a well developed soil with secondary accumulations of calcium carbonate (lime) beginning at about 110 cm.

Range in Characteristics

Depth to the calcic horizon: 30 to 60 inches

A horizon:
Hue: 5YR or 7.5YR
Value: 4 or 5, 3 or 4 moist

Chroma: 2 to 4
Texture: Loamy fine sand or fine sandy loam

Bt horizon:
Hue: 5YR or 7.5YR
Value: 4 or 5, 3 or 4 moist
Chroma: 2 to 6
Texture: Fine sandy loam, sandy clay loam, or clay loam

Btk horizon:
Hue: 5YR or 7.5YR
Value: 5 to 8, 4 to 7 moist
Chroma: 3 to 6
Texture: Loam, sandy clay loam, or clay loam
Visible calcium carbonate: 15 to 35 percent in the form of films, threads, masses, and concretions

Arch Series

Map unit(s): MsE
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Interdunes
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 1 to 10 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, carbonatic, thermic Aridic Calciustepts

Typical Pedon

Map unit in which located: MsE, Milsand-Arch complex, 1 to 20 percent slopes
Location in survey area: Curry County, New Mexico; 850 feet south and 1,100 feet east of the northwest corner of section 35, T. 2 N., R. 31 E.; Latitude: 34 degrees 21 minutes 32 seconds N.; Longitude: 103 degrees 39 minutes 54 seconds W.

A—0 to 6 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine roots; few medium pores; violently effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

Bk1—6 to 16 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few medium pores; violently effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

Bk2—16 to 37 inches; very pale brown (10YR 8/3) sandy clay loam, very pale brown (10YR 7/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; few medium pores; violently effervescent; many small and medium masses and disseminated calcium carbonate; moderately alkaline; gradual smooth boundary.

Bk3—37 to 80 inches; very pale brown (10YR 7/3) sandy clay loam, pale brown (10YR 6/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; few fine roots; violently effervescent; many large masses and disseminated calcium carbonate; strongly alkaline.

Range in Characteristics

Depth to carbonates: Free carbonates are usually present in surface horizon.

A horizon:
Hue: 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 3 or 4

Bk horizon:
Hue: 7.5YR or 10YR
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: Fine sandy loam, sandy clay loam, or loam

Armesa Series

Map unit(s): 58, 60
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Low hills, pediments
Parent material: Eolian deposits and alluvium derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 0 to 7 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, carbonatic, thermic Ustic Haplocalcids

Typical Pedon
(taken from the DeBaca County, New Mexico Survey Report)

Map unit in which located: 50, Berwolf-Chispa-Armesa association, 0 to 5 percent slopes (as mapped in DeBaca County)
Location in adjoining survey area: About 8 miles south of Fort Sumner, DeBaca County, New Mexico; 2,000 feet south and 2,200 feet east of the northwest corner of section 25, T. 1 N., R. 26 E.; Latitude: 34 degrees 16 minutes 59 seconds N.; Longitude: 104 degrees 10 minutes 05 seconds W.

A—0 to 4 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; violently effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
Bw—4 to 15 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; violently effervescent; disseminated calcium carbonate; moderately alkaline; abrupt wavy boundary.
Bk1—15 to 24 inches; light reddish brown (5YR 6/4) sandy clay loam, reddish brown (5YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few fine roots; violently effervescent; many medium masses and nodules of calcium carbonate; moderately alkaline; gradual wavy boundary.
Bk2—24 to 37 inches; light reddish brown (5YR 6/4) sandy clay loam, reddish brown (5YR 5/4) moist; moderate fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; violently effervescent; common small masses of calcium carbonate; moderately alkaline; gradual wavy boundary.

Bk3—37 to 60 inches; pink (5YR 7/4) sandy clay loam, light reddish brown (5YR 6/4) moist; massive; hard, friable, slightly sticky and slightly plastic; violently effervescent; common large masses of calcium carbonate; moderately alkaline.

Range in Characteristics

Depth to calcic horizon: 7 to 19 inches
Calcium carbonate equivalent: 45 to 65 percent in the control section
Coarse Fragments: 0 to 10 percent

A horizon:
Hue: 5YR to 10YR
Value: 5 or 6, 3 to 5 moist
Chroma: 3 or 4
Texture: Fine sandy loam or sandy clay loam

Bw horizon:
Hue: 5YR to 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 2 to 4
Texture: Fine sandy loam or sandy clay loam

Bk horizon:
Hue: 5YR or 7.5YR
Value: 6 to 8, 5 to 7 moist
Chroma: 2 to 8
Texture: Sandy clay loam or fine sandy loam

Arvana Series

Map unit(s): AvA
Depth class: Moderately deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Plains
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 2 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Petrocalcic Paleustalfs

Typical Pedon

Map unit in which located: AvA, Arvana fine sandy loam, 0 to 2 percent slopes
Location in survey area: Curry County, New Mexico; 500 feet west and 100 feet south of the northeast corner of section 1, T. 2 N., R. 32 E.; Latitude: 34 degrees 26 minutes 04 seconds N.; Longitude: 103 degrees 31 minutes 52 seconds W.

A—0 to 11 inches; reddish brown (5YR 4/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; moderate, medium subangular blocky structure; hard, soft, nonsticky and nonplastic; common fine roots, few fine pores; neutral, abrupt smooth boundary.

Bt—11 to 21 inches; reddish brown (5YR 4/4) sandy clay loam, dark reddish brown (5YR 3/4) moist; weak coarse prismatic parting to moderate, medium subangular blocky structure; very hard, friable, nonsticky and nonplastic; few fine roots and pores; many thin continuous clay films on ped faces and in pores; neutral; clear smooth boundary.

Btk—21 to 31 inches; light reddish brown (5YR 6/3) loam, reddish brown (5YR 5/3) moist; weak medium subangular blocky structure; hard, friable, sticky and nonplastic, few fine roots; common fine and medium pores; few thin clay films on ped faces and in pores; many masses of calcium carbonate, violently effervescent; moderately alkaline; abrupt, wavy boundary.

Bkm—31 to 45 inches; pink (5YR 8/3) indurated caliche.

BCk—45 to 80 inches light reddish brown (5YR 6/3) sandy clay loam, reddish brown (5YR 5/3) moist, weak fine subangular blocky structure; hard, friable, slightly sticky and nonplastic; few fine roots and few fine pores, many medium and large masses of calcium carbonate, violently effervescent.

Range in Characteristics

Depth to carbonates: 10 to 21 inches
Depth to petrocalcic horizon: 25 to 40 inches

A horizon:
Hue: 5YR or 7.5YR
Value: 4, 3 moist
Chroma: 3 or 4
Texture: Fine sandy loam
Clay content: 8 to 18 percent

Bt horizon:
Hue: 5YR
Value: 4, 3 moist
Chroma: 3 or 4
Texture: Sandy clay loam or clay loam

Btk horizon:
Hue: 5YR
Value: 5 or 6, 4 or 5 moist
Chroma: 3 or 4
Texture: Loam or clay loam

Bkm horizon: Dominantly 6 to 12 inches thick, but ranges up to 2 feet in some pedons. It is strongly cemented to indurated.

BCk horizon:
Hue: 2.5YR to 7.5YR
Value: 4 to 8, 3 to 7 moist
Chroma: 3 to 8
Texture: Loam, sandy clay loam, or clay loam

Berwolf Series

Map unit(s): 61
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Interdunes

Parent material: Eolian deposits derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 1 to 5 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Coarse-loamy, mixed, superactive, thermic Ustic Calciargids

Typical Pedon
(taken from the DeBaca County, New Mexico Soil Survey Report)

Map unit in which located: 48, Berwolf-Sharvana association, 0 to 3 percent slopes (as mapped in DeBaca County)
Location in adjoining survey area: About 10 miles north and 2 miles west of Taiban, DeBaca County, New Mexico; 1,500 feet north and 2,500 feet east of the southwest corner of section 19, T. 4 N., R. 28 E.; Latitude: 34 degrees 33 minutes 12 seconds N.; Longitude: 104 degrees 02 minutes 38 seconds W.

A—0 to 11 inches; brown (7.5YR 4/4) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; slightly alkaline; clear smooth boundary.
Bt1—11 to 20 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and nonplastic; common fine and very fine roots; common thin clay films on faces of peds and in pores; moderately alkaline; clear wavy boundary.
Bt2—20 to 34 inches: yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and nonplastic; few fine and very fine roots; many thin clay films on faces of peds and in pores; slightly effervescent; disseminated calcium carbonate; moderately alkaline; clear wavy boundary.
Bk1—34 to 45 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 5/6) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; violently effervescent; common fine soft masses and few medium nodules of calcium carbonate; moderately alkaline; abrupt wavy boundary.
Bk2—45 to 60 inches; pink (5YR 8/3) fine sandy loam, reddish yellow (5YR 7/6) moist; massive; very hard, friable, slightly sticky and nonplastic; violently effervescent; many large masses and nodules of calcium carbonate; moderately alkaline.

Range in Characteristics

Depth to the calcic horizon: Between 30 and 60 inches

A horizon:
Hue: 5YR or 7.5YR
Value: 4 to 6, 3 or 4 moist
Chroma: 2 to 6
Texture: Loamy fine sand or fine sandy loam

Bt horizon:
Hue: 2.5YR to 7.5YR
Value: 4 to 6, 3 to 5 moist
Chroma: 3 to 6
Textures: Sandy loam or fine sandy loam

Bk horizon:
Hue: 2.5YR to 7.5YR
Value: 5 to 8, 4 to 7 moist
Chroma: 2 to 8
Textures: Sand, loamy fine sand, sandy loam, or fine sandy loam

Bippus Series

Map unit(s): BcA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Draws, flood plains
Parent material: Loamy alluvium
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 2 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Cumulic Haplustolls

Typical Pedon

Map unit in which located: BcA, Bippus clay loam, 0 to 2 percent slopes
Location in survey area: Curry County, New Mexico; 900 feet south and 300 feet west of the northeast corner of section 23, T. 4 N., R. 34 E.; Latitude: 34 degrees 33 minutes 44 seconds N.; Longitude: 103 degrees 17 minutes 48 seconds W.

A1—0 to 8 inches; brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; moderate, medium granular and subangular blocky structure; hard, very friable; sticky and slightly plastic; many very fine and fine roots; many very fine interstitial and tubular pores; neutral; gradual smooth boundary.

A2—8 to 13 inches; brown (7.5YR 4/3) clay loam, dark brown (7.5YR 3/3) moist; moderate, medium subangular blocky structure; hard, very friable, sticky and slightly plastic; many very fine and fine roots, many very fine interstitial and tubular pores; neutral; gradual smooth boundary.

Bw1—13 to 23 inches; brown (7.5YR 4/3) clay loam, dark brown (7.5YR 3/3) moist; moderate, medium subangular blocky structure; hard, very friable, moderately sticky, slightly plastic; many very fine and fine roots, many fine vesicular and tubular pores, few threads of calcium carbonate, slightly effervescent; slightly alkaline; clear, smooth boundary.

Bw2—23 to 80 inches; brown (7.5YR 4/4) clay loam, dark brown (7.5YR 3/4) moist; weak coarse prismatic structure parting to moderate, medium subangular blocky; hard, very friable, sticky and slightly plastic; common, very fine and fine roots, common, fine interstitial and tubular pores; many fine threads and few hard concretions of calcium carbonate in lower part; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 20 to 40 inches

A horizon:
Hue: 7.5YR or 10YR
Value: 4 or 5, 3 or 4 moist
Chroma: 2 or 3

Bw horizon:
Hue: 7.5YR or 10YR
Value: 4 or 5, 2 or 3 moist
Chroma: 2 to 4

Chispa Series

Map unit(s): 31, 60
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Low hills
Parent material: Red bed alluvium derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 0 to 5 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Ustic Haplocalcids

Typical Pedon

Map unit in which located: 50, Berwolf-Chispa-Armesa association, 0 to 5 percent slopes (as mapped in DeBaca County)
Location in adjoining survey area: About 6 miles south of Fort Sumner, DeBaca County, New Mexico; 20 feet north and 2,500 feet east of the southwest corner of section 20, T. 2 N., R. 26 E.; Latitude: 34 degrees 22 minutes 36 seconds N.; Longitude: 104 degrees 14 minutes 16 seconds W.

A—0 to 10 inches; brown (7.5YR 4/4) fine sandy loam, dark brown (7.5YR 3/4) moist; moderate fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine roots; violently effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
Bk1—10 to 31 inches; brown (7.5YR 5/4) sandy clay loam, strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure; very hard, friable, sticky and plastic; few fine and very fine roots; violently effervescent; many large soft masses and common medium nodules of calcium carbonate; moderately alkaline; clear wavy boundary.
Bk2—31 to 42 inches; light brown (7.5YR 6/4) sandy clay loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; few fine and medium roots; common fine pores; few fine concretions of calcium carbonate; violently effervescent; moderately alkaline; clear wavy boundary.
BCk—42 to 60 inches; light reddish brown (5YR 6/4) sandy clay loam, reddish brown (5YR 4/4) moist; massive; very hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; violently effervescent; few large soft masses and nodules of calcium carbonate; moderately alkaline.

Range in Characteristics

Depth to calcic horizon: 20 to 40 inches

A horizon:
Hue: 5YR to 10YR
Value: 4 or 5, 3 or 4 moist
Chroma: 2 to 4

Bk horizon:
Hue: 5YR to 7.5YR
Value: 4 to 7, 3 to 6 moist
Chroma: 4 to 6
Texture: Sandy clay loam or clay loam

BCk horizon:
Hue: 2.5YR to 7.5YR
Value: 6 to 8, 4 to 7 moist
Chroma: 4 to 6
Texture: Sandy loam, loam, or sandy clay loam

Drake Series

Map unit(s): DRC
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Dunes
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 1 to 8 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Aridic Calciustepts

Typical Pedon

Map unit in which located: DrC, Drake soils, 1 to 8 percent slopes
Location in survey area: Curry County, New Mexico; 700 feet south and 750 feet west of the northeast corner of section 2, T. 1 N., R. 31 E.; Latitude: 34 degrees 20 minutes 39 seconds N.; Longitude: 103 degrees 39 minutes 19 seconds W.

A—0 to 5 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine pores; disseminated calcium carbonate; strongly effervescent; slightly alkaline; clear, smooth boundary.

Bw1—5 to 14 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, sticky and plastic; few fine roots; common, very fine and fine pores; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bw2—14 to 34 inches; light gray (10YR 7/2) clay loam, light brownish gray (10YR 6/2) moist; moderate medium subangular blocky structure; soft, very friable, sticky and plastic; few fine roots; many fine pores; violently effervescent; moderately alkaline; clear, smooth boundary.

Bk—34 to 80 inches; light gray (2.5Y 7/2) sandy loam, light brownish gray (2.5Y 6/2) moist; massive; slightly hard, very friable, sticky and plastic; few fine pores; common fine and medium masses of calcium carbonate; violently effervescent; strongly alkaline.

Range in Characteristics

Depth to carbonates: At the surface

A horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4

Bw and Bk horizon:
Hue: 10 YR or 2.5Y
Value: 5 to 8, 4 to 7 moist
Chroma: 2 to 4
Texture: Sandy loam, loam, or sandy clay loam

Estacado Series

Map unit(s): EsA, EsB
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 3 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Aridic Paleustolls

Typical Pedon

Map unit in which located: EsB, Estacado loam, 1 to 3 percent slopes
Location in survey area: Curry County, New Mexico; 1,100 feet north and 1,100 feet west of the southeast corner of section 28, T. 7 N., R. 28 E.; Latitude: 34 degrees 47 minutes 50 seconds N.; Longitude: 103 degrees 58 minutes 35 seconds W.

A—0 to 10 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist, moderate medium subangular blocky structure parting to moderate medium granular; hard, very friable, nonsticky and nonplastic; many fine and very fine roots, few fine pores; strongly effervescent; slightly alkaline; gradual smooth boundary.

Bt—10 to 22 inches; dark brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure, hard, very friable, nonsticky and nonplastic; common fine and very fine roots, few fine pores; few thin clay films on ped faces and lining pores; strongly effervescent, slightly alkaline; clear, smooth boundary.

Btk1—22 to 32 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; weak medium prismatic structure parting to moderate, medium subangular blocky; hard, friable slightly sticky and nonplastic; few fine roots, few fine pores; few thin clay films on ped faces and lining pores, strongly effervescent; moderately alkaline; clear, smooth boundary.

Btk2—32 to 80 inches; pink (7.5YR 7/4) clay loam, light brown (7.5YR 6/4) moist; weak medium subangular blocky structure; hard, friable; slightly sticky and nonplastic; few fine roots, few fine pores; many very fine and fine masses of calcium carbonate, violently effervescent; moderately alkaline.

Range in Characteristics

A horizon:
Hue: 7.5YR or 10 YR

Value: 4 or 5, 3 or 4 moist
Chroma: 2 or 3

Bt horizon:
Hue: 7.5YR or 10YR
Value: 4 or 5, 3 or 4 moist
Chroma: 3 or 4

Btk horizon:
Hue: 7.5YR
Value: 4 to 8, 3 to 7 moist
Chroma: 3 to 6

Friona Series

Map unit(s): FrA
Depth class: Moderately deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Plains
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 1 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Petrocalcic Paleustolls

Typical Pedon

Map unit in which located: FrA, Friona loam, 0 to 1 percent slopes (fig. 7.)
Location in survey area: Quay County, New Mexico; 800 feet west and 100 feet south of the northeast corner of section 32, T. 6 N., R. 29 E.; Latitude: 34 degrees 42 minutes 24 seconds N.; Longitude: 103 degrees 53 minutes 04 seconds W.

A—0 to 8 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/3) moist, weak fine subangular blocky structure; hard, friable, nonsticky and nonplastic; few fine roots, few fine pores; neutral, abrupt smooth boundary.
Bt1—8 to 17 inches; brown (7.5YR 4/3) clay loam, dark brown (7.5YR 3/3) moist; moderate, medium subangular structure; very hard, firm, slightly sticky and slightly plastic; few fine roots, few fine and medium pores; thick, continuous clay films on ped faces and in pores; neutral, clear, smooth boundary.
Bt2—17 to 31 inches; brown (7.5YR 4/3) sandy clay loam, dark brown (7.5YR 3/3) moist, weak medium subangular blocky structure; very hard, firm, slightly sticky, slightly plastic; few fine roots, few fine and medium pores; thin, continuous clay films; neutral, clear, smooth boundary.
Bkm—31 to 35 inches; pinkish white (7.5YR 8/2) indurated caliche.
BCk—35 to 80 inches; light brown (7.5YR 6/3) sandy clay loam, brown (7.5YR 5/3) moist, weak fine subangular blocky structure, hard, friable, slightly sticky and nonplastic; few fine roots, few fine pores; many fine and medium masses of calcium carbonate, violently effervescent; moderately alkaline.

Range in Characteristics

Depth to petrocalcic horizon: 20 to 35 inches

A horizon:
Hue: 7.5YR

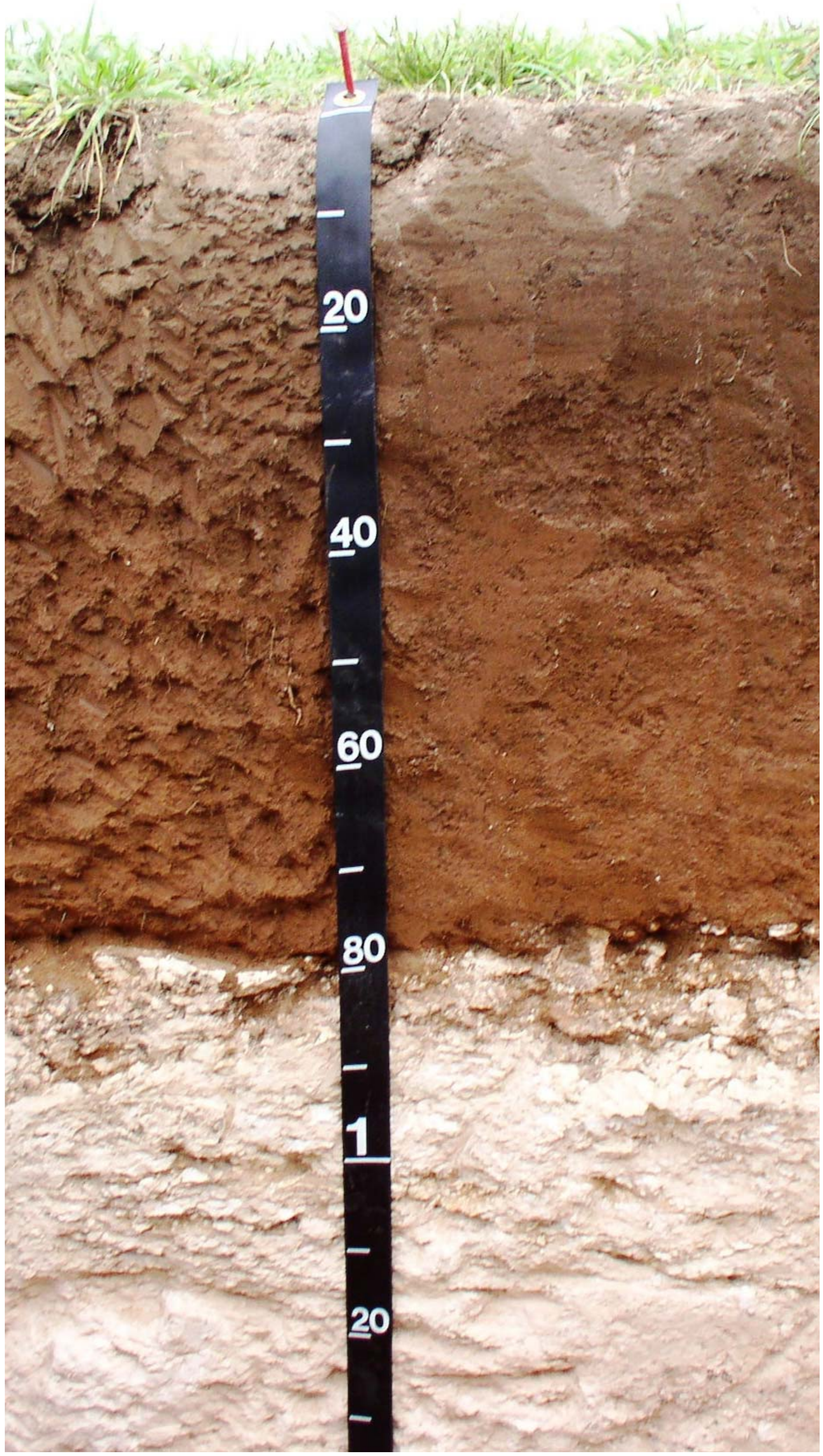

Figure 7.—A profile of Friona loam, 0 to 1 percent slopes. The subsoil has a hard layer of indurated caliche at 80 cm restricting the movement of water and roots.

Value: 4, 3 moist
Chroma: 2 or 3

Bt horizon:
Hue: 7.5YR
Value: 4 or 5, 3 or 4 moist
Chroma: 3 or 4
Texture: Clay loam or sandy clay loam

Bkm horizon: Indurated caliche

BCk horizon:
Hue: 7.5YR or 10YR
Value: 6 or 8, 5 or 7 moist
Chroma: 3 or 4
Texture: Loam, sandy clay loam, or clay loam

Gallen Series

Map unit(s): 37
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Hills
Parent material: Gravelly slope alluvium derived from igneous, metamorphic, and sedimentary rock
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 2 to 7 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Loamy-skeletal, mixed, superactive, thermic Ustic Haplocalcids

Typical Pedon

(taken from the DeBaca County, New Mexico Soil Survey Report)

Map unit in which located: 37, Ima-Gallen association, 2 to 7 percent slopes
Location in adjoining survey area: About 6 miles south of Fort Sumner, DeBaca County, New Mexico; 500 feet west of the southeast corner of section 16, T. 2 N., R. 26 E.; Latitude: 34 degrees 23 minutes 26 seconds N.; Longitude: 104 degrees 12 minutes 47 seconds W.

A—0 to 5 inches; reddish brown (5YR 5/4) gravelly sandy loam, reddish brown (5YR 4/4) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine roots; 20 percent pebbles; violently effervescent; disseminated calcium carbonate; moderately alkaline; abrupt smooth boundary.

Bw—5 to 20 inches; reddish brown (5YR 5/3) very gravelly sandy loam, reddish brown (5YR 4/3) moist; moderate medium subangular block structure; soft, very friable, nonsticky and nonplastic; common very fine roots; violently effervescent; disseminated calcium carbonate; moderately alkaline; clear wavy boundary.

Bk—20 to 60 inches; light reddish brown (5YR 6/4) extremely gravelly sandy loam with strata of extremely gravelly loamy sand and extremely gravelly fine sandy loam, reddish brown (5YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; violently effervescent;

disseminated calcium carbonate and coatings of calcium carbonate on rocks; moderately alkaline.

Range in Characteristics

A horizon:
Hue: 5YR to 10YR
Value: 4 or 5, 3 or 4 moist
Chroma: 3 or 4

Bw horizon:
Hue: 5YR or 7.5YR
Value: 4 to 6, 4 or 5 moist
Chroma: 3 or 4
Texture: Very gravelly sandy loam or very gravelly loam

Bk horizon:
Hue: 5YR or 7.5YR
Value: 5 to 7, 4 or 5 moist
Chroma: 2 to 4
Texture: Extremely gravelly sand, very gravelly loamy sand, extremely gravelly sandy loam, or extremely gravelly fine sandy loam

Gomez Series

Map unit(s): GoB
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Plains
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 3 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Coarse-loamy, mixed, active, thermic Aridic Calciustepts

Typical Pedon

Map unit in which located: GoB, Gomez loamy fine sand, 0 to 3 percent slopes
Location in survey area: Curry County, New Mexico; 2,550 feet north and 2,550 feet east of the southwest corner of section 1, T. 1 N., R. 31 E.; Latitude: 34 degrees 20 minutes 20 seconds N., Longitude: 103 degrees 38 minutes 39 seconds W.

A—0 to 12 inches; brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and few medium roots; few fine tubular and many fine interstitial pores; few fine masses of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk1—12 to 20 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; few fine and medium fine pores; few fine masses of calcium carbonate; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bk2—20 to 23 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; few fine roots; common fine pores; few fine concretions of calcium carbonate; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bk3—23 to 47 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few fine roots; many fine pores; common fine masses and coatings of calcium carbonate; violently effervescent; strongly alkaline; gradual smooth boundary.

C—47 to 80 inches; very pale brown (10YR 7/3) loamy fine sand, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; many fine pores; common fine masses of calcium carbonate; violently effervescent; strongly alkaline.

Range in Characteristics

Depth to calcic horizon: 15 to 40 inches

A horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 2 or 3

Bk horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 2 to 4
Texture: Fine sandy loam, sandy loam, or clay loam

C horizon:
Hue: 7.5YR or 10YR
Value: 6 to 8, 5 to 7 moist
Chroma: 1 to 4
Texture: Loamy fine sand, fine sandy loam, or loam

Grier Series

Map unit(s): GrA
Depth class: Very deep
Drainage class: Somewhat poorly drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Landform: Basin floors, playa floors, pluvial lakes (relict)
Parent material: Clayey lacustrine deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 2 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, calcareous, thermic Typic Endoaquepts

Typical Pedon

Map unit in which located: GrA, Grier clay loam, 0 to 2 percent slopes
Location in survey area: Curry County, New Mexico: 70 feet south and 2,450 feet east of the NW corner of section 2, T. 1 N., R. 31 E.; Latitude: 34 degrees 20 minutes 46 seconds N.; Longitude: 103 degrees 39 minutes 43 seconds W.

A—0 to 4 inches; dark grayish brown (2.5Y 4/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; common very fine and fine roots throughout and common medium roots; common very fine and fine tubular pores; violently effervescent; slightly alkaline; abrupt smooth boundary.

Bw1—4 to 13 inches; light gray (5Y 7/1) and gray (5Y 5/1) clay loam, light gray (5Y 7/1) to gray (5Y 6/1) crushed, and dark gray (5Y 4/1) moist; moderate medium subangular blocky structure; slightly hard, firm, very sticky, very plastic; common very fine and fine roots; common very fine and fine tubular pores; violently effervescent; slightly alkaline; abrupt smooth boundary.

Bw2—13 to 18 inches; gray (5Y 6/1) clay loam, gray (5Y 5/1) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, very sticky, very plastic; common very fine and fine roots; common fine and medium tubular pores; violently effervescent; moderately alkaline; clear smooth boundary.

Bgk1—18 to 28 inches; gray (5Y 6/1) sandy clay loam, dark gray (5Y 4/1) moist; moderate medium prismatic structure parting to strong medium subangular blocky; hard, firm, very sticky, very plastic; common very fine and fine roots; common fine and medium tubular pores; few fine distinct pale yellow (2.5Y 7/4) iron concentrations; few angular cylindrical soft masses of carbonate; violently effervescent; strongly alkaline; clear smooth boundary.

Bgk2—28 to 35 inches; light gray (5Y 7/1) sandy clay loam, light gray (5Y 7/1) to gray (5Y 6/1) moist; moderate medium prismatic structure parting to strong medium subangular blocky; hard, firm, very sticky, very plastic; few very fine and fine roots throughout and roots; common very fine and fine tubular pores; few fine distinct pale yellow (2.5Y 7/6) iron concentrations; few angular cylindrical soft masses of carbonate; violently effervescent; strongly alkaline; clear smooth boundary.

Bgk3—35 to 65 inches; light gray (5Y 7/1) clay loam, light gray (5Y 7/1) moist; moderate coarse prismatic structure parting to strong medium subangular blocky; hard, firm, very sticky, very plastic; few very fine and fine roots; common very fine and fine tubular pores; common fine distinct pale yellow (2.5Y 8/2) iron concentrations; violently effervescent; strongly alkaline; clear smooth boundary.

Bgk4—65 to 80 inches; light gray (5Y 7/1) clay loam, light gray (5Y 7/1) moist; very few distinct pale yellow (2.5Y 7/6) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, firm, very sticky, slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; violently effervescent; strongly alkaline.

Range in Characteristics

Depth to water table: 1.5 to 3 feet

A horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7, 4 to 7 moist
Chroma: 1 or 2

Bw horizon:
Hue: 2.5Y or 5Y
Value: 5 to 7, 4 to 6 moist
Chroma: 1 or 2
Texture: Sandy clay loam or clay loam

Bgk horizon:
Hue: 2.5Y or 5Y
Value: 6 or 7, 5 to 7 moist
Chroma: 1 or 2

Texture: Clay loam or clay
Redoximorphic features: Amount—very few to few; hue—2.5Y; value—7 or 8; chroma—2 to 6; kind—iron concentrations

Hassell Series

Map unit(s): 11
Depth class: Moderately deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Landform: Pediments
Parent material: Red bed alluvium derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 0 to 5 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine, smectitic, thermic Ustertic Haplargids

Typical Pedon

Map unit in which located: 11, Tucumcari-Hassell clay loams, 0 to 5 percent slopes
Location in survey area: Quay County, New Mexico; 2,500 feet north and 1,050 feet east of the southwest corner of section 29, T. 8 N., R. 27 E.; Latitude: 34 degrees 42 minutes 21 seconds N.; Longitude: 104 degrees 06 minutes 32 seconds W.

A—0 to 4 inches; reddish brown (5YR 5/3) clay loam, reddish brown (5YR 4/3) moist; weak very fine and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; few very fine and fine pores; moderately alkaline; clear smooth boundary.
Bt—4 to 18 inches; reddish brown (5YR 4/3) clay loam, reddish brown (5YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine and fine roots; few very fine and fine pores; common thin clay films on ped faces and lining pores; moderately alkaline; clear smooth boundary.
Btk—18 to 34 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; weak fine and medium subangular blocky structure; few very fine and fine roots; few very fine pores; few fine soft masses of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary
R—34 to 38 inches; reddish brown (2.5YR 4/4) shale.

Range in Characteristics

Depth to shale: 20 to 40 inches

A horizon:
Hue: 5YR or 7.5YR
Value: 4 or 5, 3 or 4 moist
Chroma: 3 or 4

Bt and Btk horizon:
Hue: 2.5YR or 5YR
Value: 4 to 6, 3 to 5 moist
Chroma: 3 to 6
Texture: Clay loam or clay

Ima Series

Map unit(s): 37
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Hillslopes
Parent material: Red bed alluvium derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 2 to 5 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Coarse-loamy, mixed, superactive, thermic Ustic Haplocambids

Typical Pedon

(taken from the DeBaca County, New Mexico Soil Survey Report)

Map unit in which located: 37, Ima-Gallen association, 2 to 7 percent slopes
Location in adjoining survey area: DeBaca County, New Mexico; 1,400 feet west and 20 feet north of the southeast corner of section 27, T. 3 N., R. 26 E.; Latitude: 34 degrees 26 minutes 56 seconds N; Longitude: 104 degrees 11 minutes 54 seconds W.

Ap—0 to 10 inches; reddish brown (5YR 4/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; moderate fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine roots and common medium roots; strongly effervescent; disseminated calcium carbonate; slightly alkaline; clear smooth boundary.

Bw—10 to 36 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; many fine and very fine roots and common medium roots; strongly effervescent; disseminated calcium carbonate; moderately alkaline; gradual smooth boundary.

Bk—36 to 40 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common fine and very fine roots and few medium roots; violently effervescent; few thin mycelia and few rounded soft masses of calcium carbonate; moderately alkaline; gradual smooth boundary.

C—40 to 60 inches; light reddish brown (5YR 6/4) sandy loam, reddish brown (5YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; common fine and very fine roots and few medium roots; violently effervescent; disseminated calcium carbonate; moderately alkaline.

Range in Characteristics

A horizon:
Hue: 5YR or 7.5YR
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4

B horizon:
Hue: 5YR or 7.5YR
Value: 4 to 6, 3 to 6 moist

Chroma: 3 to 6
Texture: Fine sandy loam, sandy loam, or loam

C horizon:
Hue: 5YR or 7.5YR
Value: 5 to 7, 3 to 6 moist
Chroma: 4 to 6
Texture: Fine sandy loam or sandy loam

Kimberson Series

Map unit(s): KmB
Depth class: Shallow
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Low hills, plains
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 3 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Loamy, mixed, superactive, thermic, shallow Petrocalcic Calciustolls

Typical Pedon

Map unit in which located: KmB, Kimberson gravelly loam, 0 to 3 percent slopes
Location in survey area: Curry County, New Mexico; 1,600 feet south and 1,900 feet east of the northwest corner of section 30, T. 5 N, R. 33 E.; Latitude: 34 degrees 37 minutes 45 seconds N.; Longitude: 103 degrees 29 minutes 25 seconds W.

A1—0 to 5 inches; brown (7.5YR 4/2) gravelly loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine and common medium roots; common fine and medium pores; 20 percent fragments of calcium carbonate nodules; few fine small masses of calcium carbonate; strongly effervescent; moderately alkaline; abrupt smooth boundary.

A2—5 to 14 inches; brown (7.5YR 5/3) gravelly loam, dark brown (7.5YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine and few medium roots; common fine pores; 30 percent large and medium concretions of calcium carbonate; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bkm—14 to 20 inches; indurated caliche.

BCk—20 to 80 inches; pink (7.5YR 8/3) gravelly loam, pink (7.5YR 7/3) moist; massive; hard, friable, slightly sticky and slightly plastic; 30 percent fragments of calcium carbonate; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to petrocalcic horizon: 10 to 16 inches

A horizon:
Hue: 7.5YR
Value: 3 to 5, 2 or 3 moist

Chroma: 2 or 3
Texture: Gravelly loam

Bkm horizon: Indurated caliche

BCk horizon:
Hue: 7.5YR
Value: 7 or 8, 6 or 7 moist
Chroma: 2 to 4
Texture: Sandy loam to clay loam

Lacoca Series

Map unit(s): 10, 28, 32
Depth class: Very shallow to shallow
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Structural benches
Parent material: Alluvium derived from sandstone and/or residuum weathered from sandstone
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 5 to 50 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Loamy, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents

Typical Pedon

Map unit in which located: 10, Regnier-Rock outcrop-Lacoca complex, 30 to 80 percent slopes
Location in survey area: Quay County, New Mexico; 260 feet south and 1,300 feet east of the northwest corner of section 5, T. 8 N. R. 27 E.; Latitude: 34 degrees 57 minutes 13 seconds N.; Longitude: 104 degrees 06 minutes 25 seconds W.

A1—0 to 3 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine and fine pores; slightly effervescent; moderately alkaline; abrupt wavy boundary.
A2—3 to 8 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine and fine pores; violently effervescent; abrupt smooth boundary.
R— 8 to 12 inches; hard sandstone.

Range in Characteristics

Depth to sandstone: 5 to 20 inches

A horizon:
Hue: 2.5YR to 7.5YR
Value: 4 to 6, 3 to 5 moist
Chroma: 3 to 6
Texture: Sandy loam or fine sandy loam

R horizon:
Hardness: 3 or 4 on the Mohs scale

Lazbuddie Series

Map unit(s): LcA
Depth class: Very deep
Drainage class: Moderately well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Landform: Playa steps
Parent material: Clayey lacustrine deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 1 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine, smectitic, thermic Calcic Haplusterts

Typical Pedon

Map unit in which located: LcA, Lazbuddie clay, 0 to 1 percent slopes
Location in survey area: Curry County, New Mexico; 3,200 feet east and 100 feet south of the northwest corner of section 29, T. 8 N., R. 35 E.; Latitude 34 degrees 53 minutes 43 seconds N.; Longitude: 103 degrees 15 minutes 20 seconds W.

A—0 to 10 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist, moderate, medium subangular blocky structure; extremely hard, very firm, sticky and plastic; many fine roots, common fine and medium pores; strongly effervescent, moderately alkaline; gradual smooth boundary.

Bss1—10 to 22 inches; gray (10YR 5/1) clay, dark grayish brown (10YR 4/2) moist, moderate, medium subangular blocky structure; extremely hard, very firm, sticky and plastic; common fine roots, few fine and medium pores; few intersecting slickensides; strongly effervescent, moderately alkaline; gradual smooth boundary.

Bss2—22 to 45 inches; gray (10YR 5/1) clay, dark grayish brown (10YR 4/2) moist, moderate, medium subangular blocky structure; extremely hard, very firm, sticky and plastic; common fine roots, few fine and medium pores; many intersecting slickensides, strongly effervescent, moderately alkaline; gradual smooth boundary.

Bkss—45 to 80 inches; light brownish gray (10YR 6/2) clay, grayish brown (10YR 5/2) moist, weak medium subangular blocky structure; hard, friable, slightly sticky, slightly plastic, few very fine roots, many fine and medium pores; many fine carbonates disseminated throughout, strongly effervescent, moderately alkaline.

Range in Characteristics

A horizon:
Hue: 10YR
Value: 5 to 7, dry 4 to 6 moist
Chroma: 1 or 2

Bss horizon:
Hue: 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 1 to 3

Bkss horizon:
Hue: 10YR
Value: 5 to 7, 4 to 6 moist
Chroma: 1 or 2

Lofton Series

Map unit(s): LoA
Depth class: Very deep
Drainage class: Moderately well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Landform: Depressions
Parent material: Clayey eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 1 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine, mixed, superactive, thermic Vertic Argiustolls

Typical Pedon

Map unit in which located: LoA, Lofton clay loam, 0 to 1 percent slopes
Location in survey area: Curry County, New Mexico; 2,200 feet west and 2,100 feet north of the southeast corner of section 12, T. 8 N., R. 35 E.; Latitude: 32 degrees 55 minutes 47 seconds N.; Longitude: 103 degrees 11 minutes 10 seconds W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine pores; slightly alkaline; clear wavy boundary.

Bt1—6 to 14 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; hard, friable, sticky and plastic; many slickensides; many distinct clay films on faces of peds; few very fine and fine roots; few very fine pores; slightly alkaline; gradual wavy boundary.

Bt2—14 to 25 inches; grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; strong angular blocky structure; hard, friable, sticky and plastic; many slickensides; many distinct clay films on faces of peds; few very fine roots and few very fine pores; slightly alkaline, violently effervescent; gradual smooth boundary.

Btk—25 to 50 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium blocky structure; very hard, firm, sticky and plastic; few to common distinct clay films on faces of peds; common films and threads, few medium masses of calcium carbonate; few fine roots and few fine pores; strongly alkaline and strongly effervescent; gradual smooth boundary.

Bk—50 to 80 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium blocky structure; very hard, firm, sticky and plastic; common masses of calcium carbonate; strongly alkaline, violently effervescent.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 34 inches
Depth to visible carbonates: 20 to 40 inches

A horizon:
Hue: 10YR or 2.5Y
Value: 3 or 4, 2 or 3 moist
Chroma: 1 or 2

Bt horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5, 3 or 4 moist
Chroma: 1 to 3
Texture: Silty clay or clay

Btk and Bk horizon:
Hue: 10YR
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: Clay loam

McLean Series

Map unit(s): McA
Depth class: Very deep
Drainage class: Somewhat poorly drained
Slowest permeability: 0.00 to 0.06 in/hr (very slow)
Landform: Playa floors
Parent material: Clayey lacustrine deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 1 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine, smectitic, thermic Udic Haplusterts

Typical Pedon

Map unit in which located: McA, McLean clay, 0 to 1 percent slopes; occasionally ponded

Location in survey area: Quay County, New Mexico; about 1 miles south of Jordan, New Mexico; 600 feet east and 400 feet south of the northwest corner of section 2, T. 6 N., R. 29 E.; Latitude: 34 degrees 46 minutes 47 seconds N.; Longitude: 103 degrees 50 minutes 38 seconds W.

A1—0 to 6 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky and plastic; common fine and very fine roots; common very fine and fine pores; strongly effervescent; slightly alkaline; clear wavy boundary.

Bss1—6 to 23 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; strong, moderate angular blocky structure with wedge-shaped aggregates; very hard, very firm, sticky and plastic; common fine and medium roots; common very fine pores; strongly effervescent; few fine masses of calcium carbonate; moderately alkaline; clear wavy boundary.

Bss2—23 to 41 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; strong medium angular blocky structure with wedge-shaped aggregates; very hard, very firm, sticky and plastic; few very fine and fine roots; common very fine pores; violently effervescent: few fine masses and concretions of calcium carbonate; slightly alkaline; gradual wavy boundary.

Bkss1—41 to 62 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; strong angular blocky structure with wedge-shaped aggregates; very hard, very firm, sticky and plastic; few very fine pores; common fine and medium distinct light brownish gray (2.5YR 6/2) iron concentrations; violently effervescent; few fine masses and concretions of calcium carbonate; slightly alkaline; clear wavy boundary.

Bkss2—62 to 71 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; moderate medium angular blocky structure with wedge-shaped aggregates; very hard, very firm, sticky and plastic; few fine faint dark gray (10YR 4/1) iron depletions; violently effervescent, few fine soft masses and concretions of calcium carbonate; moderately alkaline; gradual wavy boundary.

Bkss3—71 to 80 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; moderate medium angular blocky structure with wedge-shaped aggregates; very hard, very firm, sticky and plastic; common prominent brownish yellow (10YR 6/8) iron coatings on faces of peds and root channels; violently effervescent, few fine soft masses and concretions of calcium carbonate; moderately alkaline; gradual wavy boundary.

Range in Characteristics

A horizon:
Hue: 10YR
Value: 3 or 4, 2 or 3 moist
Chroma: 1 or 2
Redoximorphic features: None to few

Bss horizon:
Hue: 10YR or 2.5Y
Value: 3 to 6, 2 to 5 moist
Chroma: 1 or 2
Redoximorphic features: None to common

Bkss horizon:
Hue: 10YR or 2.5Y
Value: 4 to 8, 3 to 7 moist
Chroma: 1 or 2
Redoximorphic features: None to common in the form of iron-manganese concretions or oxidized rhizospheres

Milsand Series

Map unit(s): MsD, MsE
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Landform: Dunes
Parent material: Sandy eolian deposits
Elevation: 4,100 to 5,420 feet (1,250 to 1,651 meters)
Slope: 1 to 20 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Mixed, thermic Aridic Ustipsamments

Typical Pedon

Map unit in which located: MsE, Milsand-Arch complex, 1 to 20 percent slopes
Location in survey area: Curry County, New Mexico; 1,200 feet south and 2,000 feet west of the northeast corner of section 5, T. 1 N., R. 31 E.; Latitude: 34 degrees 20 minutes 37 seconds N.; Longitude:103 degrees 41 minutes 08 seconds W.

A—0 to 8 inches; pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; many fine and medium roots; common fine and medium pores; disseminated calcium carbonate; violently effervescent; moderately alkaline; gradual wavy boundary.

C—8 to 30 inches; pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; single grain; soft, loose, nonsticky and nonplastic; common fine and medium and few large roots; few very fine and medium pores; disseminated calcium carbonate; violently effervescent; strongly alkaline; abrupt smooth boundary.

Ab—30 to 37 inches; light brownish gray (10YR 6/2) fine sand, grayish brown (10YR 5/2) moist; single grain; soft, loose, nonsticky and nonplastic; common, very fine and fine roots; few very fine and medium pores; disseminated calcium carbonate; violently effervescent; strongly alkaline; gradual wavy boundary.

Cb—37 to 80 inches; pale brown (10YR 6/3) fine sand, pale brown (10YR 6/3) moist; single grain; soft, loose, nonsticky and nonplastic; common, very fine and fine roots; few very fine and medium pores; disseminated calcium carbonate; violently effervescent; strongly alkaline.

Range in Characteristics

Depth to carbonates: At the surface

A, Ab, C or Cb horizon:
Hue: 7.5YR or 10YR
Value: 5 to 7, 4 to 6 moist
Chroma: 2 to 4
Texture: Sand or fine sand

Mobeetie Series

Map unit(s): PMG
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Scarp slopes, valley sides
Parent material: Loamy colluvium
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 3 to 45 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Coarse-loamy, mixed, superactive, thermic Aridic Haplustepts

Typical Pedon

Map unit in which located: PMG, Potter-Mobeetie association, 3 to 45 percent slopes
Location in survey area: Curry County, New Mexico; 900 feet west and 100 feet north of the southeast corner of section 36, T. 7 N., R. 36 E.; Latitude: 34 degrees 46 minutes 40 seconds N.; Longitude: 103 degrees 04 minutes 34 seconds W.

A—0 to 12 inches; grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium granular structure; hard, very friable, nonsticky and nonplastic; common fine roots, few fine pores; 5 to 10 percent caliche pebbles, strongly effervescent, moderately alkaline, clear, smooth boundary.

Bw—12 to 16 inches; pinkish gray (7.5YR 6/2) fine sandy loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few fine roots and few fine pores; about 5 percent caliche pebbles, strongly effervescent; moderately alkaline, clear, smooth boundary.

Bk1—16 to 26 inches; pink (7.5YR 7/3) fine sandy loam, light brown (7.5YR 6/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, nonplastic; few fine roots, few fine pores; few masses of calcium carbonate, violently effervescent, strongly alkaline, clear, smooth boundary.

Bk2—26 to 80 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; weak fine and medium subangular blocky structure; soft, friable, nonsticky and nonplastic; few fine roots, few fine pores; few fine masses of calcium carbonates, violently effervescent, strongly alkaline.

Range in Characteristics

A horizon:
Hue: 10YR
Value: 4 or 5, 3 or 4 moist
Chroma: 2 or 3

Bw horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6, 4 or 5 dry
Chroma: 2 to 6

Bk horizon:
Hue: 7.5YR
Value: 6 or 7, 5 or 6 moist
Chroma: 2 to 4
Texture: Fine sandy loam or gravelly sandy loam

Nutivoli Series

Map unit(s): NtC, NtD
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Landform: Dunes
Parent material: Eolian sands
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 3 to 12 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Mixed, thermic Aridic Ustipsamments

Typical Pedon

Map unit in which located: NtD, Nutivoli fine sand, 5 to 12 percent slopes
Location in survey area: Curry County, New Mexico; 2,800 feet south and 700 feet east of the northwest corner of section 20, T. 2 N., R. 33 E.; Latitude: 34 degrees 22 minutes 30 seconds N.; Longitude: 103 degrees 30 minutes 32 seconds W.

A—0 to 6 inches; brown (7.5YR 5/4) fine sand, brown (7.5YR 4/4) moist; single grain; soft, loose, nonsticky and nonplastic; many fine and few medium roots; few very fine pores; slightly alkaline; gradual smooth boundary.

C1—6 to 24 inches; strong brown (7.5YR 5/6) fine sand, strong brown (7.5YR 4/6) moist; single grain; soft, loose, nonsticky and nonplastic; few medium roots; many fine and very fine pores; slightly alkaline; gradual smooth boundary.

C2—24 to 37 inches; brown (7.5YR 4/4) fine sand, dark brown (7.5YR 3/4) moist; single grain; soft, loose, nonsticky and nonplastic; few medium roots; many very fine and fine pores; slightly alkaline; gradual smooth boundary.

C3—37 to 50 inches; strong brown (7.5YR 4/6) loamy fine sand, strong brown (7.5YR 4/6) moist; weak very coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; few medium roots; many very fine and fine pores; slightly alkaline; gradual smooth boundary.

C4—50 to 80 inches; strong brown (7.5YR 5/6) fine sand, strong brown (7.5YR 4/6) moist; single grain; soft, loose, nonsticky and nonplastic; few medium roots; many very fine and fine pores; slightly alkaline; gradual smooth boundary.

Range in Characteristics

A horizon:
Hue: 7.5YR
Value: 5 or 6, 4 or 5 moist
Chroma: 4 to 7

C horizon:
Hue: 5YR or 7.5YR
Value: 4 or 5, 3 or 4 moist
Chroma: 4 to 6
Texture: Fine sand or loamy fine sand

Olton Series

Map unit(s): OcB, OcA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 3 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine, mixed, superactive, thermic Aridic Paleustolls

Typical Pedon

Map unit in which located: OcA, Olton clay loam, 0 to 1 percent slopes
Location in survey area: Curry County, New Mexico; 600 feet south and 1,100 feet east of the northwest corner of section 2, T. 7 N., R. 36 E.; Latitude: 34 degrees 51 minutes 46 seconds N.; Longitude: 103 degrees 06 minutes 15 seconds W.

Ap—0 to 6 inches; dark brown (10YR 3/3) clay loam, very dark brown (10YR 2/2) moist; weak fine and medium granular structure; hard, friable, slightly sticky and slightly plastic; common fine and medium roots, few fine and medium interstitial pores; slightly alkaline; abrupt smooth boundary.

Bt—6 to 17 inches; brown (7.5YR 4/2) clay, dark brown (7.5YR 3/2) moist; strong fine and medium angular blocky structure; very hard, firm, sticky and plastic; common fine and medium roots, few fine and medium tubular and interstitial pores; many distinct clay films on faces of peds and lining pores; slightly alkaline; clear smooth boundary.

Btk1—17 to 26 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; strong fine and medium angular blocky structure; very hard, firm, sticky and plastic; common fine roots, common fine and medium tubular pores; many distinct clay films on faces of peds and lining pores; common fine irregular-shaped masses of calcium carbonate; slightly effervescent, strongly alkaline; clear smooth boundary.

Btk2—26 to 35 inches; reddish brown (5YR 5/4) clay loam, yellowish red (5YR 5/6) moist; moderate fine and medium subangular structure; hard, friable, sticky and plastic; common fine roots, few fine and medium tubular pores; common distinct clay films on faces of peds and lining pores; many fine irregular-shaped masses of calcium carbonate; slightly effervescent, strongly alkaline; clear smooth boundary.

Btk3—35 to 41 inches; yellowish red (5YR 5/6) clay loam, yellowish red (5YR 5/6) moist; moderate medium prismatic structure parting to moderate fine and medium subangular; hard, friable, sticky and plastic; common fine roots, common fine and medium tubular pores; common distinct clay films on faces of peds and lining pores; many fine irregular-shaped masses of calcium carbonate; slightly effervescent; moderately alkaline; clear smooth boundary.

Btk4—41 to 59 inches; pink (5YR 7/3) clay loam, light reddish brown (5YR 6/4) moist; moderate coarse prismatic structure parting to weak medium subangular; hard, friable, slightly sticky and slightly plastic; few fine roots, common fine and medium tubular pores; common distinct clay films on faces of peds and lining pores; many fine irregular-shaped masses of calcium carbonate; violently effervescent, moderately alkaline; gradual wavy boundary.

Btk5—59 to 80 inches; reddish yellow (5YR 6/6) clay loam yellowish red (5YR 5/6) moist; moderate medium subangular structure; very hard, firm, slightly sticky and slightly plastic; few fine roots; many fine and medium tubular pores; common distinct clay films on faces of peds and lining pores; common medium masses of calcium carbonate; violently effervescent; moderately alkaline.

Range of characteristics

Thickness of mollic epipedon: 12 to 26 inches
Depth to carbonates: 14 to 28 inches

A horizon:
Hue: 5YR to 10YR
Value: 3 or 4, 2 or 3 moist
Chroma: 2 or 3

Bt horizon:
Hue: 5YR or 7.5YR
Value: 4 or 5, 3 or 4 moist
Chroma: 2 to 4
Texture: Clay loam or clay

Btk horizon:
Hue: 5YR or 7.5YR
Value: 5 to 7, 4 to 6 moist
Chroma: 3 to 6

Pep Series

Map unit(s): PcB, PcA, PeB, PeA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 3 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Aridic Calciustolls

Typical Pedon

Map unit in which located: PeB, Pep loam, 1 to 3 percent slopes
Location in survey area: Curry County, New Mexico; 1,400 feet south and 900 feet east of the northwest corner of section 19, T. 37 E., R. 3 N.; Latitude: 34 degrees 49 minutes 02 seconds N.; Longitude: 103 degrees 10 minutes 32 seconds W.

A1—0 to 6 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine pores; strongly effervescent; slightly alkaline; clear smooth boundary.
A2—6 to 14 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; few very fine and fine pores; strongly effervescent; slightly alkaline; clear smooth boundary.
Bw—14 to 30 inches; brown (7.5YR 5/4) loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; common very fine and fine roots; few very fine and fine pores; strongly effervescent; moderately alkaline; clear smooth boundary.
Bk1—30 to 40 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine pores; common fine and medium masses of calcium carbonate; violently effervescent; moderately alkaline; gradual irregular boundary.
Bk2—40 to 80 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine pores; common fine threads of calcium carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches

A horizon:
Hue: 7.5YR or 10YR
Value: 4 or 5, 3 or 4 moist
Chroma: 2 or 3
Texture: Loam or clay loam

Bw horizon:
Hue: 7.5YR

Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4
Texture: Loam or clay loam

Bk horizon:
Hue: 7.5YR
Value: 6 to 8, 5 to 7 moist
Chroma: 2 to 4
Texture: Loam or clay loam

Portales Series

Map unit(s): PoA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Plains, playa steps
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 1 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Aridic Calciustolls

Typical Pedon

Map unit in which located: PoA, Portales loam, 0 to 1 percent slopes
Location in survey area: Quay County, New Mexico; 1,500 feet north and 800 feet west of the southeast corner of section 25, T. 6 N., R. 30 E.; Latitude: 34 degrees 42 minutes 42 seconds N.; Longitude: 103 degrees 42 minutes 27 seconds W.

A—0 to 15 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure parting to moderate medium granular; soft, very friable, slightly sticky and slightly plastic; many fine roots, common fine pores; few fine masses of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.

Bk1—15 to 35 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure; soft, very friable, slightly sticky and slightly plastic; few fine roots; many very fine and fine pores; few fine masses and disseminated calcium carbonate; violently effervescent; moderately alkaline; gradual smooth boundary.

Bk2—35 to 43 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; weak coarse prismatic structure; soft, very friable, slightly sticky and slightly plastic; few fine masses and disseminated calcium carbonate; violently effervescent; moderately alkaline; gradual smooth boundary.

Bk3—43 to 60 inches; light gray (10YR 7/2) clay loam, light brownish gray (10YR 6/2) moist; weak medium and coarse subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common fine masses and disseminated calcium carbonate; violently effervescent; moderately alkaline.

Bk4—60 to 80 inches; very pale brown (10YR 8/2) clay loam, light gray (10YR 7/2) moist; weak medium and coarse subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common fine masses of calcium carbonate; violently effervescent; moderately alkaline.

Range in Characteristics:

Depth to calcic horizon: 5 to 15 inches

A horizon:
Hue: 10YR
Value: 3 to 5, 2 or 3 moist
Chroma: 2 or 3

Bk horizon:
Hue: 10YR or 2.5Y
Value: 5 to 8, 4 to 7 moist
Chroma: 2 to 5
Texture: Loam or clay loam

Posey Series

Map unit(s): PsA, PsB, PsC
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Plains, playa slopes
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 8 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Calcidic Paleustalfs

Typical Pedon

Map unit in which located: PsB, Posey fine sandy loam, 1 to 3 percent slopes
Location in survey area: Curry County, New Mexico; 900 feet south and 1,300 feet west of the northeast corner of section 24, T. 5 N., R. 32 E.; Latitude: 34 degrees 38 minutes 44 seconds N.; Longitude: 103 degrees 29 minutes 57 seconds W.

Ap—0 to 5 inches; brown (7.5YR 4/4); fine sandy loam, dark brown (7.5YR 3/4); moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; disseminated calcium carbonate; strongly effervescent, moderately alkaline; abrupt smooth boundary.

Btk1—5 to 9 inches; dark yellowish brown (10YR 4/4) clay loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine and few coarse pores; violently effervescent; moderately alkaline; clear smooth boundary.

Btk2—9 to 15 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; few fine pores; few faint clay films lining pores; few fine filaments of calcium carbonate on surface of peds; violently effervescent; moderately alkaline; clear wavy boundary.

Btk3—15 to 33 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm, sticky and plastic; few fine and few coarse roots; common fine and few very fine pores; few faint clay films lining pores; disseminated calcium carbonate; few fine filaments, concretions and faint coatings of calcium carbonate on surface of peds; violently effervescent; moderately alkaline; clear wavy boundary.

Btk4—33 to 49 inches; pink (7.5YR 7/4) clay loam, strong brown (7.5YR 5/6) moist; moderate fine subangular blocky structure; very hard, firm, sticky and plastic; few fine roots; few very fine and fine pores; few faint clay films in pores and root channels; many distinct medium masses of calcium carbonate; violently effervescent; moderately alkaline; clear wavy boundary.

Btk5—49 to 80 inches; pink (7.5YR 7/4) sandy clay loam, strong brown (7.5YR 5/6) moist; weak fine subangular blocky structure; very hard, firm, sticky and plastic; few fine roots; few very fine and fine pores; few faint clay films in pores; common distinct medium masses of calcium carbonate; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: At the surface

A horizon:
Hue: 7.5YR or 10YR
Value: 4 or 5, 3 or 4 moist
Chroma: 2 to 4

Btk horizon:
Hue: 5YR to 10YR
Value: 4 to 7, 3 to 6 moist
Chroma: 4 to 6
Texture: Sandy clay loam or clay loam

Potter Series

Map unit(s): PMG
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Ridges, scarp slopes
Parent material: Loamy alluvium
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 3 to 30 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Loamy-skeletal, carbonatic, thermic Petronodic Ustic Haplocalcids

Typical Pedon

Map unit in which located: PMG, Potter-Mobeetie association, 8 to 45 percent slopes
Location in survey area: Curry County, New Mexico; 1,600 feet east and 1,600 feet south of the northwest corner of section 30, T. 5 N., R. 33 E.; Latitude: 34 degrees 37 minutes 45 seconds N.; Longitude: 103 degrees 27 minutes 24 seconds W.

A—0 to 4 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; weak fine and medium subangular structure; soft, very friable, nonsticky and nonplastic; few medium and many fine roots; many fine interstitial pores; 5 percent caliche pebbles; strongly effervescent, moderately alkaline; clear, wavy boundary.

Bk—4 to 9 inches; brown (7.5YR 5/4) gravelly loam, dark brown (7.5YR 4/4) moist; weak fine subangular structure; soft, very friable, slightly sticky and slightly plastic; few medium and common fine roots; many fine interstitial and few fine tubular pores; 20 percent caliche pebbles; violently effervescent, moderately alkaline, abrupt wavy boundary.

BCk—9 to 19 inches; pink (7.5YR 8/3) gravelly loam, light brown (7.5YR 6/3) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few coarse tubular and common fine interstitial pores; 35 percent caliche fragments; violently effervescent, moderately alkaline; abrupt smooth boundary.

C—19 to 80 inches; pinkish white (7.5YR 8/2) extremely cobbly loam, pink (7.5YR 7/4) moist; cobbles consist of fragments of 75 percent fractured and unweathered caliche.

Range in Characteristics

Depth to fractured caliche: 9 to 16 inches

A horizon:
Hue: 7.5YR or 10YR
Value: 4 to 6, 3 to 5 moist
Chroma: 2 to 4
Content of coarse fragments: 5 to 10 percent

Bk horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 2 to 4
Texture: Loam
Content of coarse fragments (by volume): 15 to 30 percent

BCk and C horizon:
Hue: 7.5YR or 10YR
Value: 7 or 8, 6 or 7 moist
Chroma: 1 to 3
Texture: Fine sandy loam or loam
Content of coarse fragments (by volume): 35 to 75 percent

Ranco Series

Map unit(s): RcA
Depth class: Very deep
Drainage class: Poorly drained
Slowest permeability: 0.00 to 0.06 in/hr (very slow)
Landform: Playa floors
Parent material: Clayey lacustrine deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 1 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine, smectitic, thermic Ustic Epiaquerts

Typical Pedon

Map unit in which located: RcA, Ranco clay, 0 to 1 percent slopes; frequently ponded
Location in survey area: About 11 miles east of Fields, New Mexico; 300 feet east and 1,000 feet north of the southwest corner of section 27, T. 5 N., R. 34 E.;

Latitude: 34 degrees 37 minutes 18 seconds N.; Longitude: 103 degrees 20 minutes 06 seconds W.

A—0 to 5 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure parting to moderate fine granular; very hard, firm, sticky and plastic; few large and many fine roots; common fine pores; few fine masses of iron accumulation on ped surfaces; slightly alkaline; clear smooth boundary.

Bw—5 to 12 inches; very dark gray (10YR 3/1) clay, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to moderate medium angular; very hard, very firm, sticky and plastic; few large and common fine roots; common very fine pores; many pressure faces; few fine masses of iron accumulation on ped surfaces; moderately alkaline; clear wavy boundary.

Bss1—12 to 58 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm, sticky and plastic; few fine roots; common very fine pores; many pressure faces; few prominent slickensides; few fine faint iron-manganese concretions; slightly alkaline; gradual wavy boundary.

Bss2—58 to 80 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, firm, sticky and plastic; few fine roots; few very fine roots; many pressure faces and prominent slickensides; few fine faint iron-manganese concretions; slightly alkaline.

Range in Characteristics

A horizon:
Hue: 10YR
Value: 3 or 4, 2 or 3 moist
Chroma: 1
Redoximorphic accumulations: Masses of iron-manganese and oxidized rhizospheres range from few to many
Redoximorphic depletions: Iron depletions on faces of peds and in root pores range from none to common

Bw horizon: (where present)
Hue: N to 2.5Y
Value: 4 to 7, 3 to 6 moist. Note: After periods of prolonged saturation some pedons have neutral colors with moist color value of 4 to 6
Chroma: 1 or less
Redoximorphic accumulations: Masses of iron-manganese and oxidized rhizospheres range from few to many
Redoximorphic depletions: Iron depletions on faces of peds and in root pores range from none to common

Bss horizon:
Hue: 10YR
Value: 5 to 7, 4 to 6 moist
Chroma: 1 or 2

Randall Series

Map unit(s): RaA
Depth class: Very deep
Drainage class: Poorly drained
Slowest permeability: 0.00 to 0.06 in/hr (very slow)
Landform: Playa floors

Parent material: Clayey lacustrine deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 1 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine, smectitic, thermic Ustic Epiaquerts

Typical Pedon

Map unit in which located: RaA, Randall clay, 0 to 1 percent slopes, frequently ponded

Location in survey area: About 7 miles east of Fields, New Mexico; 1,750 feet east and 1,800 feet south of the northwest corner of section 29, T. 5 N., R. 32 E.; Latitude: 34 degrees 37 minutes 37 seconds N.; Longitude: 103 degrees 28 minutes 15 seconds W.

A1—0 to 4 inches; dark gray (10YR 4/1) clay, black (10YR 2/1) moist; weak fine angular blocky structure parting to moderate fine granular; hard, firm, sticky and plastic; few large and many fine roots; common fine pores; few fine masses of iron accumulation on ped surfaces; slightly alkaline; abrupt wavy boundary.

A2—4 to 17 inches; very dark gray (10YR 3/1) clay, very dark gray (10YR 3/1) moist; weak moderate angular blocky structure; very hard, firm, sticky and plastic; few large and common fine roots; common very fine pores; many pressure faces; few fine masses of iron accumulation on ped surfaces; moderately alkaline; gradual wavy boundary.

Bss1—17 to 28 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; moderate fine and medium angular blocky structure; very hard, firm, sticky and plastic; few fine roots; common very fine pores; many pressure faces; few prominent slickensides; few fine faint iron-manganese concretions; slightly alkaline; gradual wavy boundary.

Bss2—28 to 40 inches; gray (10YR 5/1) clay, dark grayish brown (10YR 4/2) moist; moderate fine and medium angular blocky structure; very hard, firm, sticky and plastic; few fine roots; few very fine roots; many pressure faces and prominent slickensides; few fine faint iron-manganese concretions; slightly alkaline; clear wavy boundary.

Bss3—40 to 80 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; weak coarse angular blocky structure; very hard, firm, sticky and plastic; many pressure faces and prominent slickensides; common soft masses of calcium carbonate lining peds; violently effervescent, moderately alkaline.

Range in Characteristics

A horizon:
Hue: 10YR
Value: 3 or 4, 2 or 3 moist
Chroma: 1
Redoximorphic concentrations: Few to many

Bss horizon:
Hue: 10YR
Value: 5, 4 moist
Chroma: 1 or 2

Redona Series

Map unit(s): 13, 31, 58, 60
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Landform: Alluvial flats, pediments
Parent material: Red bed alluvium derived from sandstone and shale, red bed eolian and alluvium derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 0 to 5 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Ustic Calciargids

Typical Pedon

Map unit in which located: 13, Tucumcari-Redona association, 0 to 5 percent slopes
Location in survey area: Quay County, New Mexico; 2,400 feet south and 950 feet west of the northeast corner of section 16, T. 8 N., R. 27 E.; Latitude: 34 degrees 55 minutes 09 seconds N.; Longitude: 104 degrees 04 minutes 57 seconds W.

A—0 to 4 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; common fine tubular pores; slightly alkaline; abrupt smooth boundary.
Bt—4 to 22 inches; reddish brown (5YR 4/4) loam, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; few very fine tubular pores; slightly alkaline; gradual smooth boundary.
Bk1—22 to 48 inches; reddish brown (5YR 5/4) loam, reddish brown (5YR 4/4) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; common fine and medium masses of calcium carbonate; violently effervescent; slightly alkaline; abrupt smooth boundary.
Bk2—48 to 80 inches; pink (5YR 8/4) loam, pink (5YR 7/4) moist; massive; hard, very friable, slightly sticky and slightly plastic; many large masses of calcium carbonate; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to calcic horizon: 20 to 40 inches

A horizon:
Hue: 5YR or 7.5YR
Value: 4 or 5, 3 or 4 moist
Chroma: 2 to 4
Texture: Fine sandy loam or sandy clay loam

Bt horizon:
Hue: 2.5YR or 5YR
Value: 4 to 6, 3 to 5 moist
Chroma: 4 to 6
Texture: Loam or sandy clay loam

Bk horizon:
Hue: 2.5YR or 5YR
Value: 5 to 8, 3 to 7 moist
Chroma: 3 to 6
Texture: Loam or sandy clay loam

Regnier Series

Map unit(s): 10, 32
Depth class: Shallow
*Drainage class: W*ell drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Pediments, scarp slopes
Parent material: Colluvium and slope alluvium derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 3 to 80 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Loamy, mixed, superactive, calcareous, thermic, shallow Ustic Torriorthents

Typical Pedon

Map unit in which located: 10, Regnier-Rock outcrop-Lacoca complex, 30 to 80 percent slopes
Location in survey area: Quay County, New Mexico; 1,400 feet south and 1,700 feet east of the northwest corner of section 3, T. 8 N., R. 27 E.; Latitude: 34 degrees 57 minutes 01 seconds N.; Longitude: 104 degrees 03 minutes 46 seconds W.

A—0 to 2 inches; brown (7.5YR 5/4) loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine and fine pores: disseminated carbonates; violently effervescent; abrupt smooth boundary.

C—2 to 13 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine pores; disseminated carbonates; violently effervescent: abrupt smooth boundary.

Cr—13 to 17 inches; reddish brown (2.5YR 4/4) weathered shale.

Range in Characteristics

Depth to shale: 12 to 20 inches

A horizon:
Hue: 5YR or 7.5YR
Value: 4 to 6, 3 to 5 moist
Chroma: 4 through 6
Texture: Loam, sandy clay loam, or gravelly loam

C horizon:
Hue: 5YR or 7.5YR
Value: 4 or 5, 3 or 4 moist
Chroma: 4 to 6
Texture: Loam or clay loam

Cr horizon: Consists or weathered shale interlayered with some sandstone

Roswell Series

Map unit(s): 61
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Landform: Dunes
Parent material: Eolian sands derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 5 to 15 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Mixed, thermic Ustic Torripsamments

Typical Pedon

(taken from the DeBaca County, New Mexico Soil Survey Report)

Map unit in which located: 61, Berwolf-Roswell association, 1 to 15 percent slopes
Location in adjoining survey area: About 12 miles south of Taiban, DeBaca County, New Mexico; 1,800 feet east and 1,100 feet north of southwest corner of section 36, T. 1 N., R. 27 E.; Latitude: 34 degrees 15 minutes 51 seconds N.; Longitude: 104 degrees 03 minutes 56 seconds W.

A—0 to 8 inches; brown (7.5YR 5/4) fine sand, brown (7.5YR 4/4) moist; single grain; loose; many fine and very fine roots; slightly alkaline; gradual smooth boundary.
C—8 to 60 inches; light reddish brown (5YR 6/4) fine sand, reddish brown (5YR 5/4) moist; single grain; loose; common fine and very fine roots; moderately alkaline.

Range in Characteristics

Depth to carbonates: Greater than 60 inches

A horizon:
Hue: 5YR or 7.5YR
Value: 5 or 6, 4 or 5 moist
Chroma: 4 to 6

C horizon:
Value: 5 or 6, 4 or 5 moist
Chroma: 4 to 6

San Jon Series

Map unit(s): 28
Depth class: Moderately deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Structural benches
Parent material: Red bed eolian and alluvium derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 5 to 20 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine-loamy, mixed, superactive, thermic Ustic Haplocalcids

Typical Pedon

Map unit in which located: 28, Lacoca-San Jon-Rock outcrop complex, 5 to 20 percent slopes
Location in survey area: Quay County, New Mexico; 2,050 feet west and 445 feet north of the southeast corner of section 19, T. 6 N., R. 27 E.; Latitude: 34 degrees 43 minutes 36 seconds N.; Longitude: 104 degrees 07 minutes 09 seconds W.

A—0 to 4 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; very fine and fine subangular blocky parting to very fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; few very fine pores; slightly alkaline; gradual smooth boundary.
Bw—4 to 20 inches; reddish brown (5YR 4/4) loam, reddish brown (5YR 4/4) moist; moderate medium and coarse subangular blocky parting to moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine pores; slightly alkaline; gradual smooth boundary.
Bk1—20 to 28 inches; reddish yellow (5YR 6/6) sandy clay loam, yellowish red (5YR 5/6) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and plastic; few very fine pores; strongly effervescent; moderately alkaline; abrupt smooth boundary.
Bk2—28 to 35 inches; pink (5YR 7/4) loam, light reddish brown (5YR 6/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine masses of calcium carbonate; violently effervescent; moderately alkaline; abrupt smooth boundary.
R—35 to 60 inches; sandstone bedrock.

Range in Characteristics

Depth to interbedded sandstone, shale, and siltstone: 20 to 40 inches

A horizon:
Hue: 5YR or 7.5YR
Value: 5 or 6, 4 or moist
Chroma: 3 or 4

Bw and Bk horizon:
Hue: 2.5YR or 5YR
Value: 4 to 7, 3 to 6 moist
Chroma: 4 to 6
Texture: Loam or sandy clay loam

Slaughter Series

Map unit(s): SaA
Depth class: Very shallow to shallow
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Low hills, plains
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 2 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days

Taxonomic class: Clayey, mixed, superactive, thermic, shallow Petrocalcic Paleustolls

Typical Pedon

Map unit in which located: SaA, Slaughter loam, 0 to 2 percent slopes
Location in survey area: Curry County, New Mexico; 50 feet east and 1,000 feet south of the northwest corner of section 6, T. 3 N., R. 31 E.; Latitude: 34 degrees 27 minutes 38 seconds N.; Longitude: 103 degrees 40 minutes 07 seconds W.

A—0 to 6 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/3) moist; weak fine subangular blocky structure; hard, friable, nonsticky and nonplastic; many fine roots few fine pores; neutral, abrupt smooth boundary.
Bt1—6 to 12 inches; brown (7.5YR 4/3) clay loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; many fine roots; few fine and medium pores; many distinct clay films on ped faces; neutral, clear smooth boundary.
Bt2—12 to 18 inches; reddish brown (5YR 4/3) clay loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; few fine roots; few fine and medium pores; many distinct clay films on ped faces; neutral, abrupt wavy boundary.
Bkm—18 to 30 inches; indurated caliche.
BCk—30 to 80 inches; light brown (7.5YR 6/3) sandy clay loam, brown (7.5YR 5/3) moist; weak fine subangular blocky structure; hard, friable, slightly sticky and nonplastic; few fine roots, few fine pores; many masses of calcium carbonate, few hard calcium carbonate concretions; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to petrocalcic horizon: 12 to 20 inches

A horizon:
Hue: 5YR or 7.5YR
Value: 4 or 5, 3 or 4 moist
Chroma: 2 or 3

Bt horizon:
Hue: 5YR or 7.5YR
Value: 4 or 5, 3 or 4 moist
Chroma: 2 to 4
Texture: Clay loam or clay

Bkm horizon: Consists of indurated caliche from several inches to several feet thick.

BCk horizon: Extremely variable in texture and color.

Spantara Series

Map unit(s): SnC
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Landform: Plains, playa slopes
Parent material: Coarse-loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 1 to 5 percent

Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Coarse-loamy, mixed, superactive, thermic Aridic Haplustalfs

Typical Pedon

Map unit in which located: SnC, Spantara fine sand, 1 to 5 percent slopes
Location in survey area: Curry County, New Mexico; 1,000 feet south and 50 feet east of the northwest corner of section 17, T. 2 N., R. 32 E.; Latitude: 34 degrees 24 minutes 10 seconds N.; Longitude: 103 degrees 36 minutes 58 seconds W.

A1—0 to 3 inches; dark yellowish brown (10YR 4/4) fine sand, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine roots; few fine and medium pores; neutral; abrupt smooth boundary.

A2—3 to 10 inches; brown (10YR 5/3) fine sand, dark yellowish brown (10YR 4/4) moist; weak medium and coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots; few fine and medium pores; neutral; abrupt smooth boundary.

Bt1—10 to 17 inches; brown (7.5YR 5/4) fine sand, strong brown (7.5YR 5/6) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few fine roots; few fine and medium pores; few faint clay films on ped surface; neutral; clear smooth boundary.

Bt2—17 to 24 inches; reddish brown (5YR 5/3) loamy fine sand, reddish brown (5YR 4/4) moist; moderate medium subangular structure; slightly hard, very friable, nonsticky and nonplastic; few fine roots; few fine and medium pores; many prominent clay films; slightly alkaline; clear smooth boundary.

Bt3—24 to 34 inches; reddish brown (5YR 4/4) fine sandy loam, yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few fine roots; common fine and medium pores; many prominent clay films; slightly alkaline; clear smooth boundary.

Bt4—34 to 45 inches; reddish brown (5YR 5/4) fine sandy loam, yellowish red (5YR 5/6) moist; moderate medium subangular blocky structure; hard, friable, nonsticky and nonplastic; few fine roots; common fine and medium pores; many distinct clay films; slightly alkaline; clear smooth boundary.

Bt5—45 to 80 inches; reddish brown (5YR 5/4) loamy fine sand, yellowish red (5YR 5/6) moist; weak medium subangular blocky structure; hard, friable, nonsticky and nonplastic; few fine and medium pores; common distinct clay films; few fine irregular-shaped masses of calcium carbonate; slightly effervescent; moderately alkaline.

Range in Characteristics

A horizon:
Hue: 5YR to 10YR
Value: 4 or 5, 3 or 4 moist
Chroma: 3 to 6
Texture: Fine sand or loamy fine sand

Bt horizon:
Hue: 5YR or 7.5YR
Value: 4 to 6, 3 to 5 moist
Chroma: 3 to 6
Texture: Loamy fine sand, fine sandy loam, or sandy clay loam

Sparenberg Series

Map unit(s): SpA
Depth class: Very deep
Drainage class: Somewhat poorly drained
Slowest permeability: 0.00 to 0.06 in/hr (very slow)
Landform: Playa floors
Parent material: Clayey lacustrine deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 1 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine, smectitic, thermic Udic Haplusterts

Typical Pedon

Map unit in which located: SpA, Sparenberg clay, 0 to 1 percent slopes, occasionally ponded

Location in survey area: Curry County, New Mexico; 175 feet west and 400 feet south of the northeast corner of section 14, T. 5 N., R. 32 E.; Latitude: 34 degrees 39 minutes 41 seconds N.; Longitude: 103 degrees 31 minutes 17 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; hard, firm, sticky and plastic; few large and many fine roots; common fine pores; slightly alkaline; abrupt smooth boundary.

Bw—4 to 12 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; weak medium prismatic structure parting to strong angular blocky; very hard, firm, sticky and plastic; few large and common fine roots; common very fine pores; common fine masses of calcium carbonate; slightly effervescent; moderately alkaline; gradual wavy boundary.

Bss1—12 to 31 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; weak coarse prismatic structure parting to strong medium angular blocky; very hard, firm, sticky and plastic; few fine roots; common very fine pores; many pressure faces; few prominent slickensides; few fine masses of carbon; slightly effervescent; moderately alkaline; gradual, wavy boundary.

Bss2—31 to 46 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; strong medium angular blocky structure; very hard, firm, sticky and plastic; few fine roots; few very fine roots; many pressure faces and prominent slickensides; slightly effervescent; slightly alkaline; clear wavy boundary.

Bkss—46 to 80 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; weak coarse angular blocky structure; very hard, firm, sticky and plastic; many pressure faces and distinct slickensides; common soft masses of calcium carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

A horizon:
Hue: 10YR
Value: 3 or 4, 2 or 3 moist
Chroma: 1 to 3

Bw horizon:
Hue: 10YR or 2.5YR
Value: 2 to 4 moist, 3 to 5 dry; where moist color values are 4, they comprise less than 50 percent of the matrix
Chroma: 1 or 2

Bss horizon:
Hue: 10YR
Value: 3 to 5, 2 to 4 moist
Chroma: 1 or 2
Redoximorphic features: None or few

Bkss horizon:
Hue: 10YR
Value: 4 to 6, 3 to 5 moist
Chroma: 1 or 2
Redoximorphic features: None or few

Sparks Series

Map unit(s): SsA
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Landform: Plains
Parent material: Loamy eolian deposits
Elevation: 4,100 to 5,300 feet (1,250 to 1,615 meters)
Slope: 0 to 2 percent
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine, mixed, superactive, thermic Aridic Paleustalfs

Typical Pedon

Map unit in which located: SsA, Sparks loam, 0 to 2 percent slopes
Location in survey area: Quay County, New Mexico; 2,200 feet south and 2,200 feet west of the northeast corner of section 19, T. 7 N., R. 27 E.; Latitude: 34 degrees 49 minutes 00 seconds N.; Longitude: 104 degrees 07 minutes 10 seconds.

Ap—0 to 6 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 3/3) moist; weak fine platy structure; friable, very friable, slightly sticky and slightly plastic; few fine roots, few fine pores; neutral; abrupt smooth boundary.

Bt1—6 to 18 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and slightly plastic; common fine roots and pores; moderately thick clay films on ped faces and in pores; neutral; clear wavy boundary.

Bt2—18 to 42 inches; light reddish brown (5YR 6/4) clay loam, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to weak medium subangular block; hard, firm, sticky and slightly plastic; few fine roots and pores; moderately thick clay films on ped faces and in pores, neutral; clear wavy boundary.

Btk—42 to 80 inches; pink (5YR 7/4) clay loam, light reddish brown (5YR 6/4) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine roots and few fine pores; thin clay films on ped faces and in pores; common films of calcium carbonate on ped faces, violently effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 33 to 60 inches

A horizon:
Hue: 7.5YR
Value: 3 to 5, 2 or 3 moist
Chroma: 3 or 4

Bt horizon:
Hue: 5YR or 7.5YR
Value: 4 to 6, 3 or 4 moist
Chroma: 4 or 5
Texture: Clay loam or clay

Btk horizon:
Hue: 5YR or 7.5YR
Value: 5 to 7, 4 to 6 moist
Chroma: 3 to 6

Tucumcari Series

Map unit(s): 11, 13
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Landform: Pediments, swales
Parent material: Red bed alluvium derived from sandstone and shale
Elevation: 4,400 to 5,300 feet (1,341 to 1,615 meters)
Slope: 0 to 3 percent
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 57 to 63 degrees F (14.0 to 17.0 degrees C)
Freeze-free period: 180 to 200 days
Taxonomic class: Fine, smectitic, thermic Ustertic Haplargids

Typical Pedon

Map unit in which located: 11, Tucumcari-Hassell clay loams, 0 to 5 percent slopes
Location in survey area: Quay County, New Mexico; 250 feet south and 1,000 feet east of the northwest corner of section 32, T. 6 N., R. 27 E.; Latitude: 34 degrees 42 minutes 22 seconds N.; Longitude: 104 degrees 06 minutes 20 seconds W.

A—0 to 3 inches; reddish brown (5YR 5/3) clay loam, reddish brown (5YR 4/3) moist; weak very fine and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; few very fine and fine pores; moderately alkaline; clear smooth boundary.
Btk—3 to 25 inches; reddish brown (5YR 4/3) clay loam, reddish brown (5YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine and fine roots; few very fine and fine pores; common distinct clay films on ped faces and lining pores; few fine threads and disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
Bk—25 to 80 inches; reddish brown (5YR 5/4) clay loam, reddish brown (5YR 4/4) moist; weak fine and medium subangular blocky structure; few very fine

and fine roots; few very fine pores; few fine soft masses of calcium carbonate; violently effervescent; moderately alkaline.

Range in Characteristics

A horizon:
Hue: 5YR or 7.5YR
Value: 3 to 5, 2 to 4 moist
Chroma: 3 or 4

Btk and Bk horizon:
Hue: 5YR or 7.5YR
Value: 4 to 6, 3 to 5 moist
Chroma: 3 to 6

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "National Soil Survey Handbook" (available in local offices of the Natural Resources Conservation Service or on the Internet).

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.

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.

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 hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

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.

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.

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.

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.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. See Redoximorphic features.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A dense, compact, slowly permeable subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex, 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.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion (geomorphology). A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations). Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Cutbanks cave (in tables)**.** The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

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.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

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.

Dune. A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

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.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Forb. Any herbaceous plant not a grass or a sedge.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microlows (microbasins) and microhighs (microknolls) in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

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.

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.

Hillslope. 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.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

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

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.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K-sat. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain. A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace. A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Large stones (in tables)**.** Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength. The soil is not strong enough to support loads.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. 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.

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).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. See Redoximorphic features.

Nose slope (geomorphology). A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon. The smallest volume that can be called "a soil." A pedon is three-dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 00.0015 inch
Very slow	00.0015 to 00.06 inch
Slow	00.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables)**.** Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

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.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings. See Redoximorphic features.

Potential 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

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   a. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; and
   b. Masses, which are noncemented concentrations of substances within the soil matrix; and
   c. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   a. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; and
   b. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix. See Redoximorphic features.

Regolith. All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill. A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saturated hydraulic conductivity (K-sat). See Permeability.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Sedimentary rock. A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell (in tables)**.** The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune. A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slickensides (pedogenic). Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

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.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na+ to Ca ++ + Mg++. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless soils are either single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Terrace (conservation). An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology). A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

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 hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope 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 hillslope continuum.

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 Clovis, New Mexico)

Month	Temperature (Degrees F)					Precipitation (Inches)					
				2 years in 10 will have				2 years in 10 will have			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than	Minimum temperature less than	Average number of growing degree days*	Average	less than	more than	Average number of days w/.1 or more	Average total snow fall
January	50.5	23.6	37.0	74	2	7	0.49	0.06	0.87	1	3.8
February	56.4	27.5	42.0	78	5	27	0.42	0.07	0.76	1	2.9
March	63.8	33.0	48.4	84	12	90	0.67	0.15	1.03	1	1.0
April	71.5	40.5	56.0	90	23	225	1.03	0.22	1.74	2	0.4
May	80.1	50.5	65.3	96	35	477	1.93	0.50	3.33	3	0.0
June	88.3	59.3	73.8	104	46	715	2.62	1.17	4.06	4	0.0
July	90.5	63.4	77.0	102	54	836	2.59	1.27	3.72	4	0.0
August	87.9	62.0	75.0	99	54	774	3.51	1.53	5.29	6	0.0
September	81.9	55.0	68.4	97	36	557	2.17	0.89	3.45	4	0.0
October	72.4	43.8	58.1	91	25	278	1.76	0.25	2.90	3	0.4
November	60.1	32.5	46.3	81	12	64	0.75	0.12	1.39	2	1.9
December	51.7	25.0	38.3	73	2	11	0.70	0.17	1.09	1	3.6
Yearly:											
Average	71.3	43.0	57.1	---	---	---	---	---	---	---	---
Extreme	110	-7	---	105	-3	---	---	---	---	---	---
Total	---	---	---	---	---	4,061	18.64	14.85	29.63	32	14.0

Average number of days per year with at least 1 inch of snow on the ground: 11

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minumum 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 Clovis, New Mexico)

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 7	April 15	April 30
2 years in 10 later than--	April 2	April 10	April 25
5 years in 10 later than--	March 23	April 1	April 15
First freezing temperature in fall:			
1 year in 10 earlier than--	November 2	October 17	October 14
2 years in 10 earlier than--	November 7	October 23	October 18
5 years in 10 earlier than--	November 17	November 3	October 27

Table 3.--Growing Season

(Recorded for the period 1971-2000 at Clovis, New Mexico)

Probability	Daily Minimum Temperature		
	Number of days less than 24°F	Number of days less than 28°F	Number of days less than 32°F
9 years in 10	217	191	175
8 years in 10	224	199	182
5 years in 10	238	215	193
2 years in 10	253	230	205
1 year in 10	260	238	211

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
10	Regnier-Rock outcrop-Lacoca complex, 30 to 80 percent slopes	12,235	0.9
11	Tucumcari-Hassell clay loams, 0 to 5 percent slopes	2,907	0.2
13	Tucumcari-Redona association, 0 to 5 percent slopes	3,716	0.3
28	Lacoca-San Jon-Rock outcrop complex, 5 to 20 percent slopes	2,042	0.2
31	Chispa-Redona association, 0 to 3 percent slopes	11,937	0.9
32	Regnier-Lacoca-Rock outcrop complex, 3 to 25 percent slopes	176	*
36	Alama silt loam, 1 to 5 percent slopes	2,234	0.2
37	Ima-Gallen association, 2 to 7 percent slopes	767	*
58	Redona-Armesa association, 0 to 5 percent slopes	926	*
60	Chispa-Armesa-Redona association, 2 to 7 percent slopes	1,968	0.1
61	Berwolf-Roswell association, 1 to 15 percent slopes	247	*
AcA	Acuff loam, 0 to 1 percent slopes	280,551	21.1
AcB	Acuff loam, 1 to 3 percent slopes	42,663	3.2
AfA	Amarillo fine sandy loam, 0 to 1 percent slopes	161,742	12.1
AfB	Amarillo fine sandy loam, 1 to 3 percent slopes	12,605	0.9
AnB	Amarillo loamy fine sand, 1 to 3 percent slopes	55,994	4.2
AvA	Arvana fine sandy loam, 0 to 1 percent slopes	2,328	0.2
BcA	Bippus clay loam, 0 to 2 percent slopes, occasionally flooded	14,184	1.1
DRC	Drake soils, 1 to 8 percent slopes	5,167	0.4
EsA	Estacado loam, 0 to 1 percent slopes	50,750	3.8
EsB	Estacado loam, 1 to 3 percent slopes	37,712	2.8
FrA	Friona loam, 0 to 1 percent slopes	3,201	0.2
GoB	Gomez loamy fine sand, 0 to 3 percent slopes	9,505	0.7
GrA	Grier clay, 0 to 2 percent slopes	1,223	*
KmB	Kimberson gravelly loam, 0 to 3 percent slopes	27,183	2.0
LcA	Lazbuddie clay, 0 to 1 percent slopes	4,603	0.3
LoA	Lofton clay loam, 0 to 1 percent slopes	1,629	0.1
McA	McLean clay, 0 to 1 percent slopes, occasionally ponded	1,634	0.1
MsD	Milsand loamy fine sand, 1 to 8 percent slopes	4,049	0.3
MsE	Milsand-Arch complex, 1 to 20 percent slopes	12,437	0.9
NtC	Nutivoli fine sand, 3 to 8 percent slopes	4,785	0.4
NtD	Nutivoli fine sand, 5 to 12 percent slopes	9,490	0.7
OcA	Olton clay loam, 0 to 1 percent slopes	296,102	22.2
OcB	Olton clay loam, 1 to 3 percent slopes	15,775	1.2
PcA	Pep clay loam, 0 to 1 percent slopes	18	*
PcB	Pep clay loam, 1 to 3 percent slopes	1,293	*
PeA	Pep loam, 0 to 1 percent slopes	24,601	1.8
PeB	Pep loam, 1 to 3 percent slopes	18,969	1.4
PMG	Potter-Mobeetie association, 8 to 45 percent slopes	12,918	1.0
PoA	Portales loam, 0 to 1 percent slopes	4,350	0.3
PsA	Posey fine sandy loam, 0 to 1 percent slopes	2,700	0.2
PsB	Posey fine sandy loam, 1 to 3 percent slopes	20,129	1.5
PsC	Posey fine sandy loam, 3 to 8 percent slopes	17,678	1.3
RaA	Randall clay, 0 to 1 percent slopes, frequently ponded	2,547	0.2
RcA	Ranco clay, 0 to 1 percent slopes, frequently ponded	768	*
SaA	Slaughter loam, 0 to 2 percent slopes	7,652	0.6
SnC	Spantara fine sand, 1 to 5 percent slopes	29,194	2.2
SpA	Sparenberg clay, 0 to 1 percent slopes, occasionally ponded	1,175	*
SsA	Sparks loam, 0 to 2 percent slopes	92,939	7.0
W	Water	162	*
	Total	1,331,560	100.0

* Less than 0.1 percent.

Table 5.--Irrigated and Nonirrigated Yields by Map Unit Component

(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		Corn		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu
10:								
Regnier	7e	---	---	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---	---	---
Lacoca	7s	---	---	---	---	---	---	---
11:								
Tucumcari	6e	---	---	---	---	105.00	---	50.00
Hassell	6c	---	---	---	---	---	---	---
13:								
Tucumcari	6e	---	---	---	---	105.00	---	50.00
Redona	6e	---	---	---	---	115.00	---	50.00
28:								
Lacoca	7s	---	---	---	---	---	---	---
San Jon	6e	---	---	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---	---	---
31:								
Chispa	6s	---	---	---	---	---	---	---
Redona	6e	3e	---	---	---	110.00	---	40.00
32:								
Regnier	6c	---	---	---	---	---	---	---
Lacoca	7s	---	---	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---	---	---
36:								
Alama	6e	---	---	---	---	---	---	---
37:								
Ima	6c	4e	---	---	---	70.00	---	---
Gallen	6s	---	---	---	---	---	---	---
58:								
Redona	6e	2e	---	---	---	115.00	---	50.00
Armesa	6e	---	---	---	---	---	---	---
60:								
Chispa	6s	---	---	---	---	---	---	---
Armesa	6e	---	---	---	---	---	---	---
Redona	6e	4e	---	---	---	85.00	---	---

Table 5.--Irrigated and Nonirrigated Yields by Map Unit Component--Continued

Map symbol and soil name	Land capability		Corn		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu
61:								
Berwolf	6c	---	---	---	---	---	---	---
Roswell	7e	---	---	---	---	---	---	---
AcA:								
Acuff	4c	1	---	200.00	30.00	110.00	24.00	70.00
AcB:								
Acuff	4c	2e	---	200.00	20.00	110.00	20.00	70.00
AfA:								
Amarillo	4c	2e	---	200.00	25.00	110.00	22.00	70.00
AfB:								
Amarillo	4c	2e	---	200.00	24.00	110.00	20.00	70.00
AnB:								
Amarillo	4c	3e	---	190.00	20.00	100.00	15.00	65.00
AvA:								
Arvana	6e	3e	---	170.00	20.00	85.00	12.00	55.00
BcA:								
Bippus	4c	2w	---	200.00	30.00	110.00	24.00	70.00
DRC:								
Drake	6e	---	---	---	25.00	---	14.00	---
EsA:								
Estacado	4c	2e	---	170.00	20.00	90.00	15.00	55.00
EsB:								
Estacado	4c	3e	---	170.00	17.00	80.00	20.00	55.00
FrA:								
Friona	4c	3e	---	170.00	18.00	80.00	10.00	50.00
GoB:								
Gomez	4e	3e	---	190.00	17.00	70.00	14.00	60.00
GrA:								
Grier	5w	---	---	---	---	---	---	---
KmB:								
Kimberson	7s	---	---	160.00	15.00	60.00	10.00	45.00
LcA:								
Lazbuddie	5w	---	---	---	---	---	---	---
LoA:								
Lofton	4c	1	---	190.00	22.00	110.00	20.00	65.00
McA:								
McLean	4w	---	---	---	---	---	---	---
MsD:								
Milsand	6e	---	---	---	---	---	---	---

Table 5.--Irrigated and Nonirrigated Yields by Map Unit Component--Continued

Map symbol and soil name	Land capability		Corn		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu
MsE:								
Milsand	6e	---	---	---	---	---	---	---
Arch	6e	---	---	---	---	---	---	---
NtC:								
Nutivoli	6e	---	---	---	---	---	---	---
NtD:								
Nutivoli	6e	---	---	---	---	---	---	---
OcA:								
Olton	4c	2s	---	190.00	30.00	110.00	18.00	65.00
OcB:								
Olton	4c	2e	---	190.00	25.00	110.00	15.00	65.00
PcA:								
Pep	4c	2e	---	140.00	18.00	60.00	16.00	40.00
PcB:								
Pep	4c	3e	---	130.00	16.00	55.00	14.00	35.00
PeA:								
Pep	4c	2e	---	170.00	30.00	100.00	20.00	55.00
PeB:								
Pep	4c	3e	---	170.00	24.00	100.00	20.00	55.00
PMG:								
Potter	7s	---	---	---	---	---	---	---
Mobeetie	7e	---	---	---	---	---	---	---
PoA:								
Portales	4c	2e	---	170.00	25.00	100.00	20.00	55.00
PsA:								
Posey	4c	2e	---	170.00	20.00	70.00	15.00	55.00
PsB:								
Posey	4c	3e	---	170.00	15.00	70.00	12.00	50.00
PsC:								
Posey	4e	4e	---	150.00	12.00	65.00	10.00	50.00
RaA:								
Randall	6w	---	---	---	---	---	---	---
RcA:								
Ranco	6w	---	---	---	---	---	---	---
SaA:								
Slaughter	6s	4s	---	---	15.00	---	10.00	---
SnC:								
Spantara	4e	3e	---	190.00	16.00	80.00	14.00	65.00
SpA:								
Sparenberg	4w	---	---	---	---	---	---	---

Table 5.--Irrigated and Nonirrigated Yields by Map Unit Component--Continued

Map symbol and soil name	Land capability		Corn		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu
SsA:								
Sparks	4c	2e	---	190.00	24.00	110.00	20.00	65.00
W:								
Water	---	---	---	---	---	---	---	---

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
10:				
Regnier	Breaks North Exposure R070XB059NM	1,400	800	600
Rock outcrop	---	---	---	---
Lacoca	Breaks North Exposure R070XB059NM	1,100	700	400
11:				
Tucumcari	Clayey R070XB053NM	1,500	900	500
Hassell	Clayey R070XB053NM	1,500	900	500
13:				
Tucumcari	Clayey R070XB053NM	1,500	900	500
Redona	Loamy R070XB052NM	1,600	1,000	700
28:				
Lacoca	Sandstone Savannah R070XB051NM	1,200	750	400
San Jon	Loamy R070XB052NM	1,600	1,000	700
Rock outcrop	---	---	---	---
31:				
Chispa	Sandy Loam R070XB054NM	750	550	300
Redona	Sandy Loam R070XB054NM	1,600	1,100	700
32:				
Regnier	Red Shale R070XB071NM	1,000	700	500
Lacoca	Shallow Sandstone R070XB072NM	1,100	700	400
Rock outcrop	---	---	---	---
36:				
Alama	Loamy R070XB052NM	1,600	1,000	700
37:				
Ima	Sandy Loam R070XB054NM	1,600	1,100	700
Gallen	Gravelly R070XB065NM	1,450	950	450

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
58:				
Redona	Loamy R070XB052NM	1,600	1,000	700
Armesa	Limy R070XB068NM	1,400	---	500
60:				
Chispa	Sandy Loam R070XB054NM	750	550	300
Armesa	Limy R070XB068NM	1,400	---	500
Redona	Sandy Loam R070XB054NM	1,600	1,100	700
61:				
Berwolf	Sandy Plains R070XB055NM	3,000	2,100	1,500
Roswell	Sandhills R070XB061NM	2,500	1,700	1,100
AcA:				
Acuff	Deep Hardland PE 25-36 R077CY022TX	1,800	1,500	800
AcB:				
Acuff	Deep Hardland PE 25-36 R077CY022TX	1,800	1,500	800
AfA:				
Amarillo	Sandy Loam PE 25-36 R077CY036TX	2,000	1,400	800
AfB:				
Amarillo	Sandy Loam PE 25-36 R077CY036TX	2,000	1,400	800
AnB:				
Amarillo	Sandy PE 25-36 R077CY035TX	2,000	1,500	800
AvA:				
Arvana	Sandy Loam PE 25-36 R077CY036TX	2,200	1,700	1,200
BcA:				
Bippus	Draw PE 25-36 R077CY023TX	3,000	2,400	1,500
DRC:				
Drake	High Lime PE 25-36 R077CY026TX	1,800	1,300	900
EsA:				
Estacado	Limy Upland PE 25-36 R077CY028TX	1,800	1,500	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
EsB:				
Estacado	Limy Upland PE 25-36 R077CY028TX	1,600	1,100	700
FrA:				
Friona	Deep Hardland PE 25-36 R077CY022TX	1,800	1,500	800
GoB:				
Gomez	Sandy PE 25-36 R077CY035TX	2,400	1,500	800
GrA:				
Grier	Wet Saline PE 25-36 R077CY689TX	2,200	1,800	1,000
KmB:				
Kimberson	Very Shallow PE 25-36 R077CY037TX	1,400	1,000	700
LcA:				
Lazbuddie	Playa PE 25-36 R077CY027TX	3,000	1,200	500
LoA:				
Lofton	Deep Hardland PE 25-36 R077CY022TX	1,750	1,250	700
McA:				
McLean	Playa PE 25-36 R077CY027TX	3,000	1,200	500
MsD:				
Milsand	Sand Hills PE 25-36 R077EY063TX	2,400	1,750	1,200
MsE:				
Milsand	Sand Hills PE 25-36 R077CY034TX	2,400	1,750	1,200
Arch	High Lime PE 25-36 R077CY026TX	1,500	1,200	800
NtC:				
Nutivoli	Sand Hills PE 25-36 R077CY034TX	2,400	1,750	1,200
NtD:				
Nutivoli	Sand Hills PE 25-36 R077CY034TX	2,400	1,750	1,200
OcA:				
Olton	Deep Hardland PE 25-36 R077CY022TX	1,800	1,500	800
OcB:				
Olton	Deep Hardland PE 25-36 R077CY022TX	1,800	1,500	800
PcA:				
Pep	Limy Upland PE 25-36 R077CY028TX	2,000	1,300	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
PcB:				
Pep	Limy Upland PE 25-36 R077CY028TX	2,000	1,300	800
PeA:				
Pep	Limy Upland PE 25-36 R077CY028TX	1,800	1,500	800
PeB:				
Pep	Limy Upland PE 25-36 R077CY028TX	1,800	1,500	800
PMG:				
Potter	Very Shallow PE 25-36 R077EY068TX	1,200	900	500
Mobeetie	Mixedland Slopes PE 25-36 R077EY061TX	1,800	1,200	900
PoA:				
Portales	Limy Upland PE 25-36 R077CY028TX	1,800	1,500	800
PsA:				
Posey	Limy Upland PE 25-36 R077CY028TX	1,800	1,500	800
PsB:				
Posey	Limy Upland PE 25-36 R077CY028TX	1,800	1,500	800
PsC:				
Posey	Limy Upland PE 25-36 R077CY028TX	1,800	1,500	800
RaA:				
Randall	Playa PE 25-36 R077CY027TX	3,000	1,200	500
RcA:				
Ranco	Playa PE 25-36 R077CY027TX	3,000	1,200	500
SaA:				
Slaughter	Very Shallow PE 25-36 R077CY037TX	1,400	1,000	700
SnC:				
Spantara	Sandy PE 25-36 R077CY035TX	2,400	1,500	800
SpA:				
Sparenberg	Playa PE 25-3 R077CY027TX	3,000	1,200	500
SsA:				
Sparks	Deep Hardland PE 25-36 R077CY022TX	1,800	1,500	800
W:				
Water	---	---	---	---

Table 7.--Camp Areas, Picnic Areas, and Playgrounds

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
10:							
Regnier	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
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Gravel content	0.06
Rock outcrop	30	Not rated		Not rated		Not rated	
Lacoca	20	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
11:							
Tucumcari	50	Not limited		Not limited		Not limited	
Hassell	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.41	Slow water movement	0.41	Slow water movement	0.41
						Depth to bedrock	0.29
						Slope	0.12
13:							
Tucumcari	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Redona	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.12
28:							
Lacoca	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.84	Slope	0.84	Slope	1.00
						Gravel content	0.32
San Jon	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Depth to bedrock	0.20
						Gravel content	0.06
Rock outcrop	15	Not rated		Not rated		Not rated	
31:							
Chispa	50	Not limited		Not limited		Not limited	
Redona	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.01	Too sandy	0.01	Too sandy	0.01

Table 7.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
32:							
Regnier	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Gravel content	0.06
Lacoca	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
Rock outcrop	15	Not rated		Not rated		Not rated	
36:							
Alama	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.12
37:							
Ima	70	Not limited		Not limited		Somewhat limited	
						Slope	0.50
Gallen	20	Somewhat limited		Somewhat limited		Very limited	
		Gravel content	0.22	Gravel content	0.22	Gravel content	1.00
						Slope	0.88
58:							
Redona	50	Not limited		Not limited		Somewhat limited	
						Slope	0.12
Armesa	25	Not limited		Not limited		Somewhat limited	
						Slope	0.12
60:							
Chispa	40	Not limited		Not limited		Somewhat limited	
						Slope	0.50
Armesa	30	Not limited		Not limited		Somewhat limited	
						Slope	0.88
Redona	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.01	Too sandy	0.01	Slope	0.50
						Too sandy	0.01
61:							
Berwolf	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.70	Too sandy	0.70	Too sandy	0.70
						Slope	0.12
Roswell	20	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
AcA:							
Acuff	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Dusty	0.50	Dusty	0.50	Dusty	0.50

Table 7.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
AfA:							
Amarillo	85	Not limited		Not limited		Not limited	
AfB:							
Amarillo	85	Not limited		Not limited		Not limited	
AnB:							
Amarillo	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.70	Too sandy	0.70	Too sandy	0.70
AvA:							
Arvana	85	Somewhat limited		Somewhat limited		Not limited	
		Depth to cemented pan	0.35	Depth to cemented pan	0.35		
BcA:							
Bippus	85	Very limited		Not limited		Not limited	
		Flooding	1.00				
DRC:							
Drake	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.88
						Dusty	0.50
EsA:							
Estacado	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
EsB:							
Estacado	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
FrA:							
Friona	85	Somewhat limited		Somewhat limited		Not limited	
		Depth to cemented pan	0.46	Depth to cemented pan	0.46		
GoB:							
Gomez	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.72	Too sandy	0.72	Too sandy	0.72
GrA:							
Grier	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Slow water movement	0.96	Slow water movement	0.96	Slow water movement	0.96
		Depth to saturated zone	0.10	Depth to saturated zone	0.05	Depth to saturated zone	0.10
KmB:							
Kimberson	90	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Gravel content	1.00
		Gravel content	0.62	Gravel content	0.62	Depth to cemented pan	1.00

Table 7.--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
LcA:							
Lazbuddie	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
LoA:							
Lofton	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.41	Slow water movement	0.41	Slow water movement	0.41
McA:							
McLean	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
MsD:							
Milsand	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.79	Too sandy	0.79	Slope	0.88
						Too sandy	0.79
MsE:							
Milsand	50	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Arch	40	Not limited		Not limited		Somewhat limited	
						Slope	0.12
NtC:							
Nutivoli	90	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
						Slope	0.88
NtD:							
Nutivoli	85	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
OcA:							
Olton	95	Not limited		Not limited		Not limited	
OcB:							
Olton	85	Not limited		Not limited		Not limited	
PcA:							
Pep	85	Not limited		Not limited		Not limited	
PcB:							
Pep	85	Not limited		Not limited		Not limited	
PeA:							
Pep	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
PeB:							
Pep	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50

Table 7.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
PMG:							
Potter	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
Mobeetie	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
PoA:							
Portales	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
PsA:							
Posey	85	Not limited		Not limited		Not limited	
PsB:							
Posey	90	Not limited		Not limited		Not limited	
PsC:							
Posey	90	Not limited		Not limited		Very limited	
						Slope	1.00
RaA:							
Randall	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
RcA:							
Ranco	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
SaA:							
Slaughter	85	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
SnC:							
Spantara	85	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
						Slope	0.12
SpA:							
Sparenberg	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45

Table 7.--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
SsA:							
Sparks	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Slow water movement	0.41	Slow water movement	0.41	Slow water movement	0.41
W:							
Water	100	Not rated		Not rated		Not rated	

Table 8--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: 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
10:							
Regnier	35	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00	Droughty	1.00
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
Lacoca	20	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
11:							
Tucumcari	50	Not limited		Not limited		Not limited	
Hassell	40	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.29
13:							
Tucumcari	50	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Redona	40	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
28:							
Lacoca	35	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	1.00
						Slope	0.84
						Large stones content	0.68
San Jon	30	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.84
		Dusty	0.50	Dusty	0.50	Depth to bedrock	0.20
Rock outcrop	15	Not rated		Not rated		Not rated	
31:							
Chispa	50	Not limited		Not limited		Not limited	
Redona	40	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.01	Too sandy	0.01		

Table 8.--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
32:							
Regnier	40	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Droughty	1.00
						Slope	0.63
Lacoca	30	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
Rock outcrop	15	Not rated		Not rated		Not rated	
36:							
Alama	90	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
37:							
Ima	70	Not limited		Not limited		Not limited	
Gallen	20	Not limited		Not limited		Somewhat limited	
						Droughty	0.85
						Gravel content	0.22
						Large stones content	0.01
58:							
Redona	50	Not limited		Not limited		Not limited	
Armesa	25	Not limited		Not limited		Very limited	
						Carbonate content	1.00
60:							
Chispa	40	Not limited		Not limited		Not limited	
Armesa	30	Not limited		Not limited		Very limited	
						Carbonate content	1.00
Redona	20	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.01	Too sandy	0.01		
61:							
Berwolf	60	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.70	Too sandy	0.70		
Roswell	20	Very limited		Very limited		Somewhat limited	
		Too sandy	1.00	Too sandy	1.00	Droughty	0.48
						Slope	0.16
AcA:							
Acuff	90	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
AcB:							
Acuff	90	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
AfA:							
Amarillo	85	Not limited		Not limited		Not limited	

Table 8.--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
AfB:							
Amarillo	85	Not limited		Not limited		Not limited	
AnB:							
Amarillo	85	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.70	Too sandy	0.70		
AvA:							
Arvana	85	Not limited		Not limited		Somewhat limited	
						Depth to cemented pan	0.35
BcA:							
Bippus	85	Not limited		Not limited		Not limited	
DRC:							
Drake	90	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
EsA:							
Estacado	90	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
EsB:							
Estacado	85	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
FrA:							
Friona	85	Not limited		Not limited		Somewhat limited	
						Depth to cemented pan	0.46
GoB:							
Gomez	85	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.72	Too sandy	0.72		
GrA:							
Grier	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
						Sodium content	1.00
						Depth to saturated zone	0.05
KmB:							
Kimberson	90	Not limited		Not limited		Very limited	
						Depth to cemented pan	1.00
						Carbonate content	1.00
						Droughty	0.99
						Gravel content	0.62
LcA:							
Lazbuddie	85	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
LoA:							
Lofton	85	Not limited		Not limited		Not limited	

Table 8.--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
McA:							
McLean	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Too clayey	1.00
		Too clayey	0.50	Too clayey	0.50	Ponding	1.00
MsD:							
Milsand	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.79	Too sandy	0.79	Droughty	0.99
MsE:							
Milsand	50	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Droughty	1.00
						Slope	1.00
Arch	40	Not limited		Not limited		Very limited	
						Carbonate content	1.00
NtC:							
Nutivoli	90	Very limited		Very limited		Somewhat limited	
		Too sandy	1.00	Too sandy	1.00	Droughty	0.39
NtD:							
Nutivoli	85	Very limited		Very limited		Somewhat limited	
		Too sandy	1.00	Too sandy	1.00	Droughty	0.59
						Slope	0.16
OcA:							
Olton	95	Not limited		Not limited		Not limited	
OcB:							
Olton	85	Not limited		Not limited		Not limited	
PcA:							
Pep	85	Not limited		Not limited		Not limited	
PcB:							
Pep	85	Not limited		Not limited		Not limited	
PeA:							
Pep	85	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
PeB:							
Pep	90	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
PMG:							
Potter	45	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Carbonate content	1.00
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.32			Droughty	0.45
Mobeetie	35	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.98				
PoA:							
Portales	90	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		

Table 8.--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
PsA:							
Posey	85	Not limited		Not limited		Not limited	
PsB:							
Posey	90	Not limited		Not limited		Not limited	
PsC:							
Posey	90	Not limited		Not limited		Not limited	
RaA:							
Randall	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Depth to saturated zone	1.00
RcA:							
Ranco	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
SaA:							
Slaughter	85	Not limited		Not limited		Very limited	
						Depth to cemented pan	1.00
						Droughty	0.29
SnC:							
Spantara	85	Very limited		Very limited		Not limited	
		Too sandy	1.00	Too sandy	1.00		
SpA:							
Sparenberg	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
SsA:							
Sparks	85	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
W:							
Water	100	Not rated		Not rated		Not rated	

Table 9.--Dwellings and Small Commercial Buildings

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10:							
Regnier	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Rock outcrop	30	Not rated		Not rated		Not rated	
Lacoca	20	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
11:							
Tucumcari	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Hassell	40	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to soft bedrock	0.29		
13:							
Tucumcari	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Redona	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
28:							
Lacoca	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	0.84	Slope	0.84	Slope	1.00
San Jon	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to soft bedrock	0.20		
Rock outcrop	15	Not rated		Not rated		Not rated	
31:							
Chispa	50	Not limited		Not limited		Not limited	
Redona	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 9.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
32:							
Regnier	40	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Slope	0.63	Slope	1.00
		Depth to soft bedrock	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Lacoca	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Rock outcrop	15	Not rated		Not rated		Not rated	
36:							
Alama	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
37:							
Ima	70	Not limited		Not limited		Not limited	
Gallen	20	Not limited		Not limited		Somewhat limited	
						Slope	0.12
58:							
Redona	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Armesa	25	Not limited		Not limited		Not limited	
60:							
Chispa	40	Not limited		Not limited		Not limited	
Armesa	30	Not limited		Not limited		Somewhat limited	
						Slope	0.12
Redona	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
61:							
Berwolf	60	Not limited		Not limited		Not limited	
Roswell	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
AcA:							
Acuff	90	Not limited		Not limited		Not limited	
AcB:							
Acuff	90	Not limited		Not limited		Not limited	
AfA:							
Amarillo	85	Not limited		Not limited		Not limited	
AfB:							
Amarillo	85	Not limited		Not limited		Not limited	

Table 9.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
AnB:							
Amarillo	85	Not limited		Not limited		Not limited	
AvA:							
Arvana	85	Not limited		Somewhat limited		Not limited	
				Depth to thin cemented pan	0.35		
BcA:							
Bippus	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
DRC:							
Drake	90	Not limited		Not limited		Somewhat limited	
						Slope	0.12
EsA:							
Estacado	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
EsB:							
Estacado	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
FrA:							
Friona	85	Not limited		Somewhat limited		Not limited	
				Depth to thin cemented pan	0.46		
GoB:							
Gomez	85	Not limited		Not limited		Not limited	
GrA:							
Grier	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
		Depth to saturated zone	0.10	Shrink-swell	1.00	Depth to saturated zone	0.10
KmB:							
Kimberson	90	Somewhat limited		Very limited		Somewhat limited	
		Depth to thin cemented pan	0.50	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
LcA:							
Lazbuddie	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
LoA:							
Lofton	85	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
McA:							
McLean	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00

Table 9.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MsD:							
Milsand	85	Not limited		Not limited		Somewhat limited	
						Slope	0.12
MsE:							
Milsand	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Arch	40	Not limited		Not limited		Not limited	
NtC:							
Nutivoli	90	Not limited		Not limited		Somewhat limited	
						Slope	0.12
NtD:							
Nutivoli	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
OcA:							
Olton	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
OcB:							
Olton	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PcA:							
Pep	85	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.01			Shrink-swell	0.01
PcB:							
Pep	85	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.01			Shrink-swell	0.01
PeA:							
Pep	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PeB:							
Pep	90	Not limited		Somewhat limited		Not limited	
				Shrink-swell	0.50		
PMG:							
Potter	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.76	Large stones content	0.76	Large stones content	0.76
Mobeetie	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
PoA:							
Portales	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PsA:							
Posey	85	Not limited		Not limited		Not limited	

Table 9.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
PsB:							
Posey	90	Not limited		Not limited		Not limited	
PsC:							
Posey	90	Not limited		Not limited		Somewhat limited	
						Slope	0.50
RaA:							
Randall	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
RcA:							
Ranco	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
SaA:							
Slaughter	85	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
		Depth to thin cemented pan	0.50	Shrink-swell	0.50	Shrink-swell	0.50
SnC:							
Spantara	85	Not limited		Not limited		Not limited	
SpA:							
Sparenberg	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
SsA:							
Sparks	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
W:							
Water	100	Not rated		Not rated		Not rated	

Table 10.--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
10:							
Regnier	35	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Droughty	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Depth to bedrock	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
Lacoca	20	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
				Cutbanks cave	0.10	Depth to bedrock	1.00
11:							
Tucumcari	50	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50	Too clayey	0.01		
Hassell	40	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to soft bedrock	0.29	Depth to bedrock	0.29
		Shrink-swell	1.00	Cutbanks cave	0.10		
				Too clayey	0.03		
13:							
Tucumcari	50	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50	Too clayey	0.01		
Redona	40	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
28:							
Lacoca	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	0.84	Slope	0.84	Depth to bedrock	1.00
				Cutbanks cave	0.10	Slope	0.84
						Large stones content	0.68
San Jon	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.84	Slope	0.84	Slope	0.84
		Low strength	0.78	Depth to soft bedrock	0.20	Depth to bedrock	0.20
		Shrink-swell	0.50	Cutbanks cave	0.10		
Rock outcrop	15	Not rated		Not rated		Not rated	

Table 10.--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
31:							
Chispa	50	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
Redona	40	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
32:							
Regnier	40	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Droughty	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Slope	0.63
Lacoca	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
				Cutbanks cave	0.10	Slope	1.00
Rock outcrop	15	Not rated		Not rated		Not rated	
36:							
Alama	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
37:							
Ima	70	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
Gallen	20	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.85
						Gravel content	0.22
						Large stones content	0.01
58:							
Redona	50	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
Armesa	25	Not limited		Somewhat limited		Very limited	
				Cutbanks cave	0.10	Carbonate content	1.00
60:							
Chispa	40	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
Armesa	30	Not limited		Somewhat limited		Very limited	
				Cutbanks cave	0.10	Carbonate content	1.00
Redona	20	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		

Table 10.--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
61:							
Berwolf	60	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
Roswell	20	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Cutbanks cave	1.00	Droughty	0.48
				Slope	0.16	Slope	0.16
AcA:							
Acuff	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
AcB:							
Acuff	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
AfA:							
Amarillo	85	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
AfB:							
Amarillo	85	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
AnB:							
Amarillo	85	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
AvA:							
Arvana	85	Not limited		Somewhat limited		Somewhat limited	
				Depth to thin cemented pan	0.35	Depth to cemented pan	0.35
				Cutbanks cave	0.10		
BcA:							
Bippus	85	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Flooding	0.40				
DRC:							
Drake	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
EsA:							
Estacado	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
EsB:							
Estacado	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
FrA:							
Friona	85	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to thin cemented pan	0.46	Depth to cemented pan	0.46
				Cutbanks cave	0.10		

Table 10.--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
GoB:							
Gomez	85	Not limited		Very limited		Not limited	
				Cutbanks cave	1.00		
GrA:							
Grier	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Sodium content	1.00
		Low strength	0.22	Cutbanks cave	0.10	Depth to saturated zone	0.05
		Depth to saturated zone	0.05				
KmB:							
Kimberson	90	Somewhat limited		Very limited		Very limited	
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to cemented pan	1.00
				Cutbanks cave	1.00	Carbonate content	1.00
						Droughty	0.99
						Gravel content	0.62
LcA:							
Lazbuddie	85	Very limited		Very limited		Very limited	
		Low strength	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Shrink-swell	1.00	Too clayey	0.50		
LoA:							
Lofton	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	1.00	Cutbanks cave	0.10		
McA:							
McLean	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Ponding	1.00	Too clayey	1.00
		Ponding	1.00	Cutbanks cave	1.00	Ponding	1.00
		Low strength	1.00	Too clayey	0.88		
MsD:							
Milsand	85	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.99
MsE:							
Milsand	50	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Droughty	1.00
				Slope	1.00	Slope	1.00
Arch	40	Not limited		Somewhat limited		Very limited	
				Cutbanks cave	0.10	Carbonate content	1.00
NtC:							
Nutivoli	90	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.39
NtD:							
Nutivoli	85	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Cutbanks cave	1.00	Droughty	0.59
				Slope	0.16	Slope	0.16

Table 10.--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
OcA:							
Olton----------------	95	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
OcB:							
Olton----------------	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50	Too clayey	0.02		
PcA:							
Pep------------------	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.01				
PcB:							
Pep------------------	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.01				
PeA:							
Pep------------------	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
PeB:							
Pep------------------	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
PMG:							
Potter---------------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Carbonate content	1.00
		Large stones content	0.76	Large stones content	0.76	Slope	1.00
				Cutbanks cave	0.10	Droughty	0.45
Mobeetie-------------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10		
PoA:							
Portales-------------	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
PsA:							
Posey----------------	85	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
PsB:							
Posey----------------	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
PsC:							
Posey----------------	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		

Table 10.--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
RaA:							
Randall	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Ponding	1.00	Too clayey	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Too clayey	1.00		
RcA:							
Ranco	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.12		
SaA:							
Slaughter	85	Very limited		Very limited		Very limited	
		Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to cemented pan	1.00
		Low strength	1.00	Cutbanks cave	0.10	Droughty	0.29
		Shrink-swell	0.50				
SnC:							
Spantara	85	Not limited		Very limited		Not limited	
				Cutbanks cave	1.00		
SpA:							
Sparenberg	90	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Low strength	1.00	Too clayey	0.12		
SsA:							
Sparks	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
W:							
Water	100	Not rated		Not rated		Not rated	

Table 11.--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
10:					
Regnier	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
Rock outcrop	30	Not rated		Not rated	
Lacoca	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
11:					
Tucumcari	50	Very limited		Not limited	
		Slow water movement	1.00		
Hassell	40	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	0.08
13:					
Tucumcari	50	Very limited		Not limited	
		Slow water movement	1.00		
Redona	40	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.08
28:					
Lacoca	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.84	Slope	1.00
San Jon	30	Very limited		Very limited	
		Slow water movement	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	0.84	Seepage	0.27
Rock outcrop	15	Not rated		Not rated	

Table 11.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
31:					
Chispa	50	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
Redona	40	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
32:					
Regnier	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	1.00
Lacoca	30	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	
36:					
Alama	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.08
37:					
Ima	70	Not limited		Very limited	
				Seepage	1.00
				Slope	0.32
Gallen	20	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.68
58:					
Redona	50	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.08
Armesa	25	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.08

Table 11.--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
60:					
Chispa	40	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.32
Armesa	30	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Slope	0.68
				Seepage	0.53
Redona	20	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.32
61:					
Berwolf	60	Not limited		Very limited	
				Seepage	1.00
				Slope	0.08
Roswell	20	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Slope	0.16	Slope	1.00
AcA:					
Acuff	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
AcB:					
Acuff	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
AfA:					
Amarillo	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
AfB:					
Amarillo	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.53
AnB:					
Amarillo	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
AvA:					
Arvana	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	0.46	Seepage	0.53

Table 11.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BcA:					
Bippus	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
		Flooding	0.40	Flooding	0.40
DRC:					
Drake	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Slope	0.68
				Seepage	0.50
EsA:					
Estacado	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
EsB:					
Estacado	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
FrA:					
Friona	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Slow water movement	0.46	Seepage	0.53
GoB:					
Gomez	85	Not limited		Very limited	
				Seepage	1.00
GrA:					
Grier	90	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
KmB:					
Kimberson	90	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	0.53
LcA:					
Lazbuddie	85	Very limited		Not limited	
		Slow water movement	1.00		
LoA:					
Lofton	85	Very limited		Not limited	
		Slow water movement	1.00		

Table 11.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
McA:					
McLean	90	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00		
MsD:					
Milsand	85	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.68
MsE:					
Milsand	50	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
Arch	40	Somewhat limited		Very limited	
		Slow water movement	0.46	Seepage	1.00
				Slope	0.08
NtC:					
Nutivoli	90	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.68
NtD:					
Nutivoli	85	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Slope	0.16	Slope	1.00
OcA:					
Olton	95	Very limited		Not limited	
		Slow water movement	1.00		
OcB:					
Olton	85	Very limited		Not limited	
		Slow water movement	1.00		
PcA:					
Pep	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
PcB:					
Pep	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50

Table 11.--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
PeA:					
Pep	85	Very limited		Not limited	
		Slow water movement	1.00		
PeB:					
Pep	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Seepage	0.53
PMG:					
Potter	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.76	Large stones content	0.74
		Slow water movement	0.46	Seepage	0.53
Mobeetie	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
				Seepage	1.00
PoA:					
Portales	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
PsA:					
Posey	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
PsB:					
Posey	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
PsC:					
Posey	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Slope	0.92
				Seepage	0.53
RaA:					
Randall	90	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		

Table 11.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
RcA:					
Ranco	90	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
SaA:					
Slaughter	85	Very limited		Very limited	
		Depth to cemented pan	1.00	Depth to cemented pan	1.00
				Seepage	0.28
SnC:					
Spantara	85	Not limited		Very limited	
				Seepage	1.00
				Slope	0.08
SpA:					
Sparenberg	90	Very limited		Very limited	
		Slow water movement	1.00	Ponding	1.00
		Ponding	1.00		
SsA:					
Sparks	85	Very limited		Not limited	
		Slow water movement	1.00		
W:					
Water	100	Not rated		Not rated	

Table 12.--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		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10:							
Regnier	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
Lacoca	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
11:							
Tucumcari	50	Not limited		Not limited		Not limited	
Hassell	40	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Hard to compact	1.00
						Depth to bedrock	1.00
13:							
Tucumcari	50	Not limited		Not limited		Not limited	
Redona	40	Not limited		Not limited		Not limited	
28:							
Lacoca	35	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.84	Depth to bedrock	1.00
		Slope	0.84			Slope	0.84
						Seepage	0.50
San Jon	30	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.84	Depth to bedrock	1.00
		Slope	0.84			Slope	0.84
Rock outcrop	15	Not rated		Not rated		Not rated	
31:							
Chispa	50	Not limited		Not limited		Not limited	
Redona	40	Not limited		Not limited		Not limited	
32:							
Regnier	40	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.63	Depth to bedrock	1.00
		Slope	0.63			Slope	0.63
Lacoca	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
Rock outcrop	15	Not rated		Not rated		Not rated	

Table 12.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
36:							
Alama	90	Not limited		Not limited		Not limited	
37:							
Ima	70	Not limited		Not limited		Somewhat limited	
						Seepage	0.52
Gallen	20	Not limited		Not limited		Very limited	
						Seepage	1.00
						Gravel content	1.00
58:							
Redona	50	Not limited		Not limited		Not limited	
Armesa	25	Not limited		Not limited		Very limited	
						Carbonate content	1.00
60:							
Chispa	40	Not limited		Not limited		Not limited	
Armesa	30	Not limited		Not limited		Very limited	
						Carbonate content	1.00
Redona	20	Not limited		Not limited		Not limited	
61:							
Berwolf	60	Not limited		Not limited		Somewhat limited	
						Seepage	0.52
Roswell	20	Very limited		Somewhat limited		Very limited	
		Too sandy	1.00	Slope	0.16	Too sandy	1.00
		Slope	0.16			Seepage	1.00
						Slope	0.16
AcA:							
Acuff	90	Not limited		Not limited		Not limited	
AcB:							
Acuff	90	Not limited		Not limited		Not limited	
AfA:							
Amarillo	85	Not limited		Not limited		Not limited	
AfB:							
Amarillo	85	Not limited		Not limited		Not limited	
AnB:							
Amarillo	85	Not limited		Not limited		Not limited	
AvA:							
Arvana	85	Somewhat limited		Very limited		Very limited	
		Depth to thin cemented pan	0.50	Depth to cemented pan	1.00	Depth to cemented pan	1.00

Table 12.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BcA:							
Bippus	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Flooding	0.40	Too clayey	0.50
		Flooding	0.40				
DRC:							
Drake	90	Not limited		Not limited		Not limited	
EsA:							
Estacado	90	Not limited		Not limited		Not limited	
EsB:							
Estacado	85	Not limited		Not limited		Not limited	
FrA:							
Friona	85	Somewhat limited		Very limited		Very limited	
		Depth to thin cemented pan	0.50	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Too clayey	0.50			Too clayey	0.50
GoB:							
Gomez	85	Somewhat limited		Not limited		Somewhat limited	
		Too sandy	0.50			Seepage	0.52
						Too sandy	0.50
GrA:							
Grier	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Excess sodium	1.00			Depth to saturated zone	0.71
		Too clayey	0.50			Too clayey	0.50
KmB:							
Kimberson	90	Somewhat limited		Very limited		Very limited	
		Depth to thin cemented pan	0.50	Depth to cemented pan	1.00	Depth to cemented pan	1.00
						Gravel content	0.09
LcA:							
Lazbuddie	85	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
LoA:							
Lofton	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
McA:							
McLean	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00

Table 12.--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
MsD:							
Milsand	85	Very limited		Not limited		Very limited	
		Too sandy	1.00			Too sandy	1.00
						Seepage	1.00
MsE:							
Milsand	50	Very limited		Very limited		Very limited	
		Too sandy	1.00	Slope	1.00	Too sandy	1.00
		Slope	1.00			Seepage	1.00
						Slope	1.00
Arch	40	Not limited		Not limited		Very limited	
						Carbonate content	1.00
						Seepage	0.52
NtC:							
Nutivoli	90	Very limited		Not limited		Very limited	
		Too sandy	1.00			Too sandy	1.00
						Seepage	1.00
NtD:							
Nutivoli	85	Very limited		Somewhat limited		Very limited	
		Too sandy	1.00	Slope	0.16	Too sandy	1.00
		Slope	0.16			Seepage	1.00
						Slope	0.16
OcA:							
Olton	95	Not limited		Not limited		Not limited	
OcB:							
Olton	85	Not limited		Not limited		Not limited	
PcA:							
Pep	85	Not limited		Not limited		Not limited	
PcB:							
Pep	85	Not limited		Not limited		Not limited	
PeA:							
Pep	85	Not limited		Not limited		Not limited	
PeB:							
Pep	90	Not limited		Not limited		Not limited	
PMG:							
Potter	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Carbonate content	1.00
		Large stones content	0.96			Slope	1.00
						Large stones content	0.96
Mobeetie	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Seepage	0.52

Table 12.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PoA:							
Portales	90	Not limited		Not limited		Not limited	
PsA:							
Posey	85	Not limited		Not limited		Not limited	
PsB:							
Posey	90	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
PsC:							
Posey	90	Not limited		Not limited		Not limited	
RaA:							
Randall	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
RcA:							
Ranco	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
SaA:							
Slaughter	85	Somewhat limited		Very limited		Very limited	
		Depth to thin cemented pan	0.50	Depth to cemented pan	1.00	Depth to cemented pan	1.00
		Too clayey	0.50			Too clayey	0.50
SnC:							
Spantara	85	Not limited		Not limited		Somewhat limited	
						Seepage	0.52
SpA:							
Sparenberg	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
SsA:							
Sparks	85	Not limited		Not limited		Not limited	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 13.--Source of Gravel and Sand

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
10:					
Regnier	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop	30	Not rated		Not rated	
Lacoca	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
11:					
Tucumcari	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hassell	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
13:					
Tucumcari	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Redona	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
28:					
Lacoca	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
San Jon	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop	15	Not rated		Not rated	
31:					
Chispa	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Redona	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02

Table 13.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
32:					
Regnier	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lacoca	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
Rock outcrop	15	Not rated		Not rated	
36:					
Alama	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
37:					
Ima	70	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
Gallen	20	Fair		Fair	
		Bottom layer	0.25	Bottom layer	0.03
		Thickest layer	0.25	Thickest layer	0.03
58:					
Redona	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Armesa	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
60:					
Chispa	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Armesa	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Redona	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
61:					
Berwolf	60	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.03
Roswell	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.13
		Thickest layer	0.00	Thickest layer	0.13

Table 13.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
AcA:					
Acuff	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AcB:					
Acuff	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AfA:					
Amarillo	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AfB:					
Amarillo	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AnB:					
Amarillo	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AvA:					
Arvana	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BcA:					
Bippus	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DRC:					
Drake	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EsA:					
Estacado	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EsB:					
Estacado	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FrA:					
Friona	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GoB:					
Gomez	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.05
		Thickest layer	0.00	Thickest layer	0.06

Table 13.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
GrA:					
Grier	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KmB:					
Kimberson	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LcA:					
Lazbuddie	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LoA:					
Lofton	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
McA:					
McLean	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MsD:					
Milsand	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.14
MsE:					
Milsand	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.28
		Thickest layer	0.00	Thickest layer	0.28
Arch	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NtC:					
Nutivoli	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.14
		Thickest layer	0.00	Thickest layer	0.25
NtD:					
Nutivoli	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.14
		Thickest layer	0.00	Thickest layer	0.25
OcA:					
Olton	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
OcB:					
Olton	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
PcA:					
Pep	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PcB:					
Pep	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PeA:					
Pep	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PeB:					
Pep	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PMG:					
Potter	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mobeetie	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.01
PoA:					
Portales	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PsA:					
Posey	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PsB:					
Posey	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PsC:					
Posey	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RaA:					
Randall	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RcA:					
Ranco	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
SaA:					
Slaughter	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SnC:					
Spantara	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.07
SpA:					
Sparenberg	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SsA:					
Sparks	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
W:					
Water	100	Not rated		Not rated	

Table 14.--Source of Reclamation Material, Roadfill, and Topsoil

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: 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
10:							
Regnier	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Organic matter content low	0.18	Shrink-swell	0.87	Rock fragments	0.88
		Carbonate content	0.92			Carbonate content	0.95
		Water erosion	0.99				
Rock outcrop	30	Not rated		Not rated		Not rated	
Lacoca	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Organic matter content low	0.88			Carbonate content	0.97
		Carbonate content	0.97				
11:							
Tucumcari	50	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too clayey	0.01
		Organic matter content low	0.50	Shrink-swell	0.87		
Hassell	40	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.50	Depth to bedrock	0.00	Depth to bedrock	0.71
		Carbonate content	0.68	Shrink-swell	0.12		
		Depth to bedrock	0.71				
		Water erosion	0.99				
		Droughty	0.99				
13:							
Tucumcari	50	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too clayey	0.01
		Organic matter content low	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
Redona	40	Fair		Fair		Fair	
		Organic matter content low	0.18	Shrink-swell	0.87		
		Carbonate content	0.68				
		Water erosion	0.99				

Table 14.--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
28:							
Lacoca	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Rock fragments	0.12
		Organic matter content low	0.88			Slope	0.16
San Jon	30	Fair		Poor		Fair	
		Organic matter content low	0.18	Depth to bedrock	0.00	Slope	0.16
		Droughty	0.66	Low strength	0.22	Rock fragments	0.72
		Carbonate content	0.68	Shrink-swell	0.87	Depth to bedrock	0.79
		Depth to bedrock	0.79			Carbonate content	0.86
		Water erosion	0.99				
Rock outcrop	15	Not rated		Not rated		Not rated	
31:							
Chispa	50	Fair		Poor		Good	
		Organic matter content low	0.88	Low strength	0.00		
		Carbonate content	0.92				
Redona	40	Fair		Fair		Good	
		Organic matter content low	0.88	Shrink-swell	0.87		
32:							
Regnier	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Shrink-swell	0.87	Slope	0.37
		Organic matter content low	0.88			Rock fragments	0.97
		Carbonate content	0.92				
		Water erosion	0.99				
Lacoca	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.98	Slope	0.00
		Organic matter content low	0.88				
		Carbonate content	0.92				
Rock outcrop	15	Not rated		Not rated		Not rated	
36:							
Alama	90	Fair		Poor		Good	
		Organic matter content low	0.12	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		

Table 14.--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
37:							
Ima	70	Fair		Good		Fair	
		Organic matter content low	0.12			Too sandy	0.99
		Too sandy	0.99				
Gallen	20	Fair		Fair		Poor	
		Organic matter content low	0.08	Cobble content	0.99	Hard to reclaim (rock fragments)	0.00
		Droughty	0.08			Rock fragments	0.00
		Carbonate content	0.92				
58:							
Redona	50	Fair		Fair		Good	
		Organic matter content low	0.88	Shrink-swell	0.87		
Armesa	25	Poor		Good		Poor	
		Carbonate content	0.00			Carbonate content	0.00
		Organic matter content low	0.50				
		Water erosion	0.90				
60:							
Chispa	40	Fair		Good		Fair	
		Organic matter content low	0.12			Carbonate content	0.99
		Carbonate content	0.68				
Armesa	30	Poor		Good		Poor	
		Carbonate content	0.00			Carbonate content	0.00
		Organic matter content low	0.50				
		Water erosion	0.99				
Redona	20	Fair		Fair		Good	
		Organic matter content low	0.88	Shrink-swell	0.87		
61:							
Berwolf	60	Poor		Good		Good	
		Wind erosion	0.00				
		Organic matter content low	0.88				
Roswell	20	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.84
		Organic matter content low	0.05				
		Droughty	0.63				
AcA:							
Acuff	90	Poor		Good		Good	
		Carbonate content	0.00				
		Organic matter content low	0.02				
		Water erosion	0.99				

Table 14.--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
AcB:							
Acuff	90	Poor		Good		Good	
		Carbonate content	0.00				
		Organic matter content low	0.02				
		Water erosion	0.99				
AfA:							
Amarillo	85	Poor		Good		Good	
		Carbonate content	0.00				
		Organic matter content low	0.40				
AfB:							
Amarillo	85	Poor		Good		Good	
		Carbonate content	0.00				
		Organic matter content low	0.18				
AnB:							
Amarillo	85	Poor		Good		Good	
		Wind erosion	0.00				
		Carbonate content	0.00				
		Organic matter content low	0.08				
		Water erosion	0.99				
AvA:							
Arvana	85	Poor		Poor		Fair	
		Carbonate content	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.65
		Organic matter content low	0.02				
		Depth to cemented pan	0.65				
		Droughty	0.70				
		Water erosion	0.99				
BcA:							
Bippus	85	Fair		Fair		Fair	
		Organic matter content low	0.50	Low strength	0.22	Too clayey	0.64
		Too clayey	0.98	Shrink-swell	0.93		
DRC:							
Drake	90	Fair		Good		Fair	
		Organic matter content low	0.18			Sodium content	0.78
		Sodium content	0.78				
		Carbonate content	0.99				
EsA:							
Estacado	90	Fair		Poor		Fair	
		Carbonate content	0.32	Low strength	0.00	Too clayey	0.70
		Organic matter content low	0.88	Shrink-swell	0.96		
		Too clayey	0.98				
		Water erosion	0.99				

Table 14.--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
EsB:							
Estacado------------	85	Fair		Poor		Good	
		Carbonate content	0.08	Low strength	0.00		
		Organic matter content low	0.08	Shrink-swell	0.97		
		Water erosion	0.99				
FrA:							
Friona--------------	85	Fair		Poor		Fair	
		Carbonate content	0.08	Depth to cemented pan	0.00	Depth to cemented pan	0.54
		Organic matter content low	0.50	Low strength	0.00	Too clayey	0.64
		Depth to cemented pan	0.54				
		Droughty	0.94				
		Too clayey	0.98				
		Water erosion	0.99				
GoB:							
Gomez---------------	85	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.50
		Carbonate content	0.00			Carbonate content	0.63
		Organic matter content low	0.18			Rock fragments	0.97
		Too sandy	0.50				
		Water erosion	0.99				
GrA:							
Grier---------------	90	Fair		Poor		Fair	
		Organic matter content low	0.08	Low strength	0.00	Carbonate content	0.47
		Carbonate content	0.32	Shrink-swell	0.35	Salinity	0.50
		Sodium content	0.90	Wetness depth	0.73	Wetness depth	0.73
		Water erosion	0.99			Sodium content	0.90
KmB:							
Kimberson-----------	90	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	0.03
		Carbonate content	0.00			Carbonate content	0.99
		Organic matter content low	0.12				
		Water erosion	0.99				
LcA:							
Lazbuddie-----------	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.88	Shrink-swell	0.12		

Table 14.--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
LoA:							
Lofton	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content low	0.18	Shrink-swell	0.67		
		Carbonate content	0.46				
McA:							
McLean	90	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
				Low strength	0.00		
MsD:							
Milsand	85	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.02
		Too sandy	0.02			Rock fragments	0.76
		Organic matter content low	0.18				
		Droughty	0.28				
MsE:							
Milsand	50	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.00
		Organic matter content low	0.08				
		Droughty	0.10				
Arch	40	Poor		Good		Poor	
		Carbonate content	0.00			Carbonate content	0.00
		Organic matter content low	0.02				
NtC:							
Nutivoli	90	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Organic matter content low	0.18				
NtD:							
Nutivoli	85	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.84
		Organic matter content low	0.02				
OcA:							
Olton	95	Fair		Poor		Fair	
		Organic matter content low	0.02	Low strength	0.00	Too clayey	0.27
		Carbonate content	0.08	Shrink-swell	0.87		
		Too clayey	0.50				

Table 14.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OcB:							
Olton	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Carbonate content	0.08	Shrink-swell	0.87		
		Organic matter content low	0.08				
PcA:							
Pep	85	Fair		Poor		Fair	
		Organic matter content low	0.18	Low strength	0.00	Too clayey	0.61
		Carbonate content	0.68				
		Too clayey	0.98				
PcB:							
Pep	85	Fair		Poor		Fair	
		Organic matter content low	0.18	Low strength	0.00	Too clayey	0.61
		Carbonate content	0.68				
		Too clayey	0.98				
PeA:							
Pep	85	Fair		Poor		Fair	
		Carbonate content	0.16	Low strength	0.00	Too clayey	0.58
		Organic matter content low	0.18	Shrink-swell	0.87		
		Too clayey	0.98				
		Water erosion	0.99				
PeB:							
Pep	90	Fair		Poor		Good	
		Carbonate content	0.16	Low strength	0.00		
		Organic matter content low	0.18	Shrink-swell	0.99		
		Water erosion	0.99				
PMG:							
Potter	45	Poor		Poor		Poor	
		Carbonate content	0.00	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.00	Slope	0.68	Rock fragments	0.00
		Cobble content	0.35	Stone content	0.97	Slope	0.00
		Stone content	0.91			Carbonate content	0.97
		Droughty	0.95				
		Water erosion	0.99				
Mobeetie	35	Fair		Fair		Poor	
		Organic matter content low	0.02	Slope	0.02	Slope	0.00
		Water erosion	0.99				

Table 14.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PoA:							
Portales	90	Fair		Poor		Fair	
		Organic matter content low	0.08	Low strength	0.00	Too clayey	0.64
		Carbonate content	0.46	Shrink-swell	0.92		
		Too clayey	0.98				
		Water erosion	0.99				
PsA:							
Posey	85	Poor		Fair		Fair	
		Carbonate content	0.00	Low strength	0.78	Carbonate content	0.99
		Organic matter content low	0.08				
		Water erosion	0.99				
PsB:							
Posey	90	Poor		Good		Fair	
		Carbonate content	0.00			Carbonate content	0.99
		Organic matter content low	0.08				
		Water erosion	0.99				
PsC:							
Posey	90	Poor		Fair		Good	
		Carbonate content	0.00	Low strength	0.78		
		Organic matter content low	0.08				
		Water erosion	0.99				
RaA:							
Randall	90	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Too clayey	0.00
		Organic matter content low	0.18	Shrink-swell	0.00	Wetness depth	0.00
				Low strength	0.00		
RcA:							
Ranco	90	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Too clayey	0.00
		Organic matter content low	0.18	Shrink-swell	0.00	Wetness depth	0.00
				Low strength	0.00		
SaA:							
Slaughter	85	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	Too clayey	0.07
		Carbonate content	0.08	Shrink-swell	0.87		
		Too clayey	0.12				
		Organic matter content low	0.12				
		Water erosion	0.99				

Table 14.--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
SnC:							
Spantara	85	Poor		Good		Good	
		Wind erosion	0.00				
		Organic matter content low	0.24				
SpA:							
Sparenberg	90	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Organic matter content low	0.60	Low strength	0.00		
SsA:							
Sparks	85	Fair		Poor		Fair	
		Organic matter content low	0.18	Low strength	0.00	Too clayey	0.58
		Too clayey	0.98	Shrink-swell	0.87		
		Water erosion	0.99				
W:							
Water	100	Not rated		Not rated		Not rated	

Table 15.--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
10:							
Regnier	35	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	0.78	Piping	0.61		
Rock outcrop	30	Not rated		Not rated		Not rated	
Lacoca	20	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
11:							
Tucumcari	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.01	Depth to water	1.00
Hassell	40	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.08	Thin layer	0.81	Depth to water	1.00
				Hard to pack	0.53		
13:							
Tucumcari	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.03	Depth to water	1.00
Redona	40	Somewhat limited		Not limited		Very limited	
		Seepage	0.72			Depth to water	1.00
28:							
Lacoca	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	1.00				
San Jon	30	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.95	Depth to water	1.00
		Seepage	0.53	Thin layer	0.77		
		Depth to bedrock	0.06				
Rock outcrop	15	Not rated		Not rated		Not rated	
31:							
Chispa	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.72	Depth to water	1.00
Redona	40	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Seepage	0.02	Depth to water	1.00

Table 15.--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
32:							
Regnier	40	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	0.78	Piping	0.78		
Lacoca	30	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Seepage	0.02		
Rock outcrop	15	Not rated		Not rated		Not rated	
36:							
Alama	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.53	Depth to water	1.00
37:							
Ima	70	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.02	Depth to water	1.00
		Slope	0.08				
Gallen	20	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.25	Depth to water	1.00
		Slope	0.32				
58:							
Redona	50	Somewhat limited		Not limited		Very limited	
		Seepage	0.72			Depth to water	1.00
Armesa	25	Somewhat limited		Not limited		Very limited	
		Seepage	0.72			Depth to water	1.00
60:							
Chispa	40	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.90	Depth to water	1.00
		Slope	0.08				
Armesa	30	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Seepage	0.01	Depth to water	1.00
		Slope	0.32				
Redona	20	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Seepage	0.02	Depth to water	1.00
		Slope	0.08				
61:							
Berwolf	60	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.03	Depth to water	1.00
Roswell	20	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.13	Depth to water	1.00
		Slope	1.00				
AcA:							
Acuff	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	0.99	Depth to water	1.00

Table 15.--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
AcB:							
Acuff	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	0.99	Depth to water	1.00
AfA:							
Amarillo	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.92	Depth to water	1.00
AfB:							
Amarillo	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.97	Depth to water	1.00
AnB:							
Amarillo	85	Somewhat limited		Not limited		Very limited	
		Seepage	0.72			Depth to water	1.00
AvA:							
Arvana	85	Somewhat limited		Very limited		Very limited	
		Depth to cemented pan	0.83	Piping	1.00	Depth to water	1.00
		Seepage	0.72	Thin layer	0.83		
BcA:							
Bippus	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.55	Depth to water	1.00
DRC:							
Drake	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.22	Depth to water	1.00
		Slope	0.32				
EsA:							
Estacado	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.88	Depth to water	1.00
EsB:							
Estacado	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.88	Depth to water	1.00
FrA:							
Friona	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to cemented pan	0.86	Thin layer	0.86	Depth to water	1.00
		Seepage	0.72	Piping	0.72		
GoB:							
Gomez	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.06	Depth to water	1.00
GrA:							
Grier	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Ponding	1.00	Slow refill	0.96
				Piping	1.00	Cutbanks cave	0.10
				Depth to saturated zone	0.96	Salinity and saturated zone	0.06
						Depth to saturated zone	0.02

Table 15.--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
KmB:							
Kimberson	90	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	0.72				
LcA:							
Lazbuddie	85	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.64	Depth to water	1.00
LoA:							
Lofton	85	Not limited		Not limited		Very limited	
						Depth to water	1.00
McA:							
McLean	90	Not limited		Very limited		Very limited	
				Ponding	1.00	Depth to water	1.00
				Hard to pack	1.00		
MsD:							
Milsand	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.14	Depth to water	1.00
		Slope	0.32				
MsE:							
Milsand	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.28	Depth to water	1.00
		Slope	1.00				
Arch	40	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.81	Depth to water	1.00
NtC:							
Nutivoli	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.25	Depth to water	1.00
		Slope	0.32				
NtD:							
Nutivoli	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.25	Depth to water	1.00
		Slope	1.00				
OcA:							
Olton	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.29	Depth to water	1.00
OcB:							
Olton	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.21	Depth to water	1.00
PcA:							
Pep	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.16	Depth to water	1.00
PcB:							
Pep	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.17	Depth to water	1.00

Table 15.--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
PeA:							
Pep	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.62	Depth to water	1.00
PeB:							
Pep	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.86	Depth to water	1.00
PMG:							
Potter	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Large stones content	0.76	Depth to water	1.00
		Seepage	0.72				
Mobeetie	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.01	Depth to water	1.00
		Slope	1.00				
PoA:							
Portales	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.64	Depth to water	1.00
PsA:							
Posey	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.74	Depth to water	1.00
PsB:							
Posey	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.68	Depth to water	1.00
PsC:							
Posey	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.79	Depth to water	1.00
		Slope	0.68				
RaA:							
Randall	90	Not limited		Very limited		Very limited	
				Ponding	1.00	Slow refill	1.00
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Hard to pack	0.95		
RcA:							
Ranco	90	Not limited		Very limited		Very limited	
				Ponding	1.00	Slow refill	1.00
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Hard to pack	0.95		
SaA:							
Slaughter	85	Very limited		Very limited		Very limited	
		Depth to cemented pan	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	0.54	Piping	0.12		
SnC:							
Spantara	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.07	Depth to water	1.00

Table 15.--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
SpA:							
Sparenberg----------	90	Not limited		Very limited		Very limited	
				Ponding	1.00	Depth to water	1.00
				Hard to pack	0.85		
SsA:							
Sparks--------------	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.12	Depth to water	1.00
W:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 16.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
10:												
Regnier----------	0-3	Loam	CL	A-6	0	0	80-100	75-100	60-75	50-60	25-35	10-15
	3-12	Clay loam, sandy clay loam, gravelly sandy clay loam	CL, GC, SC	A-6	0	0-12	65-100	60-100	50-80	40-60	25-40	10-20
	12-60	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Bedrock			---	---	---	---	---	---	---	---
Lacoca-----------	0-8	Loam	SC-SM, SM	A-2-4, A-4	0-2	0-5	90-100	90-98	70-90	30-50	15-25	NP-7
	8-60	Bedrock			---	---	---	---	---	---	---	---
11:												
Tucumcari--------	0-5	Clay loam	CL	A-6	0	0	100	100	85-95	65-85	35-40	15-20
	5-19	Clay loam	CL	A-6, A-7	0	0	100	100	85-100	65-85	38-52	19-29
	19-49	Clay loam	CL	A-6, A-7	0	0	100	100	85-100	65-80	35-45	15-22
	49-60	Clay loam, sandy clay loam, clay	CL	A-6, A-7	0	0	100	100	90-100	60-80	35-50	15-25
Hassell----------	0-4	Clay loam	CH, CL	A-7	0	0	100	100	85-95	70-90	41-53	21-29
	4-22	Silty clay loam, clay, silty clay	CH, CL	A-7	0	0	100	100	90-100	75-95	45-61	25-37
	22-32	Silty clay loam, clay, silty clay	CH, CL	A-7	0	0	100	100	90-100	75-95	45-61	25-37
	32-60	Bedrock			---	---	---	---	---	---	---	---
13:												
Tucumcari--------	0-5	Loam	CL	A-6	0	0	100	100	80-90	60-70	25-35	10-15
	5-19	Clay loam	CL	A-6, A-7	0	0	100	100	85-100	65-85	38-52	19-29
	19-49	Clay loam	CL	A-6, A-7	0	0	100	100	85-100	65-80	35-45	15-22
	49-60	Clay loam, sandy clay loam, clay	CL	A-6, A-7	0	0	100	100	90-100	60-80	35-50	15-25
Redona-----------	0-4	Loam	CL-ML, CL	A-4	0	0	100	100	85-100	60-75	25-30	5-10
	4-23	Sandy clay loam, clay loam, loam	CL, SC	A-6	0	0	100	100	80-100	35-55	29-47	12-25
	23-60	Sandy clay loam, clay loam, loam	CL, SC	A-6	0	0	100	100	80-100	35-55	29-46	12-25

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
28:												
Lacoca----------	0-12	Cobbly fine sandy loam	SC, SC-SM, SM	A-2, A-4	0	15-25	75-95	70-90	60-80	20-40	15-25	NP-10
	12-60	Bedrock			---	---	---	---	---	---	---	---
San Jon---------	0-6	Loam	ML, CL-ML, CL	A-4	0	0	85-100	80-95	75-90	55-70	25-35	5-10
	6-33	Loam, clay loam, silty clay loam	CL	A-6	0	0	80-95	75-90	70-85	55-80	30-40	10-15
	33-60	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Bedrock			---	---	---	---	---	---	---	---
31:												
Chispa----------	0-7	Fine sandy loam	ML, SM	A-4	0	0	90-100	85-100	75-90	36-60	20-35	NP-5
	7-43	Sandy clay loam, clay loam, loam	CL	A-6, A-7	0	0	90-100	85-100	75-90	50-70	30-45	11-25
	43-60	Sandy loam, sandy clay loam, loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	85-100	80-100	50-90	36-60	20-35	4-15
Redona----------	0-8	Fine sandy loam	SM	A-2, A-4	0	0	100	100	80-90	30-50	20-25	NP-5
	8-60	Sandy clay loam, clay loam, loam	CL, SC, SC-SM, CL-ML	A-6, A-4	0	0	100	100	80-100	35-55	25-35	5-15
32:												
Regnier---------	0-8	Loam	CL	A-6	0	0	80-100	75-100	60-75	50-60	25-35	10-15
	8-12	Clay loam, sandy clay loam, gravelly sandy clay loam	CL, GC, SC	A-6	0	0-10	75-100	65-95	50-80	40-60	25-40	10-20
	12-60	Bedrock			---	---	---	---	---	---	---	---
Lacoca----------	0-5	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0-5	90-100	90-98	70-90	25-45	15-25	NP-7
	5-60	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Bedrock			---	---	---	---	---	---	---	---
36:												
Alama-----------	0-3	Silt loam	CL	A-6	0	0	100	100	95-100	70-80	25-35	10-15
	3-28	Silty clay loam, clay loam, silt loam	CL	A-6	0	0	100	100	95-100	75-95	25-40	10-20
	28-60	Silt loam, loam, clay loam	CL	A-6	0	0	100	100	95-100	75-85	25-40	10-20

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
37:												
Ima-------------	0-12	Fine sandy loam	SM	A-2, A-4	0	0	90-100	85-100	75-100	25-50	20-30	NP-5
	12-60	Fine sandy loam, sandy loam	SM	A-2, A-4	0	0	90-100	85-100	75-100	25-50	20-30	NP-5
Gallen----------	0-5	Gravelly sandy loam	SM	A-2	0	0-10	65-85	55-75	35-50	25-35	20-25	NP-5
	5-20	Extremely gravelly loam, very gravelly loam, very gravelly sandy loam	GP-GM, GP, GM	A-1, A-2	0	10-25	20-60	5-50	5-40	0-30	20-25	NP-5
	20-60	Very gravelly sand, very gravelly loamy sand, extremely gravelly sandy loam	GP-GM, GP, SM, SP	A-1	0	10-25	20-60	5-50	5-25	0-15	1-5	NP
58:												
Redona----------	0-6	Sandy clay loam	CL-ML, CL	A-4	0	0	100	100	85-100	60-75	20-25	5-10
	6-60	Sandy clay loam, clay loam, loam	SC-SM, CL-ML, CL, SC	A-4, A-6	0	0	100	100	80-100	35-55	25-35	5-15
Armesa----------	0-2	Sandy clay loam	SC	A-4	0	0	100	95-100	70-85	40-60	25-30	5-10
	2-60	Sandy clay loam, loam, very fine sandy loam	CL-ML, SC-SM, SC	A-4	0	0	100	95-100	70-85	40-60	25-30	5-10
60:												
Chispa----------	0-7	Fine sandy loam	SM, ML	A-4	0	0	90-100	85-100	75-90	36-60	20-35	NP-5
	7-32	Sandy clay loam, clay loam, loam	CL	A-6, A-7	0	0	90-100	85-100	75-90	50-70	30-45	10-25
	32-60	Sandy loam, sandy clay loam, loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	85-100	80-100	50-90	36-60	20-35	5-15
Armesa----------	0-10	Fine sandy loam	SM	A-2, A-4	0	0	100	95-100	70-80	30-40	20-25	NP-5
	10-60	Sandy clay loam, loam, very fine sandy loam	CL-ML, SC-SM, SC	A-4	0	0	100	95-100	65-85	40-60	25-30	5-10
Redona----------	0-6	Fine sandy loam	SM	A-2, A-4	0	0	100	100	80-90	30-50	20-25	NP-5
	6-60	Sandy clay loam, clay loam, loam	SC-SM, CL-ML, CL, SC	A-4, A-6	0	0	100	100	80-100	35-55	25-35	5-15

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
61:												
Berwolf----------	0-11	Loamy fine sand	SM	A-2	0	0	100	100	75-90	20-30	1-5	NP
	11-42	Fine sandy loam, sandy loam	SM	A-2	0	0	100	100	65-80	25-35	20-25	NP-5
	42-60	Fine sandy loam, loamy fine sand	SM	A-2, A-4	0	0	100	100	75-90	20-40	15-25	NP-5
Roswell----------	0-8	Fine sand	SM	A-2	0	0	100	95-100	75-82	15-25	1-5	NP
	8-60	Fine sand, loamy fine sand	SM	A-2	0	0	100	95-100	65-80	20-35	1-5	NP
AcA:												
Acuff------------	0-9	Loam	CL, CL-ML	A-4	0	0	100	100	95-100	51-70	25-30	5-10
	9-16	Sandy clay loam, clay loam	CL	A-6	0	0	100	100	95-100	50-75	30-35	10-15
	16-33	Sandy clay loam, clay loam	CL	A-6	0	0	100	100	95-100	50-75	30-35	10-15
	33-80	Clay loam, loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	60-75	25-35	5-15
AcB:												
Acuff------------	0-7	Loam	CL, CL-ML	A-4	0	0	100	100	95-100	51-70	25-30	5-10
	7-33	Sandy clay loam, clay loam	CL	A-6	0	0	100	100	95-100	50-75	30-35	10-15
	33-80	Clay loam, loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	60-75	25-35	5-15
AfA:												
Amarillo---------	0-9	Fine sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	70-90	30-50	21-31	6-12
	9-42	Sandy clay loam, clay loam	CL, SC	A-6	0	0	100	100	95-100	35-65	25-35	10-20
	42-80	Loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	90-100	65-95	35-70	15-25	5-15
AfB:												
Amarillo---------	0-10	Fine sandy loam	SM	A-2-4, A-4	0	0	100	100	70-90	30-50	20-25	NP-5
	10-35	Sandy clay loam, clay loam	CL, SC	A-6	0	0	100	100	95-100	35-65	25-35	10-20
	35-80	Sandy clay loam, clay loam	SC-SM, SC, CL	A-4, A-6	0	0	90-100	90-100	65-98	36-70	29-44	9-25

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
AnB:												
Amarillo---------	0-7	Loamy fine sand	SM	A-2-4	0	0	100	100	95-100	15-35	15-20	NP-5
	7-37	Sandy clay loam, clay loam	CL, SC	A-6	0	0	100	100	95-100	35-65	25-35	10-20
	37-80	Loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	90-100	65-95	35-70	15-25	5-15
AvA:												
Arvana-----------	0-8	Fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	70-90	30-50	20-30	2-7
	8-17	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-95	35-65	25-40	7-15
	17-31	Sandy clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	80-95	50-75	25-35	5-12
	31-35	Cemented material			---	---	---	---	---	---	---	---
	35-80	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-98	36-65	20-40	5-22
BcA:												
Bippus-----------	0-13	Clay loam	CL	A-6	0	0	100	95-100	85-98	50-80	30-40	10-20
	13-23	Clay loam, loam, sandy clay loam	SC-SM, SC, CL	A-4, A-6	0	0	100	95-100	85-98	36-75	22-40	7-20
	23-80	Clay loam	CL	A-6	0	0	100	90-100	85-98	50-80	30-40	10-20
DRC:												
Drake------------	0-7	Loam	SC, CL	A-6, A-4	0	0	98-100	96-100	85-98	30-75	21-38	5-14
	7-28	Fine sandy loam, sandy clay loam, loam, clay loam	SC, CL	A-4, A-6, A-7	0	0	98-100	96-100	85-98	36-75	25-45	9-21
	28-55	Fine sandy loam, sandy clay loam, loam, clay loam	SC, CL	A-4, A-6, A-7	0	0	98-100	96-100	85-98	36-75	25-45	9-21
	55-80	Fine sandy loam, loam, sandy clay loam, clay loam	SC, CL	A-4, A-6, A-7	0	0	98-100	96-100	85-98	36-75	25-45	9-21
EsA:												
Estacado---------	0-11	Loam	CL	A-6	0	0	98-100	95-100	80-100	65-90	25-35	10-15
	11-20	Clay loam	CL	A-6	0	0	95-100	95-100	80-100	51-80	30-38	10-15
	20-80	Clay loam	CL	A-6	0	0	90-100	90-100	80-100	60-90	30-38	10-15

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EsB:												
Estacado--------	0-13	Loam	CL	A-6	0	0	98-100	95-100	80-100	65-90	25-35	10-15
	13-22	Clay loam	CL	A-6	0	0	95-100	95-100	80-100	51-80	30-38	10-15
	22-30	Clay loam	CL	A-6	0	0	95-100	95-100	80-100	60-90	30-38	10-15
	30-80	Clay loam	CL	A-6	0	0	90-100	90-100	80-100	60-90	30-38	10-15
FrA:												
Friona----------	0-6	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	55-70	24-35	5-12
	6-24	Clay loam	CL	A-6, A-7-6	0	0	100	95-100	75-95	60-75	30-45	10-20
	24-30	Clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	100	90-100	90-100	60-75	30-45	10-20
	30-41	Cemented material			---	---	---	---	---	---	---	---
	41-80	Sandy clay loam, clay loam, loam	CL	A-6, A-7-6	0	0	85-100	75-100	65-90	55-75	30-45	12-25
GoB:												
Gomez-----------	0-12	Loamy fine sand	SM	A-2-4	0	0	95-100	95-100	80-95	15-35	16-26	1-7
	12-20	Fine sandy loam	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	75-95	55-75	20-35	6-16
	20-23	Fine sandy loam, loam	CL-ML, SC, SC-SM, CL	A-4	0	0	95-100	95-100	75-95	35-70	20-32	6-13
	23-47	Fine sandy loam, loamy fine sand	CL-ML, CL	A-4	0	0	90-100	80-95	75-95	50-65	16-32	2-13
	47-80	Loamy fine sand	SM	A-2-4	0	0	95-100	95-100	80-95	15-35	15-24	1-7
GrA:												
Grier-----------	0-4	Clay loam	CL	A-6, A-7	0	0	100	100	85-100	70-90	30-45	15-25
	4-18	Clay loam	CL	A-6	0	0	100	100	90-100	70-90	30-40	15-25
	18-35	Sandy clay loam	CL	A-4, A-6	0	0	100	100	80-95	50-75	25-35	10-20
	35-80	Clay loam	CL	A-6	0	0	100	100	75-100	70-90	30-40	15-25
KmB:												
Kimberson-------	0-5	Gravelly loam	CL-ML, CL, GC, GC-GM	A-4, A-2-4	0	0-5	70-90	50-70	35-60	30-55	25-35	5-10
	5-14	Gravelly loam	CL-ML, GC-GM, SC-SM, SC	A-2-4, A-4	0	0-15	65-90	60-85	40-60	30-55	25-30	5-10
	14-20	Cemented material			---	---	---	---	---	---	---	---
	20-80	Gravelly loam	CL-ML, GC-GM, SC-SM, SC	A-2-4, A-4	0-5	0-15	65-90	60-85	40-60	30-55	25-30	5-10
LcA:												
Lazbuddie-------	0-10	Clay	CH, CL	A-7-6	0	0	100	100	90-100	70-100	40-70	18-45
	10-45	Clay	CH, CL	A-7-6	0	0	100	100	90-100	70-100	40-70	18-45
	45-80	Clay	CH, CL	A-7-6	0	0	100	100	90-100	70-100	40-70	18-45

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LoA:												
Lofton----------	0-6	Clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	65-85	35-45	15-25
	6-25	Silty clay	CH, CL	A-7-6	0	0	100	100	85-100	80-95	40-55	20-30
	25-80	Clay loam	CL	A-6	0	0	100	95-100	80-100	60-80	30-40	15-25
McA:												
McLean----------	0-6	Clay	CH	A-7-6	0	0	100	100	95-100	85-98	60-76	40-50
	6-41	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	85-98	60-76	40-50
	41-61	Clay, silty clay	CH	A-7-6	0	0	100	98-100	90-100	80-95	60-76	40-50
	61-80	Clay, silty clay	CH	A-7-6	0	0	100	98-100	90-100	80-95	60-76	40-50
MsD:												
Milsand---------	0-6	Loamy fine sand, loamy sand, fine sand	SP-SM, SM, SC-SM	A-2-4	0	0-2	90-100	90-100	75-95	10-30	16-28	2-9
	6-30	Loamy fine sand, loamy sand, fine sand	SP-SM, SM, SC-SM	A-2-4	0	0-2	90-100	75-90	60-85	10-30	16-27	2-9
	30-80	Fine sand, loamy fine sand, loamy sand	SP-SM, SM, SC-SM	A-2-4	0	0-2	90-100	75-90	60-85	10-30	0-24	NP-7
MsE:												
Milsand---------	0-8	Fine sand	SC-SM, SM, SP-SM	A-2-4	0	0	100	100	75-95	10-30	0-10	NP-5
	8-30	Fine sand	SC-SM, SM	A-2-4	0	0	100	100	75-95	10-30	0-10	NP-5
	30-37	Fine sand	SM, SC-SM	A-2-4	0	0	100	100	75-95	10-30	0-10	NP-5
	37-80	Fine sand	SC-SM, SM, SP-SM	A-2-4	0	0	100	100	75-95	10-30	0-10	NP-5
Arch------------	0-6	Fine sandy loam	SM, SC-SM	A-4	0	0	100	100	70-90	30-50	20-25	NP-5
	6-16	Sandy clay loam	CL-ML, CL	A-4	0	0	100	95-100	90-100	55-75	25-30	5-10
	16-37	Sandy clay loam	SC, CL	A-6	0	0	100	100	70-90	35-65	25-35	10-20
	37-80	Sandy clay loam	CL	A-6	0	0	95-100	90-100	90-100	50-65	25-35	10-20
NtC:												
Nutivoli--------	0-6	Fine sand	SM	A-2-4	0	0	100	100	75-85	15-30	0-5	NP
	6-80	Fine sand	SM	A-2-4	0	0	100	100	75-85	20-35	0-5	NP
NtD:												
Nutivoli--------	0-28	Fine sand	SM	A-2-4	0	0	100	100	75-85	15-30	0-5	NP
	28-80	Fine sand	SM	A-2-4	0	0	100	100	75-85	20-35	0-5	NP

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
OcA:												
Olton-----------	0-6	Clay loam	CL	A-6	0	0	100	100	85-100	55-85	25-35	10-15
	6-17	Clay loam, clay	CL	A-6	0	0	100	95-100	90-100	70-95	35-45	20-30
	17-41	Clay loam	CL	A-6	0	0	100	100	80-100	60-90	35-45	10-20
	41-80	Clay loam	CL	A-6	0	0	100	95-100	80-100	60-90	30-40	10-20
OcB:												
Olton-----------	0-9	Clay loam	CL	A-6	0	0	100	100	85-100	55-85	25-35	10-15
	9-25	Clay, clay loam	CL	A-6	0	0	100	95-100	90-100	65-90	35-45	20-30
	25-34	Clay loam	CL	A-6	0	0	100	100	80-100	60-90	35-45	10-20
	34-80	Clay loam	CL	A-6	0	0	100	95-100	80-100	60-90	30-40	10-20
PcA:												
Pep-------------	0-10	Clay loam	CL	A-6	0	0	100	95-100	90-100	70-80	37-48	16-25
	10-16	Clay loam, loam, sandy clay loam	CL	A-6	0	0	100	95-100	90-100	60-80	26-48	8-25
	16-32	Clay loam, sandy clay loam, loam	CL	A-6	0	0	100	95-100	90-100	60-80	26-48	8-25
	32-80	Clay loam, sandy clay loam, loam	CL	A-4, A-6	0	0	100	95-100	90-100	60-70	26-48	8-25
PcB:												
Pep-------------	0-9	Clay loam	CL	A-6	0	0	100	95-100	90-100	70-80	37-48	16-25
	9-15	Clay loam, loam, sandy clay loam	CL	A-6	0	0	100	95-100	90-100	60-80	26-48	8-25
	15-31	Clay loam, sandy clay loam, loam	CL	A-6	0	0	100	95-100	90-100	60-80	26-48	8-25
	31-80	Clay loam, sandy clay loam, loam	CL	A-4, A-6	0	0	100	95-100	90-100	60-70	26-48	8-25
PeA:												
Pep-------------	0-7	Loam	CL-ML, CL	A-4	0	0	100	95-100	90-100	55-75	25-30	5-10
	7-20	Clay loam	CL	A-6	0	0	100	95-100	85-100	65-85	30-40	10-20
	20-80	Clay loam	CL	A-6	0	0	100	95-100	85-100	65-85	30-40	10-20
PeB:												
Pep-------------	0-14	Loam	CL-ML, CL	A-4	0	0	100	95-100	90-100	55-75	25-30	5-10
	14-30	Loam, clay loam	CL	A-6, A-4	0	0	100	95-100	85-100	65-85	25-30	8-15
	30-80	Clay loam	CL	A-6	0	0	100	95-100	85-100	65-85	30-40	10-20

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
PMG:												
Potter----------	0-4	Loam	CL-ML, CL	A-4	0	0-2	95-100	90-95	65-90	50-65	20-30	5-10
	4-9	Gravelly loam	CL-ML, SC-SM, CL, SC	A-4, A-6	0	0-5	75-90	70-85	40-65	40-60	20-30	5-15
	9-80	Extremely cobbly loam	GC-GM, GC	A-2-4, A-4	5-10	40-50	50-60	45-55	35-45	30-40	20-30	5-10
Mobeetie--------	0-12	Fine sandy loam	CL-ML, CL	A-4	0	0-5	95-100	90-100	75-95	50-70	21-33	6-13
	12-16	Fine sandy loam, sandy loam	SC-SM, CL-ML, SC, CL	A-2-4, A-4	0	0-5	95-100	90-100	70-90	25-55	20-27	5-10
	16-80	Fine sandy loam, sandy loam	CL-ML, SC-SM, SC, CL	A-2-4, A-4	0	0-5	90-100	85-100	70-90	25-55	20-27	5-10
PoA:												
Portales--------	0-15	Loam	CL-ML, CL	A-4	0	0	100	95-100	90-100	60-70	25-30	5-10
	15-35	Clay loam	CL	A-6	0	0	100	95-100	90-100	70-80	35-40	15-20
	35-80	Loam, clay loam	CL	A-6	0	0	100	95-100	90-100	60-80	30-40	10-20
PsA:												
Posey-----------	0-11	Fine sandy loam	CL-ML, SC-SM, SC, CL	A-2-4, A-4	0	0	98-100	95-100	65-85	30-55	17-25	5-10
	11-17	Sandy clay loam, clay loam	CL, CL-ML	A-4, A-6	0	0	98-100	98-100	90-100	55-75	25-35	5-15
	17-42	Sandy clay loam, loam, clay loam	CL, SC	A-6	0	0	95-100	90-100	75-90	40-65	25-40	10-20
	42-80	Sandy clay loam, clay loam	CL	A-6	0	0	90-100	85-100	85-100	50-70	25-40	10-20
PsB:												
Posey-----------	0-6	Fine sandy loam	CL-ML, SC-SM, CL, SC	A-2-4, A-4	0	0	98-100	95-100	65-85	30-55	17-25	5-10
	6-13	Sandy clay loam, clay loam	CL, CL-ML	A-4, A-6	0	0	98-100	98-100	90-100	55-75	25-35	5-15
	13-52	Sandy clay loam, loam, clay loam	CL, SC	A-6	0	0	95-100	90-100	75-90	40-65	25-40	10-20
	52-80	Sandy clay loam, clay loam	CL	A-6	0	0	90-100	85-100	85-100	50-70	25-40	10-20

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
PsC:												
Posey-----------	0-12	Fine sandy loam	CL-ML, SC-SM, CL, SC	A-2-4, A-4	0	0	98-100	95-100	65-85	30-55	17-25	5-10
	12-22	Sandy clay loam, clay loam	CL, CL-ML	A-4, A-6	0	0	98-100	98-100	90-100	55-75	25-35	5-15
	22-38	Sandy clay loam, loam, clay loam	CL, SC	A-6	0	0	95-100	90-100	75-90	40-65	25-40	10-20
	38-80	Sandy clay loam, clay loam	CL	A-6	0	0	90-100	85-100	85-100	50-70	25-40	10-20
RaA:												
Randall---------	0-17	Clay	CH	A-7-6	0	0	95-100	95-100	95-100	75-98	56-66	33-41
	17-28	Clay	CH	A-7-6	0	0	95-100	95-100	95-100	75-98	56-66	33-41
	28-80	Clay	CH	A-7-6	0	0	95-100	95-100	90-100	70-95	56-66	33-41
RcA:												
Ranco-----------	0-5	Clay	CH	A-7-6	0	0	100	100	95-100	75-98	56-66	33-41
	5-12	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	75-98	56-66	33-41
	12-80	Clay, silty clay	CH	A-7-6	0	0	100	98-100	90-100	70-95	56-66	33-41
SaA:												
Slaughter-------	0-6	Loam	CL	A-6	0	0	100	100	85-95	60-80	28-35	10-15
	6-18	Clay loam	CL	A-6, A-7-6	0	0	100	95-100	95-100	65-90	35-45	15-25
	18-30	Cemented material		A-1-a	---	---	---	---	---	---	---	---
	30-80	Sandy clay loam	CL	A-6	0	0	95-100	90-100	60-90	50-75	30-38	10-15
SnC:												
Spantara--------	0-10	Fine sand	SM, SP-SM	A-2-4	0	0	100	95-100	70-95	10-25	15-25	NP-5
	10-45	Fine sandy loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	95-100	70-98	25-55	20-30	5-10
	45-80	Fine sandy loam, sandy loam, loamy fine sand	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	95-100	70-98	25-55	20-30	5-10
SpA:												
Sparenberg------	0-4	Clay	CH, CL	A-7-6	0	0	100	100	95-100	75-98	46-66	28-41
	4-12	Clay, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	75-98	46-66	28-41
	12-46	Clay, silty clay	CH, CL	A-7-6	0	0	100	98-100	90-100	75-95	46-66	28-41
	46-80	Clay, silty clay	CH, CL	A-7-6	0	0	100	98-100	90-100	70-95	46-66	28-41

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SsA:												
Sparks	0-6	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	6-18	Clay, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-90	40-55	15-25
	18-80	Clay loam	CL	A-6	0	0	100	95-100	90-95	60-75	35-40	15-20
W:												
Water	---	---	---	---	---	---	---	---	---	---	---	---

Table 17.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Particle size: Clay	Moist bulk density	Permeability (K-sat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors: Kw	Kf	T	Wind erodibility: group	index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
10:												
Regnier	0-3	18-27	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.37	.43	2	4L	86
	3-12	18-35	1.45-1.55	0.2-0.6	0.14-0.16	3.0-5.9	0.1-0.5	.32	.32			
	12-60	---	---	---	---	---	---	---	---			
Rock outcrop	0-60	---	---	---	---	---	---	---	---	--	---	---
Lacoca	0-8	5-18	1.30-1.50	0.6-2	0.10-0.15	0.0-2.9	0.5-1.0	.24	.28	1	4L	86
	8-60	---	---	0.00-0.2	---	---	---	---	---			
11:												
Tucumcari	0-5	27-35	1.30-1.40	0.2-0.6	0.19-0.21	3.0-5.9	1.0-2.0	.32	.32	5	4L	86
	5-19	28-40	1.40-1.50	0.2-0.6	0.19-0.22	3.0-5.9	0.5-1.2	.32	.32			
	19-49	35-45	1.45-1.55	0.2-0.6	0.19-0.22	3.0-5.9	0.1-0.8	.32	.32			
	49-60	30-45	1.45-1.55	0.2-0.6	0.19-0.21	3.0-5.9	0.1-0.8	.32	.32			
Hassell	0-4	30-40	1.20-1.30	0.2-0.6	0.19-0.21	3.0-5.9	1.0-2.0	.32	.32	3	4	86
	4-22	35-50	1.40-1.50	0.06-0.2	0.16-0.20	6.0-8.9	0.1-0.7	.37	.37			
	22-32	35-50	1.40-1.50	0.06-0.2	0.16-0.20	6.0-8.9	0.0-0.5	.37	.37			
	32-60	---	---	---	---	---	---	---	---			
13:												
Tucumcari	0-5	18-27	1.30-1.40	0.6-2	0.16-0.19	0.0-2.9	1.0-2.0	.37	.37	5	4L	86
	5-19	28-40	1.40-1.50	0.2-0.6	0.19-0.22	3.0-5.9	0.5-1.2	.32	.32			
	19-49	35-45	1.45-1.55	0.2-0.6	0.19-0.22	3.0-5.9	0.1-0.8	.32	.32			
	49-60	30-45	1.45-1.55	0.2-0.6	0.19-0.21	3.0-5.9	0.1-0.8	.32	.32			
Redona	0-4	10-25	1.30-1.40	0.6-2	0.15-0.17	0.0-2.9	1.0-2.0	.37	.37	5	5	56
	4-23	18-35	1.35-1.45	0.6-2	0.17-0.19	3.0-5.9	0.1-1.0	.32	.32			
	23-60	18-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.6	.37	.37			
28:												
Lacoca	0-12	5-18	1.40-1.55	0.6-2	0.10-0.12	0.0-2.9	0.5-0.9	.15	.28	1	5	56
	12-60	---	---	---	---	---	---	---	---			
San Jon	0-4	18-27	1.40-1.50	0.6-2	0.14-0.16	0.0-2.9	0.5-0.9	.37	.37	3	4L	86
	6-35	24-35	1.40-1.50	0.2-0.6	0.13-0.15	3.0-5.9	0.1-0.5	.37	.37			
	35-60	---	---	---	---	---	---	---	---			
Rock outcrop	0-60	---	---	0.00-0.2	---	---	---	---	---	--	---	---

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Particle size: Clay	Moist bulk density	Permeability (K-sat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors: Kw	Kf	T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
31:												
Chispa	0-7	15-20	1.35-1.55	2-6	0.10-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	7-43	25-35	1.35-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.32			
	43-60	15-35	1.35-1.50	0.6-2	0.08-0.15	0.0-2.9	0.1-0.4	.32	.37			
Redona	0-8	10-15	1.35-1.45	2-6	0.12-0.14	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	8-60	20-35	1.40-1.50	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.32	.32			
32:												
Regnier	0-8	18-27	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.37	.43	2	4L	86
	8-12	18-35	1.45-1.55	0.2-0.6	0.14-0.16	3.0-5.9	0.1-0.5	.32	.32			
	12-60	---	---	---	---	---	---	---	---			
Lacoca	0-5	5-18	1.35-1.55	0.6-2	0.10-0.15	0.0-2.9	0.5-1.0	.20	.20	1	3	86
	5-60	---	---	---	---	---	---	---	---			
Rock outcrop	0-60	---	---	---	---	---	---	---	---	--	---	---
36:												
Alama	0-3	18-27	1.20-1.30	0.6-2	0.17-0.20	0.0-2.9	1.0-2.0	.43	.43	5	4L	86
	3-28	18-35	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	28-60	18-35	1.40-1.50	0.2-0.6	0.17-0.20	3.0-5.9	0.1-0.5	.37	.37			
37:												
Ima	0-10	5-18	1.35-1.45	2-6	0.11-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	10-60	8-18	1.45-1.55	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.32			
Gallen	0-5	10-18	1.35-1.45	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.15	.28	2	4	86
	5-20	10-18	1.40-1.50	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.10	.37			
	20-60	1-5	1.40-1.50	6-20	0.04-0.06	0.0-2.9	0.1-0.5	.05	.17			
58:												
Redona	0-6	20-25	1.30-1.40	0.6-2	0.15-0.17	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	6-60	20-35	1.40-1.50	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.32	.32			
Armesa	0-2	20-30	1.30-1.40	0.6-2	0.14-0.16	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	2-60	15-25	1.45-1.55	0.6-2	0.14-0.16	0.0-2.9	0.1-1.0	.43	.43			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Particle size: Clay	Moist bulk density	Permea- bility (K-sat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors: Kw	Erosion factors: Kf	Erosion factors: T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
60:												
Chispa--------------	0-7	15-20	1.35-1.55	2-6	0.10-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	7-32	25-35	1.35-1.50	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.32	.37			
	32-60	15-35	1.35-1.50	0.6-2	0.08-0.15	0.0-2.9	0.1-0.5	.32	.37			
Armesa--------------	0-10	10-20	1.35-1.45	2-6	0.13-0.16	0.0-2.9	1.0-3.0	.28	.28	5	3	86
	10-60	15-25	1.45-1.55	0.6-2	0.14-0.16	0.0-2.9	0.1-1.0	.37	.37			
Redona--------------	0-6	10-15	1.35-1.45	2-6	0.12-0.14	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	6-60	20-35	1.40-1.50	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.32	.32			
61:												
Berwolf-------------	0-11	5-12	1.30-1.40	2-6	0.09-0.10	0.0-2.9	0.9-2.0	.20	.20	5	2	134
	11-42	10-18	1.45-1.55	2-6	0.12-0.14	0.0-2.9	0.5-1.0	.28	.28			
	42-60	7-15	1.45-1.55	2-6	0.13-0.15	0.0-2.9	0.1-0.5	.28	.28			
Roswell-------------	0-8	4-8	1.40-1.50	6-20	0.05-0.07	0.0-2.9	0.5-1.0	.17	.17	5	1	220
	8-60	4-10	1.40-1.50	6-20	0.06-0.09	0.0-2.9	0.1-0.3	.20	.20			
AcA:												
Acuff---------------	0-7	15-25	1.30-1.55	0.6-2	0.14-0.16	0.0-2.9	1.0-2.0	.37	.37	5	6	48
	7-33	25-35	1.40-1.65	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.32	.32			
	33-57	25-35	1.40-1.65	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.32	.32			
	57-80	20-35	1.40-1.65	0.6-2	0.16-0.18	0.0-2.9	0.0-0.2	.32	.32			
AcB:												
Acuff---------------	0-7	15-25	1.30-1.55	0.6-2	0.14-0.16	0.0-2.9	1.0-2.0	.37	.37	5	6	48
	7-33	25-35	1.40-1.65	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.32	.32			
	33-80	20-35	1.40-1.65	0.6-2	0.16-0.18	0.0-2.9	0.0-0.2	.32	.32			
AfA:												
Amarillo------------	0-9	10-18	1.35-1.55	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	9-42	20-35	1.30-1.60	0.6-2	0.16-0.18	0.0-2.9	0.2-0.7	.32	.32			
	42-80	15-32	1.35-1.55	0.6-2	0.13-0.15	0.0-2.9	0.1-0.3	.37	.37			
AfB:												
Amarillo------------	0-10	10-18	1.35-1.55	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	10-35	20-35	1.30-1.60	0.6-2	0.16-0.18	0.0-2.9	0.2-0.7	.32	.32			
	35-80	20-35	1.40-1.65	0.6-2	0.10-0.16	0.0-2.9	0.1-0.5	.32	.32			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Particle size: Clay	Moist bulk density	Permea-bility (K-sat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors: Kw	Kf	T	Wind erodibility: group	index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
AnB:												
Amarillo------------	0-12	5-12	1.40-1.60	2-6	0.08-0.10	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	12-34	20-35	1.30-1.60	0.6-2	0.16-0.18	0.0-2.9	0.2-0.7	.32	.32			
	34-80	20-35	1.35-1.55	0.6-2	0.13-0.15	0.0-2.9	0.1-0.3	.37	.37			
AvA:												
Arvana--------------	0-11	10-20	1.40-1.60	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.37	.37	2	3	86
	11-21	18-35	1.45-1.65	0.6-2	0.16-0.18	0.0-2.9	0.0-0.2	.32	.32			
	21-31	15-27	1.45-1.65	0.6-2	0.14-0.16	0.0-2.9	0.0-0.2	.37	.37			
	31-45	---	---	---	---	---	---	---	---			
	45-80	18-35	1.50-1.70	0.6-2	0.12-0.16	0.0-2.9	0.0-0.0	.24	.32			
BcA:												
Bippus--------------	0-13	27-35	1.30-1.60	0.6-2	0.18-0.20	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	13-23	20-35	1.40-1.65	0.6-2	0.12-0.20	1.5-4.0	0.1-1.0	.32	.32			
	23-80	27-35	1.30-1.60	0.6-2	0.18-0.20	3.0-5.9	0.1-2.0	.32	.32			
DRC:												
Drake---------------	0-5	10-27	1.30-1.55	0.6-2	0.07-0.16	0.0-2.9	0.5-1.5	.28	.28	4	4L	86
	5-14	10-27	1.60-1.65	0.6-2	0.10-0.16	1.0-3.0	0.1-0.5	.32	.32			
	14-34	25-45	1.60-1.65	0.6-2	0.10-0.16	1.0-3.0	0.1-0.5	.32	.32			
	34-80	10-40	1.60-1.65	0.6-2	0.10-0.16	1.0-3.0	0.1-0.5	.32	.32			
EsA:												
Estacado------------	0-11	18-27	1.30-1.45	0.6-2	0.14-0.16	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	11-20	27-35	1.35-1.50	0.6-2	0.18-0.20	0.0-2.9	1.0-3.0	.32	.32			
	20-80	27-35	1.35-1.60	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
EsB:												
Estacado------------	0-10	18-27	1.30-1.45	0.6-2	0.14-0.16	0.0-2.9	1.0-3.0	.37	.37	5	4L	86
	10-22	27-35	1.35-1.50	0.6-2	0.18-0.20	0.0-2.9	0.5-1.0	.32	.32			
	22-32	27-35	1.35-1.55	0.6-2	0.18-0.20	3.0-5.9	0.1-0.5	.32	.32			
	32-80	27-35	1.35-1.60	0.6-2	0.18-0.20	3.0-5.9	0.1-0.3	.32	.32			
FrA:												
Friona--------------	0-8	15-28	1.25-1.50	0.6-2	0.14-0.16	0.0-2.9	1.0-3.0	.37	.37	3	5	56
	8-17	27-35	1.40-1.60	0.6-2	0.18-0.20	0.0-2.9	0.2-1.0	.32	.32			
	17-31	20-35	1.40-1.60	0.6-2	0.17-0.19	0.0-2.9	0.1-0.5	.32	.32			
	31-35	---	---	---	---	---	---	---	---			
	35-80	20-35	1.50-1.70	0.6-2	0.07-0.15	0.0-2.9	0.0-0.5	.32	.32			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Particle size: Clay	Moist bulk density	Permea-bility (K-sat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors: Kw	Kf	T	Wind erodibility: group	index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
GoB:												
Gomez	0-12	4-12	1.30-1.50	2-6	0.08-0.10	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	12-20	10-24	1.45-1.65	2-6	0.14-0.16	0.0-2.9	0.1-0.5	.37	.37			
	20-23	10-20	1.35-1.55	2-6	0.13-0.16	0.0-2.9	0.1-0.5	.28	.28			
	23-47	5-20	1.45-1.65	2-6	0.08-0.15	0.0-2.9	0.1-0.5	.24	.24			
	47-80	4-12	1.30-1.50	2-6	0.08-0.10	0.0-2.9	0.0-0.2	.20	.20			
GrA:												
Grier	0-4	30-40	1.00-1.20	0.06-0.2	0.18-0.20	3.0-5.9	1.0-8.0	.32	.32	5	4L	86
	4-18	30-40	1.25-1.40	0.06-0.2	0.18-0.20	6.0-8.9	1.0-3.0	.32	.32			
	18-35	15-27	1.45-1.65	0.2-0.6	0.14-0.16	3.0-5.9	0.2-1.0	.37	.37			
	35-80	30-40	1.30-1.55	0.06-0.2	0.18-0.20	6.0-8.9	0.1-0.5	.32	.32			
KmB:												
Kimberson	0-5	15-20	1.35-1.45	0.6-2	0.14-0.16	0.0-2.9	1.0-2.0	.37	.37	1	4L	86
	5-14	15-25	1.40-1.50	0.6-2	0.13-0.15	0.0-2.9	0.0-0.5	.20	.20			
	14-20	---	---	---	---	---	---	---	---			
	20-80	15-25	1.40-1.50	0.6-2	0.13-0.15	0.0-2.9	0.0-0.2	.20	.20			
LcA:												
Lazbuddie	0-10	40-60	1.15-1.35	0.06-0.2	0.14-0.15	6.0-8.9	0.5-2.0	.20	.20	5	4	86
	10-45	40-60	1.25-1.40	0.06-0.2	0.14-0.15	6.0-8.9	0.5-1.0	.20	.20			
	45-80	40-60	1.25-1.40	0.06-0.2	0.14-0.15	6.0-8.9	0.1-0.5	.20	.20			
LoA:												
Lofton	0-6	28-40	1.20-1.40	0.2-0.6	0.18-0.20	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	6-25	40-55	1.25-1.45	0.06-0.2	0.14-0.16	6.0-8.9	0.5-2.0	.24	.24			
	25-80	32-40	1.30-1.50	0.06-0.2	0.18-0.20	3.0-5.9	0.1-0.5	.32	.32			
McA:												
McLean	0-6	50-60	1.20-1.40	0.00-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.20	.20	5	7	38
	6-41	50-60	1.25-1.40	0.00-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.20	.20			
	41-62	50-60	1.30-1.45	0.00-0.06	0.11-0.15	9.0-25.0	0.1-0.5	.20	.20			
	62-80	50-60	1.30-1.45	0.00-0.06	0.11-0.15	9.0-25.0	0.1-0.5	.20	.20			
MsD:												
Milsand	0-6	5-15	1.50-1.65	6-20	0.04-0.08	0.0-2.9	0.1-1.0	.15	.15	5	2	134
	6-30	5-15	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			
	30-80	2-12	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.5	.15	.15			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Particle size: Clay	Moist bulk density	Permea-bility (K-sat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors: Kw	Kf	T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
MsE:												
Milsand	0-8	2-6	1.50-1.65	6-20	0.02-0.06	0.0-2.9	0.1-0.3	.10	.10	5	1	220
	8-30	2-6	1.50-1.65	6-20	0.02-0.06	0.0-2.9	0.1-0.3	.10	.10			
	30-37	2-6	1.55-1.75	6-20	0.02-0.06	0.0-2.9	0.1-0.3	.10	.10			
	37-80	2-6	1.50-1.70	6-20	0.02-0.08	0.0-2.9	0.1-0.3	.10	.10			
Arch	0-6	10-18	1.35-1.55	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.28	.28	2	3	86
	6-16	15-25	1.35-1.50	0.6-2	0.14-0.16	0.0-2.9	0.4-0.8	.32	.32			
	16-37	20-35	1.30-1.60	0.6-2	0.16-0.18	0.0-2.9	0.1-0.3	.32	.32			
	37-80	20-35	1.45-1.65	2-6	0.08-0.15	0.0-2.9	0.1-0.2	.32	.32			
NtC:												
Nutivoli	0-6	3-7	1.30-1.40	6-20	0.06-0.08	0.0-2.9	0.4-1.0	.10	.10	5	1	220
	6-80	3-8	1.30-1.45	6-20	0.06-0.10	0.0-2.9	0.1-0.5	.10	.10			
NtD:												
Nutivoli	0-37	3-7	1.30-1.40	6-20	0.06-0.08	0.0-2.9	0.4-1.0	.10	.10	5	1	220
	37-80	3-8	1.30-1.45	6-20	0.06-0.10	0.0-2.9	0.0-0.5	.10	.10			
OcA:												
Olton	0-6	25-38	1.25-1.45	0.6-2	0.14-0.16	3.0-5.9	1.0-2.0	.32	.32	5	6	48
	6-17	35-45	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.4	.32	.32			
	17-41	30-40	1.35-1.50	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.2	.32	.32			
	41-80	25-35	1.35-1.50	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.2	.32	.32			
OcB:												
Olton	0-9	25-35	1.25-1.45	0.6-2	0.14-0.16	3.0-5.9	1.0-2.0	.32	.32	5	6	48
	9-25	35-45	1.25-1.45	0.2-0.6	0.16-0.18	3.0-5.9	0.5-1.0	.32	.32			
	25-34	30-40	1.35-1.50	0.2-0.6	0.18-0.20	3.0-5.9	0.1-0.5	.32	.32			
	34-80	25-35	1.35-1.50	0.2-0.6	0.18-0.20	3.0-5.9	0.1-0.3	.32	.32			
PcA:												
Pep	0-10	27-40	1.30-1.60	0.6-2	0.12-0.18	0.5-5.9	1.0-2.0	.32	.32	5	4L	86
	10-16	18-35	1.40-1.70	0.6-2	0.11-0.18	0.5-5.9	0.5-1.0	.32	.32			
	16-32	18-35	1.40-1.70	0.6-2	0.10-0.17	0.5-5.9	0.1-0.5	.32	.32			
	32-80	18-35	1.40-1.70	0.6-2	0.10-0.15	0.5-5.9	0.1-0.5	.32	.32			
PcB:												
Pep	0-9	27-40	1.30-1.60	0.6-2	0.12-0.18	0.5-5.9	1.0-2.0	.32	.32	5	4L	86
	9-15	18-35	1.40-1.70	0.6-2	0.11-0.18	0.5-5.9	0.5-1.0	.32	.32			
	15-31	18-35	1.40-1.70	0.6-2	0.10-0.17	0.5-5.9	0.1-0.5	.32	.32			
	31-80	18-35	1.40-1.70	0.6-2	0.10-0.15	0.5-5.9	0.1-0.5	.32	.32			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Particle size: Clay	Moist bulk density	Permeability (K-sat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors: Kw	Kf	T	Wind erodibility: group	index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
PeA:												
Pep------------------	0-7	15-25	1.25-1.40	0.6-2	0.14-0.16	0.0-2.9	1.0-2.0	.37	.37	5	4L	86
	7-20	27-35	1.40-1.50	0.6-2	0.18-0.20	3.0-5.9	0.1-1.0	.32	.32			
	20-80	27-35	1.40-1.55	0.6-2	0.18-0.20	3.0-5.9	0.1-0.5	.32	.32			
PeB:												
Pep------------------	0-14	15-25	1.25-1.40	0.6-2	0.14-0.16	0.0-2.9	1.0-2.0	.37	.37	5	4L	86
	14-30	20-35	1.40-1.50	0.6-2	0.15-0.17	0.0-2.9	0.1-1.0	.37	.37			
	30-80	27-35	1.40-1.55	0.6-2	0.18-0.20	3.0-5.9	0.1-0.5	.32	.32			
PMG:												
Potter---------------	0-4	15-27	1.30-1.55	0.6-2	0.14-0.16	0.0-2.9	0.5-1.0	.37	.37	1	4L	86
	4-9	18-28	1.35-1.60	0.2-0.6	0.10-0.13	0.0-2.9	0.1-0.5	.20	.37			
	9-80	12-28	1.40-1.60	0.6-2	0.05-0.07	0.0-2.9	0.0-0.0	.05	.37			
Mobeetie-------------	0-12	10-20	1.25-1.45	2-6	0.14-0.16	0.0-2.9	0.5-1.0	.37	.37	3	4L	86
	12-16	10-18	1.30-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	16-80	10-18	1.40-1.55	2-6	0.09-0.11	0.0-2.9	0.0-0.2	.24	.24			
PoA:												
Portales-------------	0-15	15-25	1.30-1.40	0.6-2	0.17-0.19	0.0-2.9	1.0-2.0	.37	.37	4	4L	86
	15-35	27-35	1.40-1.50	0.6-2	0.17-0.19	3.0-5.9	0.3-0.7	.32	.32			
	35-80	18-35	1.50-1.60	0.6-2	0.18-0.20	3.0-5.9	0.1-0.5	.32	.32			
PsA:												
Posey----------------	0-11	10-18	1.30-1.50	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.28	.28	3	3	86
	11-17	20-35	1.25-1.40	0.6-2	0.14-0.16	0.0-2.9	0.5-1.0	.37	.37			
	17-42	25-35	1.25-1.55	0.6-2	0.16-0.18	0.0-2.9	0.0-0.4	.32	.32			
	42-80	20-35	1.45-1.60	0.6-2	0.16-0.18	0.0-2.9	0.1-0.3	.32	.32			
PsB:												
Posey----------------	0-5	10-18	1.30-1.50	2-6	0.13-0.15	0.0-2.9	0.0-1.0	.28	.28	3	3	86
	5-33	20-35	1.25-1.40	0.6-2	0.14-0.16	0.0-2.9	0.5-1.0	.37	.37			
	33-49	25-35	1.25-1.55	0.6-2	0.16-0.18	0.0-2.9	0.0-0.4	.32	.32			
	49-80	20-35	1.45-1.60	0.6-2	0.16-0.18	0.0-2.9	0.0-0.0	.32	.32			
PsC:												
Posey----------------	0-12	10-18	1.30-1.50	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.28	.28	3	3	86
	12-22	25-35	1.25-1.40	0.6-2	0.14-0.16	0.0-2.9	0.5-1.0	.37	.37			
	22-38	25-35	1.25-1.55	0.6-2	0.16-0.18	0.0-2.9	0.2-0.5	.32	.32			
	38-80	20-35	1.45-1.60	0.6-2	0.16-0.18	0.0-2.9	0.1-0.4	.32	.32			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Particle size: Clay	Moist bulk density	Permea- bility (K-sat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors: Kw	Erosion factors: Kf	Erosion factors: T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
RaA:												
Randall-------------	0-17	50-70	1.20-1.40	0.00-0.06	0.12-0.18	10.0-25.0	0.5-2.0	.20	.20	5	7	38
	17-28	50-70	1.25-1.40	0.00-0.06	0.12-0.18	10.0-25.0	0.5-1.0	.20	.20			
	28-80	50-70	1.30-1.45	0.00-0.06	0.11-0.15	10.0-25.0	0.1-0.5	.20	.20			
RcA:												
Ranco---------------	0-5	40-50	1.20-1.40	0.00-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.20	.20	5	7	38
	5-12	40-50	1.25-1.40	0.00-0.06	0.12-0.18	9.0-25.0	0.5-1.0	.20	.20			
	12-80	40-50	1.30-1.45	0.00-0.06	0.11-0.15	9.0-25.0	0.1-0.5	.20	.20			
SaA:												
Slaughter-----------	0-6	20-27	1.30-1.50	0.6-2	0.14-0.16	3.0-5.9	1.0-3.0	.37	.37	1	6	48
	6-18	35-40	1.30-1.50	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.5	.32	.32			
	18-30	---	---	---	---	---	---	---	---			
	30-80	25-35	1.35-1.55	0.2-2	0.16-0.18	3.0-5.9	0.0-0.1	.32	.32			
SnC:												
Spantara------------	0-10	2-10	1.45-1.70	6-20	0.08-0.10	0.0-2.9	0.3-0.8	.10	.10	5	2	134
	10-45	10-18	1.40-1.60	2-6	0.10-0.14	0.0-2.9	0.2-0.5	.24	.24			
	45-80	10-18	1.40-1.60	2-6	0.10-0.14	0.0-2.9	0.1-0.2	.17	.17			
SpA:												
Sparenberg----------	0-4	40-50	1.20-1.40	0.00-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.20	.20	5	7	38
	4-12	40-50	1.25-1.40	0.00-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.20	.20			
	12-46	40-50	1.30-1.45	0.00-0.06	0.11-0.15	9.0-25.0	0.1-1.0	.20	.20			
	46-80	40-50	1.30-1.50	0.00-0.06	0.11-0.15	9.0-25.0	0.1-0.5	.20	.20			
SsA:												
Sparks--------------	0-6	18-27	1.30-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.37	.37	5	5	56
	6-18	35-50	1.60-1.65	0.06-0.2	0.15-0.19	3.0-5.9	0.5-1.0	.20	.20			
	18-80	27-35	1.50-1.55	0.2-0.6	0.19-0.21	3.0-5.9	0.2-0.5	.32	.32			
W:												
Water---------------	---	---	---	---	---	---	---	---	---	--	---	---

Table 18.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
10:							
Regnier---------------	0-3	8.0-20	7.4-8.4	10-25	0-5	0.0-2.0	0-1
	3-12	10-25	7.4-8.4	15-30	0-5	0.0-4.0	0-3
	12-60	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---
Lacoca---------------	0-8	3.0-15	7.9-8.4	5-30	0-2	0.0-2.0	0-1
	8-60	---	---	---	---	---	---
11:							
Tucumcari------------	0-5	15-25	6.6-8.4	0-1	0-1	0.0-2.0	0-1
	5-19	15-28	7.4-8.4	0-1	0-1	0.0-2.0	0-1
	19-49	14-30	7.4-8.4	5-15	0-1	0.0-2.0	0-1
	49-60	14-30	7.4-8.4	5-15	0-5	0.0-4.0	0-1
Hassell--------------	0-4	15-30	7.4-8.4	0-1	0-2	0.0-2.0	0-1
	4-22	18-35	7.9-8.4	1-10	0-2	0.0-2.0	0-1
	22-32	18-35	7.9-8.4	5-30	0-5	0.0-2.0	0-1
	32-60	---	---	---	---	---	---
13:							
Tucumcari------------	0-5	9.0-20	6.6-8.4	0-1	0-1	0.0-2.0	0-1
	5-19	15-28	7.4-8.4	0-1	0-1	0.0-2.0	0-1
	19-49	12-30	7.4-8.4	5-15	0-1	0.0-2.0	0-1
	49-60	15-30	7.4-8.4	5-15	0-5	0.0-4.0	0-1
Redona---------------	0-4	7.0-18	7.4-8.4	0-2	0-1	0.0-2.0	0-1
	4-23	15-25	7.4-8.4	0-20	0-1	0.0-2.0	0-1
	23-60	15-22	7.4-8.4	15-35	0-5	0.0-2.0	0-1
28:							
Lacoca---------------	0-12	3.0-15	7.9-8.4	5-15	0-1	0.0-2.0	0-1
	12-60	---	---	---	---	---	---
San Jon--------------	0-6	8.0-20	7.4-9.0	3-10	0-1	0.0-2.0	0-1
	6-33	11-24	7.4-9.0	15-35	0-3	0.0-2.0	0-1
	33-60	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---
31:							
Chispa---------------	0-7	8.0-15	7.9-8.4	10-15	0	0.0-2.0	0-2
	7-43	10-20	7.9-8.4	10-20	0	0.0-4.0	0-2
	43-60	6.0-20	7.9-8.4	15-45	0	0.0-8.0	0-2
Redona---------------	0-8	5.0-10	7.4-8.4	0-2	0	0.0-2.0	0-2
	8-60	15-25	7.4-8.4	5-25	0-1	0.0-2.0	0-2
32:							
Regnier--------------	0-8	8.0-20	7.4-8.4	5-10	0-2	0.0-2.0	0-1
	8-12	10-23	7.4-8.4	15-25	0-5	0.0-4.0	0-1
	12-60	---	---	---	---	---	---
Lacoca---------------	0-5	3.0-15	7.9-8.4	5-10	0-1	0.0-2.0	0-1
	5-60	---	---	10-30	0-2	0.0-2.0	0-1
Rock outcrop---------	0-60	---	---	---	---	---	---

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
36:							
Alama-----------------	0-3	12-26	7.4-8.4	0-5	0-1	0.0-2.0	0-1
	3-28	11-26	7.4-8.4	5-10	0-1	0.0-2.0	0-1
	28-60	11-26	7.9-8.4	5-15	0-2	0.0-2.0	0-1
37:							
Ima-------------------	0-12	5.0-10	7.4-7.8	0-4	0	0.0-2.0	0-2
	12-60	5.0-10	7.4-8.4	5-15	0	0.0-2.0	0-2
Gallen----------------	0-5	6.0-15	7.4-8.4	5-10	0	0.0-2.0	0-1
	5-20	4.0-10	7.4-8.4	5-10	0-1	0.0-2.0	0-1
	20-60	0.0-1.0	7.4-8.4	15-25	0-1	0.0-2.0	0-1
58:							
Redona----------------	0-6	5.0-15	7.4-8.4	0-1	0	0.0-2.0	0-2
	6-60	15-25	7.4-8.4	5-25	0-1	0.0-2.0	0-2
Armesa----------------	0-2	10-25	7.9-8.4	10-15	0	0.0-2.0	0-2
	2-60	6.0-15	7.9-8.4	45-65	0	0.0-2.0	0-2
60:							
Chispa----------------	0-7	8.0-15	7.9-8.4	10-15	0	0.0-2.0	0-2
	7-32	10-20	7.9-8.4	10-20	0	0.0-4.0	0-2
	32-60	6.0-20	7.9-8.4	15-45	0	0.0-8.0	0-2
Armesa----------------	0-10	6.0-20	7.9-8.4	10-15	0	0.0-2.0	0-2
	10-60	6.0-15	7.9-8.4	45-65	0	0.0-2.0	0-2
Redona----------------	0-6	5.0-10	7.4-8.4	0-2	0	0.0-2.0	0-2
	6-60	15-25	7.4-8.4	5-25	0-1	0.0-2.0	0-2
61:							
Berwolf---------------	0-11	4.0-10	7.4-7.8	0-1	0	0.0-2.0	0-2
	11-42	4.0-10	7.9-8.4	1-5	0	0.0-2.0	0-2
	42-60	3.0-9.0	7.9-8.4	10-25	0-1	0.0-2.0	0-2
Roswell---------------	0-8	3.0-7.0	6.6-7.8	0-1	0	0.0-2.0	0
	8-60	2.0-6.0	6.6-8.4	0-2	0	0.0-2.0	0
AcA:							
Acuff-----------------	0-9	10-25	6.6-7.3	0-2	0	0.0-1.0	0-1
	9-16	15-25	7.4-7.8	0-5	0	0.0-1.0	0-1
	16-33	15-25	7.4-7.8	5-10	0	0.0-1.0	0-1
	33-80	15-25	7.9-8.4	20-60	0	0.0-1.0	0-2
AcB:							
Acuff-----------------	0-7	10-25	6.6-7.3	0-2	0	0.0-1.0	0-1
	7-33	15-25	7.4-7.8	0-5	0	0.0-1.0	0-1
	33-80	15-25	7.9-8.4	20-60	0	0.0-1.0	0-1
AfA:							
Amarillo--------------	0-9	5.0-10	6.6-7.8	0-2	0	0.0-1.0	0-1
	9-42	10-20	7.4-7.8	0-20	0	0.0-1.0	0-2
	42-80	10-20	7.9-8.4	30-50	0	0.0-1.0	0-2
AfB:							
Amarillo--------------	0-10	5.0-10	6.6-7.8	0-1	0	0.0-1.0	0-1
	10-35	10-20	7.4-7.8	0-5	0	0.0-1.0	0-1
	35-80	10-15	7.9-8.4	20-50	0	0.0-2.0	0-1

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
AnB:							
Amarillo-------------	0-7	3.0-7.0	6.6-7.8	0-1	0	0.0-1.0	0-1
	7-37	10-20	7.4-7.8	0-5	0	0.0-1.0	0-1
	37-80	10-20	7.9-8.4	30-50	0	0.0-1.0	0-1
AvA:							
Arvana---------------	0-8	5.0-15	6.6-8.4	0-1	0	0.0-4.0	0-4
	8-17	10-20	7.4-8.4	0-2	0	0.0-2.0	0-4
	17-31	10-15	7.4-8.4	0-5	0	0.0-2.0	0-4
	31-35	---	---	---	---	---	---
	35-80	10-20	7.9-8.4	20-60	0-5	0.0-1.0	0-1
BcA:							
Bippus---------------	0-13	10-20	7.4-8.4	0-2	0-1	0.0-1.0	0-4
	13-23	10-20	7.9-8.4	0-5	0	0.0-2.0	0
	23-80	10-20	7.4-8.4	5-15	0-5	0.0-2.0	0-4
DRC:							
Drake----------------	0-7	10-20	7.4-8.4	2-15	0-2	0.0-4.0	0-7
	7-28	10-20	7.9-9.0	5-20	0-4	0.0-4.0	0-13
	28-55	10-15	7.9-9.0	15-30	0-4	0.0-4.0	0-13
	55-80	10-15	7.9-9.0	10-30	0-4	0.0-4.0	0-13
EsA:							
Estacado-------------	0-11	7.0-15	7.4-8.4	2-10	0	0.0-1.0	0-10
	11-20	10-20	7.4-8.4	2-10	0	0.0-1.0	0-1
	20-80	10-20	7.9-8.4	20-40	0-1	0.0-1.0	0-1
EsB:							
Estacado-------------	0-13	7.0-15	7.4-8.4	2-10	0	0.0-1.0	0
	13-22	10-20	7.4-8.4	2-10	0	0.0-1.0	0
	22-30	10-20	7.9-8.4	30-45	0	0.0-1.0	0-1
	30-80	10-20	7.9-8.4	15-40	0-1	0.0-2.0	0-1
FrA:							
Friona---------------	0-6	5.0-15	6.6-8.4	0-1	0	0.0-1.0	0-1
	6-24	15-25	7.4-8.4	0-1	0	0.0-1.0	0-1
	24-30	10-20	7.4-8.4	2-10	0	0.0-1.0	0-1
	30-41	---	---	---	---	---	---
	41-80	10-20	7.9-8.4	20-50	0-5	0.0-1.0	0-1
GoB:							
Gomez----------------	0-12	2.0-5.0	7.4-8.4	5-15	0	0.0-2.0	0-2
	12-20	5.0-15	7.9-8.4	10-30	0-1	0.0-2.0	0-2
	20-23	5.0-10	7.9-8.4	10-30	0	0.0-2.0	0-2
	23-47	2.0-10	7.9-8.4	30-50	0-2	0.0-2.0	0-5
	47-80	2.0-5.0	7.4-8.4	10-30	0	0.0-2.0	0-2
GrA:							
Grier----------------	0-4	25-35	7.9-8.4	15-30	0-1	0.0-4.0	0-4
	4-18	10-25	7.9-9.0	20-40	0-1	2.0-6.0	0-4
	18-35	10-25	7.4-8.4	20-40	0-2	4.0-8.0	4-8
	35-80	10-25	7.9-9.0	20-40	0-4	4.0-8.0	10-20
KmB:							
Kimberson------------	0-5	6.0-10	7.4-8.4	5-20	0	0.0-2.0	0-1
	5-14	6.0-10	7.4-8.4	20-40	0	0.0-2.0	0-1
	14-20	---	---	---	---	---	---
	20-80	6.0-10	7.4-8.4	30-60	0-1	0.0-2.0	0-1

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
LcA:							
Lazbuddie------------	0-10	20-40	7.4-8.4	1-3	0	0.0-2.0	0-4
	10-45	20-40	7.4-8.4	1-5	0	0.0-2.0	0-4
	45-80	20-40	7.4-8.4	5-15	0-5	0.0-2.0	0-4
LoA:							
Lofton---------------	0-6	15-35	6.6-8.4	0-1	0	0.0-2.0	0-1
	6-25	15-35	7.4-8.4	0-5	0	0.0-2.0	0-1
	25-80	15-25	7.9-8.4	15-40	0-2	0.0-2.0	0-2
McA:							
Mclean---------------	0-6	40-60	7.4-8.4	1-3	0	0.0-2.0	0-1
	6-41	40-60	7.4-8.4	1-5	0	0.0-2.0	0-1
	41-61	40-60	7.9-8.4	5-15	0	0.0-2.0	0-1
	61-80	40-60	7.9-8.4	5-15	0-1	0.0-2.0	0-1
MsD:							
Milsand--------------	0-6	3.6-9.8	6.6-8.4	0-3	0	0.0-2.0	0
	6-30	3.6-9.3	6.6-8.4	0-3	0	0.0-2.0	0
	30-80	1.6-8.0	6.6-8.4	0-3	0	0.0-2.0	0
MsE:							
Milsand--------------	0-8	2.0-4.0	7.4-8.4	3-6	0	0.0-1.0	0-1
	8-30	2.0-4.0	7.4-8.4	3-6	0	0.0-1.0	0-1
	30-37	2.0-4.0	7.5-8.4	3-10	0	0.0-2.0	0-1
	37-80	2.0-4.0	7.9-8.4	3-10	0	0.0-2.0	0-1
Arch-----------------	0-6	1.0-7.5	6.8-7.9	10-25	0	0.0-1.0	0-1
	6-16	10-20	7.4-7.9	30-50	0-2	0.0-2.0	0-1
	16-37	10-20	7.4-8.4	40-60	0-2	0.0-4.0	0-2
	37-80	10-20	7.4-8.4	40-60	0-2	0.0-4.0	0-2
NtC:							
Nutivoli-------------	0-6	1.0-1.0	6.6-7.8	0-1	0	0.0-1.0	0
	6-80	1.0-1.0	6.6-7.8	0-1	0	0.0-1.0	0-1
NtD:							
Nutivoli-------------	0-28	1.0-4.0	6.6-7.8	0-1	0	0.0-2.0	0
	28-80	1.0-4.0	6.6-7.8	0-1	0	0.0-2.0	0-1
OcA:							
Olton----------------	0-6	10-25	6.6-7.3	0-1	0	0.0-1.0	0-1
	6-17	20-30	7.4-7.8	0-5	0	0.0-1.0	0-1
	17-41	15-25	7.4-7.8	5-10	0	0.0-1.0	0-1
	41-80	15-25	7.9-8.4	20-50	0-4	0.0-2.0	0-1
OcB:							
Olton----------------	0-9	10-25	6.6-7.3	0-1	0	0.0-1.0	0-1
	9-25	20-30	7.4-7.8	0-5	0	0.0-1.0	0-1
	25-34	15-25	7.4-7.8	5-10	0	0.0-1.0	0-1
	34-80	15-25	7.9-8.4	20-50	0-2	0.0-1.0	0-1
PcA:							
Pep------------------	0-10	10-15	7.4-8.4	2-5	0	0.0-2.0	0
	10-16	10-15	7.4-8.4	5-15	0	0.0-2.0	0
	16-32	10-15	7.4-8.4	5-30	0	0.0-2.0	0
	32-80	10-15	7.8-8.4	15-40	0	0.0-2.0	0

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
PcB:							
Pep	0-9	10-15	7.4-8.4	2-5	0	0.0-2.0	0
	9-15	10-15	7.4-8.4	5-15	0	0.0-2.0	0
	15-31	10-15	7.4-8.4	5-30	0	0.0-2.0	0
	31-80	10-15	7.8-8.4	15-40	0	0.0-2.0	0
PeA:							
Pep	0-7	10-15	7.4-8.4	5-15	0	0.0-1.0	0-1
	7-20	10-20	7.4-8.4	10-25	0	0.0-1.0	0-1
	20-80	10-20	7.4-8.4	25-40	0-1	0.0-2.0	0-1
PeB:							
Pep	0-14	10-15	7.4-8.4	5-15	0	0.0-2.0	0-1
	14-30	10-20	7.4-8.4	10-25	0	0.0-2.0	0-1
	30-80	10-20	7.4-8.4	25-40	0-1	0.0-2.0	0-2
PMG:							
Potter	0-4	5.0-10	7.9-8.4	5-20	0	0.0-2.0	0-2
	4-9	5.0-15	7.9-8.4	40-60	0	0.0-2.0	0-4
	9-80	5.0-15	7.9-8.4	50-80	0-5	0.0-2.0	0-4
Mobeetie	0-12	5.0-15	7.4-7.8	0-10	0	0.0-2.0	0-2
	12-16	5.0-15	7.9-8.4	5-10	0-1	0.0-2.0	0-2
	16-80	5.0-15	7.9-8.4	10-15	0-1	0.0-2.0	0-2
PoA:							
Portales	0-15	15-20	7.4-8.4	5-15	0	0.0-1.0	0-1
	15-35	15-20	7.4-8.4	5-15	0	0.0-1.0	0-1
	35-80	10-15	7.4-8.4	15-40	0-1	0.0-2.0	0-1
PsA:							
Posey	0-11	5.0-15	7.9-8.4	5-20	0	0.0-1.0	0-1
	11-17	8.0-15	7.4-8.4	5-15	0	0.0-1.0	0-1
	17-42	10-20	7.9-8.4	10-30	0	0.0-1.0	0-1
	42-80	10-20	7.9-8.4	30-50	0-2	0.0-2.0	0-2
PsB:							
Posey	0-6	5.0-15	7.9-8.4	5-20	0-1	0.0-1.0	0-4
	6-13	8.0-15	7.4-8.4	5-15	0-1	0.0-1.0	0-4
	13-52	10-20	7.9-8.4	10-30	0-2	0.0-1.0	0-4
	52-80	10-20	7.9-8.4	30-50	0-5	0.0-2.0	0-4
PsC:							
Posey	0-12	5.0-15	6.8-7.9	5-15	0	0.0-1.0	0-1
	12-22	8.0-15	7.4-8.4	5-15	0	0.0-1.0	0-1
	22-38	10-20	7.9-8.4	10-30	0	0.0-1.0	0-1
	38-80	10-20	7.9-8.4	30-50	0-1	0.0-2.0	0-2
RaA:							
Randall	0-17	40-50	7.4-8.4	1-3	0	0.0-2.0	0-1
	17-28	40-50	7.4-8.4	1-5	0	0.0-2.0	0-1
	28-80	40-50	7.9-8.4	5-15	0-2	0.0-2.0	0-1
RcA:							
Ranco	0-5	40-50	7.4-8.4	1-3	0	0.0-2.0	0
	5-12	40-50	7.4-8.4	1-5	0	0.0-2.0	0
	12-80	40-50	7.9-8.4	5-15	0-1	0.0-2.0	0-1

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
SaA:							
Slaughter-------------	0-6	8.0-20	6.6-8.4	0-1	0	0.0-1.0	0-1
	6-18	15-25	7.4-8.4	0-10	0-1	0.0-1.0	0-4
	18-30	---	---	---	---	---	---
	30-80	10-20	7.4-8.4	20-50	0-2	0.0-4.0	0-4
SnC:							
Spantara--------------	0-10	2.0-6.0	6.6-7.8	0-1	0	0.0-1.0	0
	10-45	5.0-10	6.6-8.4	0-5	0	0.0-1.0	0
	45-80	5.0-10	6.6-8.4	0-20	0	0.0-1.0	0-1
SpA:							
Sparenberg------------	0-4	40-60	7.4-8.4	1-3	0	0.0-2.0	0
	4-12	40-60	7.4-8.4	1-5	0	0.0-2.0	0
	12-46	40-50	7.9-8.4	5-15	0	0.0-2.0	0
	46-80	40-50	7.9-8.4	5-15	0	0.0-2.0	0
SsA:							
Sparks----------------	0-6	9.0-20	6.6-7.3	0-1	0	0.0-2.0	0-1
	6-18	15-30	6.6-7.8	0-5	0	0.0-2.0	0-1
	18-80	10-20	7.9-8.4	1-30	0-1	0.0-2.0	0-1
W:							
Water-----------------	---	---	---	---	---	---	---

Table 19.--Water Features

(Depths of layers are in feet)

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
10:									
Regnier	D								
		All months	---	---	---	---	---	---	---
Rock outcrop	---								
		All months	---	---	---	---	---	---	---
Lacoca	D								
		All months	---	---	---	---	---	---	---
11:									
Tucumcari	C								
		All months	---	---	---	---	---	---	---
Hassell	D								
		All months	---	---	---	---	---	---	---
13:									
Tucumcari	C								
		All months	---	---	---	---	---	---	---
Redona	B								
		All months	---	---	---	---	---	---	---
28:									
Lacoca	D								
		All months	---	---	---	---	---	---	---
San jon	C								
		All months	---	---	---	---	---	---	---
Rock outcrop	D								
		All months	---	---	---	---	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
31:									
Chispa	B								
		All months	---	---	---	---	---	---	---
Redona	B								
		All months	---	---	---	---	---	---	---
32:									
Regnier	D								
		All months	---	---	---	---	---	---	---
Lacoca	D								
		All months	---	---	---	---	---	---	---
Rock outcrop	D								
		All months	---	---	---	---	---	---	---
36:									
Alama	C								
		All months	---	---	---	---	---	---	---
37:									
Ima	A								
		All months	---	---	---	---	---	---	---
Gallen	A								
		All months	---	---	---	---	---	---	---
58:									
Redona	B								
		All months	---	---	---	---	---	---	---
Armesa	B								
		All months	---	---	---	---	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
60:									
Chispa	B								
		All months	---	---	---	---	---	---	---
Armesa	B								
		All months	---	---	---	---	---	---	---
Redona	B								
		All months	---	---	---	---	---	---	---
61:									
Berwolf	B								
		All months	---	---	---	---	---	---	---
Roswell	A								
		All months	---	---	---	---	---	---	---
AcA:									
Acuff	B								
		All months	---	---	---	---	---	---	---
AcB:									
		All months	---	---	---	---	---	---	---
AfA:									
Amarillo	B								
		All months	---	---	---	---	---	---	---
AfB:									
		All months	---	---	---	---	---	---	---
AnB:									
		All months	---	---	---	---	---	---	---
AvA:									
Arvana	C								
		All months	---	---	---	---	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
BcA:									
Bippus	B								
		Jan-Mar	---	---	---	---	None	---	---
		Apr-Oct	---	---	---	---	None	---	Rare
		Nov-Dec	---	---	---	---	None	---	---
DRC:									
Drake	B								
		All months	---	---	---	---	---	---	---
EsA:									
Estacado	B								
		All months	---	---	---	---	---	---	---
EsB:									
		All months	---	---	---	---	---	---	---
FrA:									
Friona	C								
		All months	---	---	---	---	---	---	---
GoB:									
Gomez	B								
		All months	---	---	---	---	---	---	---
GrA:									
Grier	D								
		Apr-Aug	0.8-3.0	> 5.0	0.0-0.5	Long	Occasional	---	---
		Sep-Oct	0.8-3.0	> 5.0	0.0-0.5	Long	Frequent	---	---
KmB:									
Kimberson	D								
		All months	---	---	---	---	---	---	---
LcA:									
Lazbuddie	D								
		May-Sep	---	---	0.0-1.0	---	Rare	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
LoA:									
Lofton	C								
		All months	---	---	---	---	---	---	---
McA:									
Mclean	D								
		Apr	---	---	0.0-0.6	Very brief	Occasional	---	---
		May-Sep	---	---	0.0-1.0	Brief	Occasional	---	---
		Oct	---	---	0.0-0.6	Very brief	Occasional	---	---
MsD:									
Milsand	A								
		All months	---	---	---	---	---	---	---
MsE:									
Milsand	A								
		All months	---	---	---	---	---	---	---
Arch	B								
		All months	---	---	---	---	---	---	---
NtC:									
Nutivoli	A								
		All months	---	---	---	---	---	---	---
NtD:									
		All months	---	---	---	---	---	---	---
OcA:									
Olton	C								
		All months	---	---	---	---	---	---	---
OcB:									
		All months	---	---	---	---	---	---	---
PcA:									
Pep	B								
		All months	---	---	---	---	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
PcB:									
Pep	B								
		All months	---	---	---	---	---	---	---
PeA:									
Pep	B								
		All months	---	---	---	---	---	---	---
PeB:									
Pep	B								
		All months							
PMG:									
Potter	B								
		All months	---	---	---	---	---	---	---
Mobeetie	A								
		All months	---	---	---	---	---	---	---
PoA:									
Portales	B								
		All months	---	---	---	---	---	---	---
PsA:									
Posey	B								
		All months	---	---	---	---	---	---	---
PsB:									
		All months	---	---	---	---	---	---	---
PsC:									
		All months	---	---	---	---	---	---	---
RaA:									
Randall	D								
		Apr	1.0-1.5	2.0-3.0	0.0-1.0	Brief	Frequent	---	---
		May-Jun	0.0-0.5	2.0-3.0	0.0-3.0	Long	Frequent	---	---
		Jul-Aug	---	---	0.0-3.0	Long	Frequent	---	---
		Sep	0.0-0.5	2.0-3.0	0.0-3.0	Long	Frequent	---	---
		Oct	0.0-0.5	2.0-3.0	0.0-1.0	Brief	Frequent	---	---
		Nov	1.0-1.5	2.0-3.0	---	---	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
RcA:									
Ranco	D								
		Apr	1.0-1.5	2.0-3.0	0.0-1.0	Brief	Frequent	---	---
		May-Jun	0.0-0.5	2.0-3.0	0.0-3.0	Long	Frequent	---	---
		Jul-Aug	---	---	0.0-3.0	Long	Frequent	---	---
		Sep	0.0-0.5	2.0-3.0	0.0-3.0	Long	Frequent	---	---
		Oct	0.0-0.5	2.0-3.0	0.0-1.0	Brief	Frequent	---	---
		Nov	1.0-1.5	2.0-3.0	---	---	---	---	---
SaA:									
Slaughter	D								
		All months	---	---	---	---	---	---	---
SnC:									
Spantara	A								
		All months	---	---	---	---	---	---	---
SpA:									
Sparenberg	D								
		Apr	---	---	0.0-0.6	Very brief	Occasional	---	---
		May-Sep	---	---	0.0-1.0	Brief	Occasional	---	---
		Oct	---	---	0.0-0.6	Very brief	Occasional	---	---
SsA:									
Sparks	C								
		All months	---	---	---	---	---	---	---
W:									
Water	---								
		All months	---	---	---	---	---	---	---

Table 20.--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		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
10:					
Regnier	Paralithic bedrock	12-20	Low	High	Low
Rock outcrop	Lithic bedrock	0-0	---	---	---
Lacoca	Lithic bedrock	4-20	Low	Moderate	Low
11:					
Tucumcari	---	---	Low	High	Low
Hassell	Paralithic bedrock	20-40	Low	High	Low
13:					
Tucumcari	---	---	Low	High	Low
Redona	---	---	Low	Moderate	Low
28:					
Lacoca	Lithic bedrock	4-20	Low	Moderate	Low
San Jon	Paralithic bedrock	20-40	Low	High	Low
Rock outcrop	Lithic bedrock	0-0	---	---	---
31:					
Chispa	---	---	---	High	Low
Redona	---	---	Low	Moderate	Low
32:					
Regnier	Paralithic bedrock	12-20	Low	High	Low
Lacoca	Lithic bedrock	4-20	---	Moderate	Low
Rock outcrop	Lithic bedrock	0-0	---	---	---
36:					
Alama	---	---	Low	High	Low
37:					
Ima	---	---	Low	High	Low
Gallen	---	---	Low	High	Low
58:					
Redona	---	---	Low	Moderate	Low
Armesa	---	---	Low	High	Low
60:					
Chispa	---	---	Low	High	Low
Armesa	---	---	Low	High	Low
Redona	---	---	Low	Moderate	Low

Table 20.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In			
61:					
Berwolf	---	---	Low	High	Low
Roswell	---	---	Low	Moderate	Low
AcA:					
Acuff	---	---	Low	High	Low
AcB:					
Acuff	---	---	Low	High	Low
AfA:					
Amarillo	---	---	Low	High	Low
AfB:					
Amarillo	---	---	Low	High	Low
AnB:					
Amarillo	---	---	Low	High	Low
AvA:					
Arvana	Petrocalcic	20-40	Low	High	Low
BcA:					
Bippus	---	---	Low	Moderate	Low
DRC:					
Drake	---	---	None	High	Low
EsA:					
Estacado	---	---	Low	High	Low
EsB:					
Estacado	---	---	Low	High	Low
FrA:					
Friona	Petrocalcic	20-40	Low	High	Low
GoB:					
Gomez	---	---	Low	High	High
GrA:					
Grier	---	---	Low	High	Moderate
KmB:					
Kimberson	Petrocalcic	10-20	Low	High	Low
LcA:					
Lazbuddie	---	---	Low	High	Low
LoA:					
Lofton	---	---	Low	High	Low
McA:					
McLean	---	---	None	High	Low
MsD:					
Milsand	---	---	None	Low	Low
MsE:					
Milsand	---	---	Low	Moderate	Low
Arch	---	---	Low	Moderate	Low

Table 20.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
NtC:					
Nutivoli	---	---	Low	High	Low
NtD:					
Nutivoli	---	---	Low	High	Low
OcA:					
Olton	---	---	Low	High	Low
OcB:					
Olton	---	---	Low	High	Low
PcA:					
Pep	---	---	None	High	Low
PcB:					
Pep	---	---	None	High	Low
PeA:					
Pep	---	---	Low	High	Low
PeB:					
Pep	---	---	Low	High	Low
PMG:					
Potter	---	---	Low	Moderate	Low
Mobeetie	---	---	Low	Low	Low
PoA:					
Portales	---	---	Low	High	Low
PsA:					
Posey	---	---	Low	High	Low
PsB:					
Posey	---	---	Low	High	Low
PsC:					
Posey	---	---	Low	High	Low
RaA:					
Randall	---	---	Low	High	Low
RcA:					
Ranco	---	---	None	High	Low
SaA:					
Slaughter	Petrocalcic	9-20	Low	High	Low
SnC:					
Spantara	---	---	Low	High	Low
SpA:					
Sparenberg	---	---	None	High	Low
SsA:					
Sparks	---	---	Low	High	Low
W:					
Water	---	---	---	---	---

Table 21.--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
Acuff	Fine-loamy, mixed, superactive, thermic Aridic Paleustolls
Alama	Fine-silty, mixed, superactive, thermic Ustic Haplocambids
Amarillo	Fine-loamy, mixed, superactive, thermic Aridic Paleustalfs
Arch	Fine-loamy, carbonatic, thermic Aridic Calciustepts
Armesa	Fine-loamy, carbonatic, thermic Ustic Haplocalcids
Arvana	Fine-loamy, mixed, superactive, thermic Petrocalcic Paleustalfs
Berwolf	Coarse-loamy, mixed, superactive, thermic Ustic Calciargids
Bippus	Fine-loamy, mixed, superactive, thermic Cumulic Haplustolls
Chispa	Fine-loamy, mixed, superactive, thermic Ustic Haplocalcids
Drake	Fine-loamy, mixed, superactive, thermic Aridic Calciustepts
Estacado	Fine-loamy, mixed, superactive, thermic Aridic Paleustolls
Friona	Fine-loamy, mixed, superactive, thermic Petrocalcic Paleustolls
Gallen	Loamy-skeletal, mixed, superactive, thermic Ustic Haplocalcids
Gomez	Coarse-loamy, mixed, active, thermic Aridic Calciustepts
Grier	Fine-loamy, mixed, superactive, calcareous, thermic Typic Endoaquepts
Hassell	Fine, smectitic, thermic Ustertic Haplargids
Ima	Coarse-loamy, mixed, superactive, thermic Ustic Haplocambids
Kimberson	Loamy, mixed, superactive, thermic, shallow Petrocalcic Calciustolls
Lacoca	Loamy, mixed, superactive, calcareous, thermic Lithic Ustic Torriorthents
Lazbuddie	Fine, smectitic, thermic Calcic Haplusterts
Lofton	Fine, mixed, superactive, thermic Vertic Argiustolls
McLean	Fine, smectitic, thermic Udic Haplusterts
Milsand	Mixed, thermic Aridic Ustipsamments
Mobeetie	Coarse-loamy, mixed, superactive, thermic Aridic Haplustepts
Nutivoli	Mixed, thermic Aridic Ustipsamments
Olton	Fine, mixed, superactive, thermic Aridic Paleustolls
Pep	Fine-loamy, mixed, superactive, thermic Aridic Calciustolls
Portales	Fine-loamy, mixed, superactive, thermic Aridic Calciustolls
Posey	Fine-loamy, mixed, superactive, thermic Calcidic Paleustalfs
Potter	Loamy-skeletal, carbonatic, thermic Petronodic Ustic Haplocalcids
Ranco	Fine, smectitic, thermic Ustic Epiaquerts
Randall	Fine, smectitic, thermic Ustic Epiaquerts
Redona	Fine-loamy, mixed, superactive, thermic Ustic Calciargids
Regnier	Loamy, mixed, superactive, calcareous, thermic, shallow Ustic Torriorthents
Roswell	Mixed, thermic Ustic Torripsamments
San Jon	Fine-loamy, mixed, superactive, thermic Ustic Haplocalcids
Slaughter	Clayey, mixed, superactive, thermic, shallow Petrocalcic Paleustolls
Spantara	Coarse-loamy, mixed, superactive, thermic Aridic Haplustalfs
Sparenberg	Fine, smectitic, thermic Udic Haplusterts
Sparks	Fine, mixed, superactive, thermic Aridic Paleustalfs
Tucumcari	Fine, smectitic, thermic Ustertic Haplargids

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