United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with the
Colorado Agricultural
Experiment Station

Soil Survey of Kit Carson County, Colorado

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.

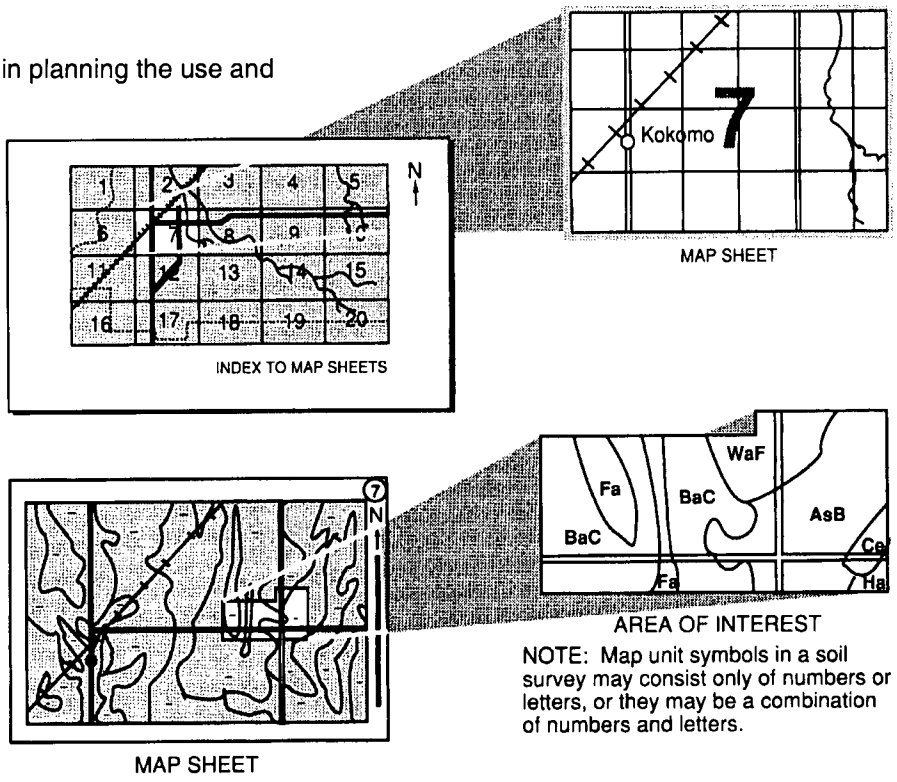
Detailed Soil Maps

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 turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn 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.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

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 (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1992. Soil names and descriptions were approved in 1994. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1992. This survey was made cooperatively by the Natural Resources Conservation Service and the Colorado Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Burlington and Flagler Conservation Districts. The Kit Carson County Commissioners and the Burlington and Flagler Conservation Districts also provided financial assistance for this survey.

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.

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Cover: Harvesting nonirrigated wheat in an area of Kuma-Keith silt loams, 0 to 2 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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Foreword

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

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

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

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described, 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 the Cooperative Extension Service.

Allen Green
State Conservationist
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Soil Survey of
Kit Carson County, Colorado

By James W. Borchert, Natural Resources Conservation Service

Fieldwork by James W. Borchert, Everett E. Geib, Gregory L. Snell, Steven W. Fischer, Dennis L. Moore, Laura L. Merkel, Robert D. Busby, and Timothy J. Wheeler, Natural Resources Conservation Service

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

KIT CARSON COUNTY is about 60 miles wide from east to west and 36 miles long from north to south. The survey area includes 1,382,600 acres, or about 2,160 square miles. It is in the Great Plains. It is bordered on the west by Lincoln County; on the south by Cheyenne County; on the north by Washington and Yuma Counties; and on the east by Cheyenne, Sherman, and Wallace Counties, Kansas (fig. 1). The landscape generally is nearly level to steep. Elevation is 5,200 feet in the southwestern part of the county. It gradually decreases to 3,740 feet in the northeastern part.

A previous survey, "Physical Land Conditions in Kit Carson County, Colorado," was published in 1949. This earlier survey covers part of the present survey area. The present survey, however, updates the earlier survey and provides additional information and larger maps that show the soils in greater detail.

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

General Nature of the County

The paragraphs that follow give general information about Kit Carson County. They describe natural resources, agriculture, history, physiography and drainage, geology, and climate.

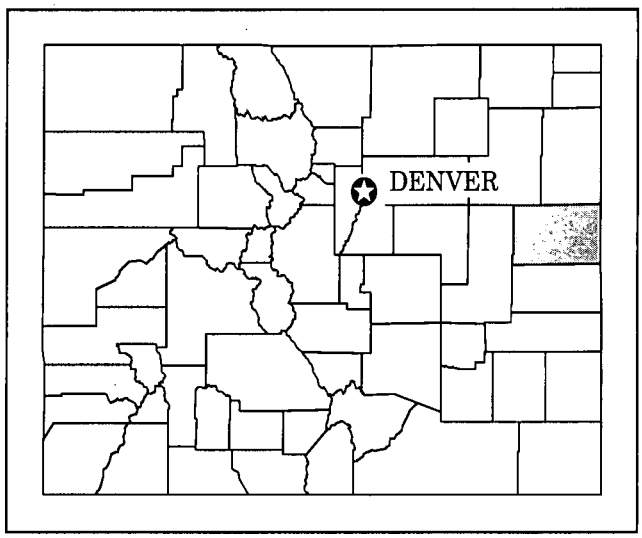

Figure 1.—Location of Kit Carson County in Colorado.

Natural Resources

Soil is the most important natural resource in the county. It provides a medium for growing crops and for the grasses grazed by livestock. If managed and used properly, the soil is a sustainable resource.

Irrigation water is available from the Ogallala Formation in the eastern two-thirds of the county. Recharge of the Ogallala aquifer is minor or nonexistent. The ground water level continues to decline but at a slower rate than in the early years of

irrigation. In recent years, improvements in technology and equipment have greatly improved the efficiency of irrigation.

Other resources include sand, gravel, and oil. Sand is available from stream channels, and gravel is removed from the Ogallala Formation where it is exposed or near the surface.

Agriculture

About 64 percent of the survey area is cultivated, and the remaining acres are in range. Silty soils are dominant. Loamy soils are adjacent to the major drainageways or are in areas where the loess is thin or mixed with loamy soils. Sandy soils are dominantly north of Stratton and Bethune on the border of Yuma County.

About 48 percent is nonirrigated cropland, and about 16 percent is irrigated cropland. Winter wheat is the major crop. Corn, sunflowers, dry beans, alfalfa, and other crops also are grown.

The main nonirrigated crop is winter wheat. Sunflowers, corn, millet, and other crops also are grown. A winter wheat and summer fallow crop rotation is widely practiced.

The main irrigated crop is corn. Winter wheat, dry beans, and other crops also are grown. Irrigation water is drawn from wells from the Ogallala Formation in the eastern two-thirds of the county.

Improved plant varieties and farming methods have increased crop production and the acreage of cropland.

History

Lyle W. Stone, local historian, Flagler, Colorado, helped prepare this section.

Native Americans, such as the Arapahoe, Cheyenne, and other tribes, were sustained by countless numbers of bison roaming the prairies in the area that is now Kit Carson County.

The Spanish claimed the area by treaty in 1762. They sought treasure, especially gold, and left behind only a few artifacts. Eventually they passed the area along to the French, who sold their rights to these lands to the United States of America through the Louisiana Purchase in 1803.

The area that became Kit Carson County was Arapahoe County in the Kansas Territory. As settlers arrived, battles for land were fought with Native Americans already living in the area.

The county was named for Kit Carson, who arrived here in the early 1800's and trapped muskrat along the Republican River and traded goods with the Indians. He lived on a small knoll east of Flagler, where he established a small post. The location is now called Kit Carson Hill, or Kit Carson's Trading Post. In 1842, Kit Carson helped guide Lt. John C. Frémont through this trackless prairie on his journey to the Rocky Mountains. Frémont continued on to help conquer California during the Mexican War.

In 1859, Horace Greeley passed through this land on the Leavenworth and Pikes Peak Stage Line, which followed the Republican River in this area. After passing north of Burlington and arriving at stop 22 east of Flagler, he pronounced the land "a virtual desert that could not support people." This statement may have prompted an inscription on early maps of this area as "The Great American Desert."

In 1861, the Territory of Colorado was separated from the Kansas Territory, but the survey area remained Arapahoe County. In 1876, Colorado was admitted to the Union as the 38th state. Later that year this area became part of Elbert County, which extended from near Denver to the Kansas state line. Because large cattle ranches predominated in the area at the time, State Round-Up laws were enacted. These ranches eventually ceded lands to the homesteaders who flocked to this area.

The Chicago, Kansas, and Nebraska Railroad (later the Chicago, Rock Island, and Pacific) pushed its way through the area in 1888. New towns were established, and the foundation for the prosperity of the area was laid. In 1889, the area became Kit Carson County. The first county seat was at Concordia, just east of Stratton; however, the efforts of aggressive constituents caused it to be relocated to Burlington, where it remains today. The proposed town of Crystal Springs, just east of Flagler, also bid for the county seat.

Many farms and ranches were established in the county. In the 1930's, disaster threatened the area because the prevalent management methods exposed the soil to wind erosion. Changes in conservation methods were also prompted in 1934, when flooding devastated the area. The capture of runoff and the maintenance of crop residue by improved tillage methods now help to preserve this fragile prairie.

Physiography and Drainage

The rivers and creeks in Kit Carson County flow generally to the northeast. The South Fork of the Arikaree River and the South Fork of the Republican River and its tributaries dissect the tablelands with valleys. The Smoky Hill River generally meanders

without a distinct valley along most of its course. The extreme southwest corner of the county, adjacent to Cheyenne County, is drained by the headwaters of Big Sandy Creek, a tributary of the Arkansas River.

The land surface in the northern half and the southeastern quarter of the county, excluding the sandhills on the north, includes nearly level and gently sloping tablelands that formed in loess and fine eolian sand. In some areas the loess and the Ogallala Formation are mixed. Narrow drainageways dissect the tablelands with gently sloping to strongly sloping soils that formed in material from the Ogallala Formation or in loess in the upper part of the soil and material from the Ogallala Formation in the lower part.

The land surface north of Bethune and Stratton formed in coarse eolian sand on nearly level to steep sandhills.

The land surface in the southwest corner of the county contains less tableland and more nearly level to moderately sloping soils on plains. These soils formed in alluvium from the Ogallala Formation. Adjacent to the South Fork of the Republican River are nearly level to strongly sloping soils that formed in Pierre Shale.

Geology

The Peoria Loess, the Ogallala and Pierre Formations, and eolian sand are the parent materials of the soils in the survey area. The Ogallala and Pierre Formations are sedimentary in origin. The eolian sand is of the Holocene and Pleistocene periods (U.S. Department of the Interior, 1980).

The Peoria Loess was deposited over the Ogallala Formation and is of the Pleistocene period. Kuma-Keith silt loams, 0 to 2 percent slopes, formed in Peoria Loess.

The Ogallala Formation consists of mixed material, mainly sand and gravel, deposited above the Pierre Formation during the upper Miocene period. The Ogallala Formation provides the ground water used in the survey area (U.S. Department of the Interior, 1980).

The Pierre Formation was deposited during the upper Cretaceous period and is exposed in the southwestern part of the county. Midway-Razor clay loams, 5 to 15 percent slopes, formed in the material derived from Pierre Shale.

Eolian sand was deposited over the Ogallala Formation and Peoria Loess during the Holocene and Pleistocene periods. Valent loamy sand, 5 to 15 percent slopes, formed in this material.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Burlington, Colorado, in the period 1961 to 1990. 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 31.6 degrees F and the average daily minimum temperature is 18.7 degrees. The lowest temperature on record, which occurred on January 4,1959, is -25 degrees. In summer, the average temperature is 72.8 degrees and the average daily maximum temperature is 87.3 degrees. The highest recorded temperature, which occurred on June 15, 1952, is 112 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 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 total annual precipitation is 14.89 inches. Of this total, 10.5 inches, or about 71 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 3.51 inches on July 19, 1985. Thunderstorms occur on about 48 days each year, and most occur between May and August.

The average seasonal snowfall is 22.6 inches. The greatest snow depth at any one time during the period of record was 24 inches. On the average, 6 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 48 percent. Humidity is higher at night, and the average at dawn is about 79 percent. The sun shines 76 percent of the time possible in summer and 65 percent in winter. The prevailing wind is from the south for all months except from December to March, when it is from the north. Average windspeed is highest, around 16 miles per hour, in March and April.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and

management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; 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 in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

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

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

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

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

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. It is named for the major soils. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Nearly Level and Gently Sloping Soils That Formed in Alluvium

These soils make up about 0.5 percent of the survey area. The native vegetation is mainly grasses. Elevation is 3,740 to 4,100 feet. The average annual precipitation is about 15 to 17 inches, the average annual air temperature is 51 degrees F, and the average frost-free season is 150 days.

These soils are very deep and are well drained to poorly drained. They formed in alluvium. They are used mainly as nonirrigated and irrigated cropland or as rangeland.

1. Glenberg-Concordia-Oxyaquic Ustifluvents

Very deep, well drained, moderately well drained, and poorly drained, nearly level and gently sloping soils that formed in alluvium; on flood plains

This map unit consists of areas of flood plains along the Republican River. Slopes range from 0 to 4 percent. The natural vegetation is mainly short and mid grasses but also includes areas of rush, willow, and cottonwood on the Oxyaquic Ustifluvents.

The unit makes up about 0.5 percent of the survey area. It is about 39 percent Glenberg and similar soils, 19 percent Concordia and similar soils, 13 percent Oxyaquic Ustifluvents and similar soils, and 29 percent soils of minor extent.

The minor soils are Paoli soils on stream terraces, Satanta soils on terraces, and Bankard and Kitcarson soils on flood plains. The Paoli and Satanta soils are well drained, the Bankard soils are somewhat excessively drained, and the Kitcarson soils are somewhat poorly drained.

The very deep, well drained Glenberg soils are nearly level and gently sloping. They formed in alluvium. The surface layer is light yellowish brown fine sandy loam about 4 inches thick. The upper 9 inches of the underlying material is light yellowish brown, calcareous fine sandy loam. The lower part to a depth of 60 inches is pale brown, calcareous sandy loam and loamy sand.

The very deep, moderately well drained Concordia soils are nearly level. They formed in alluvium. The surface layer is grayish brown, calcareous loam about 2 inches thick. The upper 4 inches of the subsoil is dark grayish brown, calcareous clay. The next 32 inches is brown, pale brown, and light brownish gray, calcareous clay. The lower 9 inches is light brownish gray, calcareous clay loam. The lower part of the subsoil is pale brown and light brownish gray, calcareous silty clay to a depth of 60 inches or more.

The very deep, poorly drained Oxyaquic Ustifluvents are level. They formed in alluvium. The surface layer is brown loam about 7 inches thick. The upper part of the underlying layer is pale brown, calcareous fine sandy loam about 23 inches thick. The next layer is light gray, calcareous sand about 5 inches thick. Below this is grayish brown and dark gray, calcareous silty clay loam and silty clay about 25 inches thick. The next layer is gray, calcareous coarse sand to a depth of 62 inches or more.

Most areas of this unit are used as rangeland or nonirrigated and irrigated cropland.

The main management need in areas of rangeland is controlled livestock management.

The management concerns affecting nonirrigated and irrigated cropland are the hazard of soil blowing, lime-induced chlorosis, and flooding. Other management concerns include droughtiness on the Glenberg soils, a high content of clay and excess sodium on the Concordia soils, and wetness on the Concordia soils and the Oxyaquic Ustifluvents.

The management concerns affecting homesite development are the flooding and wetness.

Nearly Level to Moderately Steep Soils on Loessial Plains

These soils make up about 61 percent of the survey area. The native vegetation is mainly short grasses. Elevation is 3,900 to 5,200 feet. The average annual precipitation is 13 to 17 inches, the average annual air temperature is 49 to 51 degrees F, and the average frost-free season is 135 to 150 days.

These soils are very deep and well drained. They formed in loess. They are used as nonirrigated and irrigated cropland or as rangeland.

2. Weld-Colby-Norka

Very deep, well drained, nearly level and gently sloping soils that formed in loess; on plains

This map unit consists of areas in the western part of the county adjacent to Lincoln County. Slopes range from 0 to 5 percent. The natural vegetation is mainly short grasses.

The unit makes up about 9 percent of the survey area. It is about 31 percent Weld and similar soils, 30 percent Colby and similar soils, 15 percent Norka and similar soils, and 24 percent soils of minor extent.

The minor soils are Kimst and Stoneham soils on summits and side slopes, Wages soils on side slopes, Fort Collins soils on toeslopes or footslopes, and Sampson and Rago soils in narrow, intermittent drainageways.

The very deep, well drained Weld soils are on nearly level and gently sloping plains. They formed in loess. The surface layer is grayish brown silt loam about 5 inches thick. The upper part of the subsoil is dark grayish brown silty clay about 7 inches thick. The next 6 inches is grayish brown silty clay. The lower 10 inches is light brownish gray, calcareous silty clay loam. The substratum to a depth of 60 inches or more is very pale brown, calcareous silt loam.

The very deep, well drained Colby soils are on nearly level and gently sloping plains. They are on summits. They formed in loess. The surface layer is brown, calcareous silt loam about 3 inches thick. The next layer is light yellowish brown, calcareous silt loam about 5 inches thick. The underlying material to a depth of 60 inches or more is very pale brown, calcareous silt loam.

The very deep, well drained Norka soils are on nearly level and gently sloping plains. They formed in loess. The surface layer is brown silt loam about 5 inches thick. The upper 8 inches of the subsoil is dark grayish brown silty clay loam. The lower part is very pale brown, calcareous silt loam about 26 inches thick. The substratum is pale brown and very pale brown, calcareous loam to a depth of 67 inches.

Most areas of this unit are used as nonirrigated cropland. A few areas are used as irrigated cropland or as rangeland.

The management concerns affecting nonirrigated and irrigated cropland are the hazards of water erosion and soil blowing. Other management concerns are lime-induced chlorosis and the low content of organic matter in the Colby soils.

The main management need in areas of rangeland is controlled livestock management.

3. Norka-Kuma-Keith

Very deep, well drained, nearly level and gently sloping soils that formed in loess; on plains

This map unit consists of areas in the eastern part of the county. Slopes range from 0 to 3 percent. The natural vegetation is mainly short grasses.

The unit makes up about 26 percent of the survey area. It is about 41 percent Norka and similar soils, 24 percent Kuma and similar soils, 14 percent Keith and similar soils, and 21 percent soils of minor extent.

The minor soils are Richfield soils on nearly level plains, Goshen soils in poorly defined drainageways, Colby soils on summits, and Pleasant soils in depressions.

The very deep, well drained Norka soils are on nearly level and gently sloping plains. They formed in loess. The surface layer is brown silt loam about 5 inches thick. The upper 8 inches of the subsoil is dark grayish brown silty clay loam. The lower part is very pale brown, calcareous silt loam about 26 inches thick. The substratum is pale brown and very pale brown, calcareous loam to a depth of 67 inches.

The very deep, well drained Kuma soils are on nearly level and gently sloping plains. They formed in loess. The surface layer is brown silt loam about 5 inches thick. The upper 14 inches of the subsoil is brown silty clay loam. The next layer is dark grayish brown and dark gray, calcareous silty clay loam about

15 inches thick. The lower part of the subsoil is pale brown, calcareous silt loam to a depth of 61 inches or more.

The very deep, well drained Keith soils are on nearly level and gently sloping plains. They formed in loess. The surface layer is brown silt loam about 6 inches thick. The upper 11 inches of the subsoil is dark grayish brown silt loam and silty clay loam. The next layer is light brownish gray, calcareous silty clay loam about 7 inches thick. The lower part is pale brown and very pale brown, calcareous silt loam about 23 inches thick. The substratum to a depth of 60 inches or more is very pale brown, calcareous silt loam.

Most areas of this unit are used as nonirrigated and irrigated cropland. A few areas are used as rangeland.

The main management concern affecting nonirrigated and irrigated cropland is the hazard of soil blowing.

The main management need in areas of rangeland is controlled livestock management.

4. Norka-Colby-Wages

Very deep, well drained, nearly level to moderately steep soils; on hills and plains

This map unit consists of areas adjacent to major intermittent drainageways. Slopes range from 0 to 25 percent. The natural vegetation is mainly short grasses.

The unit makes up about 10 percent of the survey area. It is about 41 percent Norka and similar soils, 23 percent Colby and similar soils, 13 percent Wages and similar soils, and 23 percent soils of minor extent.

The minor soils are Sampson and Glenberg soils on flood plains, Goshen soils in intermittent drainageways, Stoneham and Kimst soils on side slopes and summits, and Satanta soils on terraces.

The very deep, well drained Norka soils are on nearly level plains to moderately sloping hills. They formed in loess. The surface layer is brown silt loam about 5 inches thick. The upper 8 inches of the subsoil is dark grayish brown silty clay loam. The lower part is very pale brown, calcareous silt loam about 26 inches thick. The substratum is pale brown and very pale brown, calcareous loam to a depth of 67 inches.

The very deep, well drained Colby soils are on nearly level plains to moderately steep hills. They are on side slopes and summits. They formed in loess. The surface layer is brown, calcareous silt loam about 3 inches thick. The next layer is light yellowish brown, calcareous silt loam about 5 inches thick. The underlying material to a depth of 60 inches or more is very pale brown, calcareous silt loam.

The very deep, well drained Wages soils are on gently sloping plains to strongly sloping hills. They are on side slopes. They formed in eolian material over alluvial material. The surface layer is grayish brown loam about 5 inches thick. The upper 7 inches of the subsoil is brown loam. The lower 5 inches is light yellowish brown, calcareous loam. The substratum to a depth of 60 inches or more is very pale brown, calcareous loam.

Most areas of this unit are used as rangeland. A few areas are used as nonirrigated cropland.

The main management need in areas of rangeland is controlled livestock management.

The management concerns affecting nonirrigated cropland are the hazards of water erosion and soil blowing and the slope. Other management concerns are lime-induced chlorosis and the low content of organic matter in the Colby soils.

5. Weld-Richfield-Colby

Very deep, well drained, nearly level and gently sloping soils that formed in loess; on plains

This map unit consists of areas near Stratton and in the northwestern part of the county. Slopes range from 0 to 5 percent. The natural vegetation is mainly short grasses.

The unit makes up about 13 percent of the survey area. It is about 38 percent Weld and similar soils, 20 percent Richfield and similar soils, 15 percent Colby and similar soils, and 27 percent soils of minor extent.

The minor soils are Wages and Norka soils on side slopes, Satanta soils on toeslopes, Iliff and Platner soils on nearly level plains, and Rago soils on nearly level plains and in drainageways.

The very deep, well drained Weld soils are on nearly level and gently sloping plains. They formed in loess. The surface layer is grayish brown silt loam about 5 inches thick. The upper part of the subsoil is dark grayish brown silty clay about 7 inches thick. The next 6 inches is grayish brown silty clay. The lower 10 inches is light brownish gray, calcareous silty clay loam. The substratum to a depth of 60 inches or more is very pale brown, calcareous silt loam.

The very deep, well drained Richfield soils are on nearly level and gently sloping plains. They formed in loess. The surface layer is brown silty clay loam about 5 inches thick. The upper 10 inches of the subsoil is dark grayish brown silty clay. The lower 12 inches of the subsoil is pale brown, calcareous silty clay loam. The upper 22 inches of the substratum is very pale

brown, calcareous silty clay loam. The lower part of the substratum to a depth of 60 inches or more is very pale brown, calcareous clay loam.

The very deep, well drained Colby soils are on nearly level and gently sloping plains. They are on summits. They formed in loess. The surface layer is brown, calcareous silt loam about 3 inches thick. The next layer is light yellowish brown, calcareous silt loam about 5 inches thick. The underlying material to a depth of 60 inches or more is very pale brown, calcareous silt loam.

Most areas of this unit are used as nonirrigated and irrigated cropland. A few areas are used as rangeland.

The management concerns affecting nonirrigated and irrigated cropland are the hazards of water erosion and soil blowing. Other management concerns are lime-induced chlorosis in the Richfield soils if they are deep plowed and lime-induced chlorosis and the low content of organic matter in the Colby soils.

The main management need in areas of rangeland is controlled livestock management.

6. Richfield

Very deep, well drained, nearly level soils that formed in loess; on plains

This map unit consists of an area north of Vona and Seibert. Slopes range from 0 to 2 percent. The natural vegetation is mainly short grasses.

The unit makes up about 3 percent of the survey area. It is about 72 percent Richfield and similar soils and 28 percent soils of minor extent.

The minor soils are Norka soils on side slopes, Colby soils on gently sloping summits on plains, Weld and Rago soils on nearly level plains, Pleasant soils in closed depressions, and Goshen soils in poorly defined, intermittent drainageways.

The very deep, well drained Richfield soils are on nearly level plains. They formed in loess. The surface layer is brown silt loam about 5 inches thick. The upper 10 inches of the subsoil is dark grayish brown silty clay loam. The lower 22 inches is pale brown and very pale brown, calcareous silty clay loam and silt loam. The substratum to a depth of 60 inches or more is very pale brown, calcareous silt loam.

Most areas of this unit are used for nonirrigated crops. A few areas are used for irrigated crops or as rangeland.

The main management concern affecting nonirrigated and irrigated crops is the hazard of soil blowing.

The main management need in areas of rangeland is controlled livestock management.

Nearly Level to Strongly Sloping Soils on Shale Plains

These soils make up about 0.9 percent of the survey area. The native vegetation is mainly short and mid grasses. Elevation is 4,800 to 5,200 feet. The average annual precipitation is 13 to 16 inches, the average annual air temperature is 49 degrees F, and the average frost-free season is 135 days.

These soils are shallow, moderately deep, and very deep and are well drained. They formed in clayey residuum derived from soft shale and alluvium. They are used as rangeland.

7. Midway-Razor-Manzanst

Shallow, moderately deep, and very deep, well drained, nearly level to strongly sloping soils; on shale bedrock-controlled landscapes

This map unit consists of areas south of Flagler and adjacent to the South Fork of the Republican River. Slopes range from 0 to 15 percent. The natural vegetation is mainly short and mid grasses.

The unit makes up about 0.9 percent of the survey area. It is about 30 percent Midway and similar soils, 24 percent Razor and similar soils, 16 percent Manzanst and similar soils, and 30 percent soils of minor extent.

The minor soils are Kimst soils on summits and side slopes; Sampson soils in narrow, intermittent drainageways; Stoneham soils on side slopes; Fort Collins soils on toeslopes and footslopes; and Canyon soils on summits and shoulders.

The shallow, well drained Midway soils are on moderately sloping and strongly sloping hills. They are on summits and side slopes. They formed in clayey residuum derived from soft shale. The surface layer is brown, calcareous clay loam about 4 inches thick. The underlying material is light yellowish brown, calcareous clay about 11 inches thick. Weathered shale is at a depth of 15 inches.

The moderately deep, well drained Razor soils are on gently sloping to strongly sloping hills. They formed in clayey residuum derived from soft shale. The surface layer is grayish brown clay loam about 4

inches thick. The upper part of the subsoil is light olive brown, calcareous clay about 6 inches thick. The lower part is light olive brown, calcareous clay to a depth of 25 inches. Weathered shale is at a depth of 25 inches.

The very deep, well drained Manzanst soils are in nearly level and gently sloping drainageways. They formed in alluvium. The surface layer is dark grayish brown, calcareous clay loam about 3 inches thick. The upper part of the subsoil is grayish brown, calcareous clay about 34 inches thick. The lower part is light brownish gray, calcareous clay to a depth of 60 inches or more.

Most areas of this unit are used as rangeland.

The main management need in areas of rangeland is controlled livestock management.

Nearly Level to Steep Soils on Sandy Plains

These soils make up about 8 percent of the survey area. The native vegetation is mainly tall and mid grasses. Elevation is 3,900 to 4,600 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 51 degrees F, and the average frost-free season is 150 days.

These soils are very deep and are well drained to excessively drained. They formed in eolian material. They are used mainly as rangeland. A few areas are used as irrigated and nonirrigated cropland.

8. Valent-Ascalon-Julesburg

Very deep, well drained to excessively drained, nearly level to steep soils; in the sandhills

This map unit consists of areas north of Stratton. Slopes range from 0 to 45 percent. The natural vegetation is mainly tall and mid grasses and sand sagebrush.

The unit makes up about 7 percent of the survey area. It is about 38 percent Valent and similar soils, 22 percent Ascalon and similar soils, 19 percent Julesburg and similar soils, and 21 percent soils of minor extent.

The minor soils are Manter soils on side slopes, Haxtun soils on nearly level plains, Vona soils on hills, Glenberg soils on flood plains, Paoli soils on terraces, and Otero soils on summits and in blowouts and eroded areas.

The very deep, excessively drained Valent soils are on gently sloping to steep sandhills. They formed in fine and medium eolian sand. The surface layer is brown loamy sand about 9 inches thick. The underlying material to a depth of 60 inches or more is brown loamy sand.

The very deep, well drained Ascalon soils are on nearly level plains to strongly sloping hills. They formed in eolian material. The surface layer is dark grayish brown sandy loam about 6 inches thick. The upper 15 inches of the subsoil is dark grayish brown and brown sandy clay loam. The lower 29 inches is very pale brown and light gray, calcareous sandy clay loam. The substratum is very pale brown, calcareous sandy loam to a depth of 60 inches or more.

The very deep, well drained Julesburg soils are on nearly level and gently sloping plains. They formed in eolian material. The surface layer is brown loamy sand about 8 inches thick. The subsoil is brown and yellowish brown sandy loam about 34 inches thick. The substratum to a depth of 60 inches or more is pale brown loamy sand.

Most areas of this unit are used as rangeland or for nonirrigated and irrigated crops.

The main management need in areas of rangeland is controlled livestock management.

The management concerns affecting nonirrigated and irrigated crops are the hazards of water erosion and soil blowing. The hazard of soil blowing is severe on the Valent and Julesburg soils. Other management concerns are droughtiness, fast intake, and the slope on the Valent soils; the slope on the Ascalon soils; and fast intake on the Julesburg soils.

9. Haxtun-Ascalon-Julesburg

Very deep, well drained, nearly level and gently sloping soils; in the sandhills

This map unit consists of areas along the periphery of the sandhills north of Vona and Stratton and adjacent to Yuma and Washington Counties. Slopes range from 0 to 6 percent. The natural vegetation is mainly tall and mid grasses and sand sagebrush.

The unit makes up about 1 percent of the survey area. It is about 42 percent Haxtun and similar soils, 22 percent Ascalon and similar soils, 22 percent Julesburg and similar soils, and 14 percent soils of minor extent.

The minor soils are Valent soils in dunes, Manter and Wages soils on side slopes, and Kimst soils on summits.

The very deep, well drained Haxtun soils are on nearly level and gently sloping plains. They formed in eolian material. The surface layer is brown loamy sand about 6 inches thick. The upper 7 inches of the subsoil is brown sandy loam. The next part of the subsoil is brown and dark grayish brown sandy clay loam about 30 inches thick. The substratum is yellowish brown and light yellowish brown, calcareous loamy sand to a depth of 61 inches or more.

The very deep, well drained Ascalon soils are on nearly level and gently sloping plains. They formed in eolian material. The surface layer is dark grayish brown sandy loam about 6 inches thick. The upper 15 inches of the subsoil is dark grayish brown and brown sandy clay loam. The lower 29 inches is very pale brown and light gray, calcareous sandy clay loam. The substratum is very pale brown, calcareous sandy loam to a depth of 60 inches or more.

The very deep, well drained Julesburg soils are on nearly level and gently sloping plains. They formed in eolian material. The surface layer is dark grayish brown sandy loam about 5 inches thick. The subsoil is grayish brown and brown sandy loam about 37 inches thick. The substratum to a depth of 60 inches or more is pale brown loamy sand.

Most areas of this unit are used for nonirrigated and irrigated crops or as rangeland.

The main management concern affecting nonirrigated and irrigated crops is the hazard of soil blowing. Fast intake is also a management concern on the Haxtun and Julesburg soils.

The main management need in areas of rangeland is controlled livestock management.

Nearly Level to Steep Soils on Loess-Mantled, Bedrock-Controlled Plains

These soils make up about 29.6 percent of the survey area. The native vegetation is mainly short grasses. A few areas have mid grasses. Elevation is 4,000 to 5,200 feet. The average annual precipitation is 13 to 17 inches, the average annual air temperature is 49 to 51 degrees F, and the average frost-free season is 135 to 150 days.

These soils are dominantly very deep, but some are shallow. The soils are well drained. They formed in alluvium, in eolian material over alluvium, and in residuum. They are used mainly as nonirrigated cropland or as rangeland. A few areas are used as irrigated cropland.

10. Platner-Ascalon

Very deep, well drained, nearly level to moderately sloping soils; on plains

This map unit consists of areas between Vona and Seibert and in the northwestern part of the county. Slopes range from 0 to 6 percent. The natural vegetation is mainly short grasses.

The unit makes up about 3 percent of the survey area. It is about 53 percent Platner and similar soils, 21 percent Ascalon and similar soils, and 26 percent soils of minor extent.

The minor soils are Wages soils on side slopes; Rago soils on nearly level plains and in drainageways; Sampson soils in narrow, intermittent drainageways; Weld soils on nearly level plains; and Pleasant soils in depressions.

The very deep, well drained Platner soils are on nearly level and gently sloping plains. They formed in alluvium. The surface layer is brown loam about 6 inches thick. The upper 14 inches of the subsoil is brown clay. The next 7 inches is very pale brown, calcareous loam. The lower 10 inches of the subsoil is very pale brown, calcareous sandy clay loam. The substratum to a depth of 60 inches or more is light yellowish brown, calcareous sandy clay loam.

The very deep, well drained Ascalon soils are on nearly level to moderately sloping plains. They formed in eolian material. The surface layer is dark grayish brown sandy loam about 6 inches thick. The upper 15 inches of the subsoil is dark grayish brown and brown sandy clay loam. The lower 29 inches is very pale brown and light gray, calcareous sandy clay loam. The substratum is very pale brown, calcareous sandy loam to a depth of 60 inches or more.

Most areas of this unit are used for nonirrigated crops or as rangeland.

The main management concern affecting nonirrigated crops is the hazard of soil blowing. Other management concerns are the hazard of water erosion on the Ascalon soils and restricted permeability on the Platner soils.

The main management need in areas of rangeland is controlled livestock management.

11. Wages-Sampson

Very deep, well drained, nearly level to moderately sloping soils; on plains

This map unit consists of areas in the northwestern part of the county. Slopes range from 0 to 6 percent. The natural vegetation is mainly short grasses.

The unit makes up about 3 percent of the survey area. It is about 61 percent Wages and similar soils, 11 percent Sampson and similar soils, and 28 percent soils of minor extent.

The minor soils are Platner soils on nearly level and gently sloping plains; Sampson soils in narrow, intermittent drainageways; Manter soils on side slopes; Colby soils on summits and side slopes; and Pleasant soils in depressions.

The very deep, well drained Wages soils are on nearly level to moderately sloping plains. They formed in eolian material over alluvial material. The surface layer is grayish brown loam about 5 inches thick. The upper 7 inches of the subsoil is brown loam. The lower 5 inches is light yellowish brown, calcareous loam. The substratum to a depth of 60 inches or more is very pale brown, calcareous loam.

The very deep, well drained Sampson soils are in nearly level, narrow, intermittent drainageways. They formed in alluvium. The surface layer is brown loam about 6 inches thick. The upper 23 inches of the subsoil is grayish brown and brown clay loam. The next 9 inches is dark gray clay loam. The lower part of the subsoil is pale brown, calcareous sandy clay loam to a depth of 60 inches or more.

Most areas of this unit are used for nonirrigated crops. A few areas are used for irrigated crops or as rangeland.

The main management concern affecting nonirrigated and irrigated crops is the hazard of soil blowing. Other management concerns are the slope and the hazard of water erosion on the Wages soils and the rare hazard of flooding on the Sampson soils.

The main management need in areas of rangeland is controlled livestock management.

12. Wages-Satanta-Kimst

Very deep, well drained, nearly level to moderately sloping soils; on plains

This map unit consists of areas in the southeastern part of the county adjacent to Cheyenne County. Slopes range from 0 to 6 percent. The natural vegetation is mainly short grasses.

The unit makes up about 3 percent of the survey area. It is about 33 percent Wages and similar soils, 25 percent Satanta and similar soils, 12 percent Kimst and similar soils, and 30 percent soils of minor extent.

The minor soils are Ascalon and Norka soils on nearly level and gently sloping plains; Sampson soils in narrow, intermittent drainageways; Iliff soils on nearly level plains; Pleasant soils in depressions; and Glenberg soils on flood plains.

The very deep, well drained Wages soils are on nearly level and gently sloping plains. They are on side slopes. They formed in eolian material over alluvial material. The surface layer is grayish brown loam about 5 inches thick. The upper 7 inches of the subsoil is brown loam. The lower 5 inches is light yellowish brown, calcareous loam. The substratum is very pale brown, calcareous loam to a depth of 60 inches or more.

The very deep, well drained Satanta soils are on nearly level and gently sloping plains. They formed in eolian material over alluvial material. The surface layer is brown loam about 4 inches thick. The upper 15 inches of the subsoil is brown clay loam. The lower 15 inches is brown and pale brown, calcareous clay loam and loam. The substratum to a depth of 60 inches or more is light yellowish brown, calcareous loam.

The very deep, well drained Kimst soils are on nearly level to moderately sloping plains. They are on summits and side slopes. They formed in eolian material over alluvial material. The surface layer is light brownish gray, calcareous sandy clay loam about 5 inches thick. The underlying material is brown, calcareous sandy clay loam about 7 inches thick. The next layer to a depth of 60 inches or more is very pale brown, calcareous sandy clay loam.

Most areas of this unit are used for nonirrigated and irrigated crops. Some areas are used as rangeland.

The main management concern affecting nonirrigated and irrigated crops is the hazard of soil blowing. Other management concerns are the hazard of water erosion, lime-induced chlorosis, and the low content of organic matter in areas of the Kimst soils.

The main management need in areas of rangeland is controlled livestock management.

13. Wages-Stoneham-Kimst

Very deep, well drained, gently sloping to strongly sloping soils; on hills and plains

This map unit consists of areas along Landsman Creek. Slopes range from 2 to 15 percent. The natural vegetation is mainly short grasses.

The unit makes up about 6 percent of the survey area. It is about 27 percent Wages and similar soils, 26 percent Stoneham and similar soils, 13 percent Kimst and similar soils, and 34 percent soils of minor extent.

The minor soils are Glenberg soils on flood plains; Canyon soils on summits and shoulders; Eckley, Ascalon, and Manter soils on side slopes; and Sampson soils in narrow, intermittent drainageways.

The very deep, well drained Wages soils are on gently sloping plains to strongly sloping hills. They are on summits and side slopes. They formed in eolian material over alluvial material. The surface layer is grayish brown loam about 5 inches thick. The upper 7 inches of the subsoil is brown loam. The lower 5 inches is light yellowish brown, calcareous loam. The substratum to a depth of 60 inches or more is very pale brown, calcareous loam.

The very deep, well drained Stoneham soils are on gently sloping plains to strongly sloping hills. They are on summits and side slopes. They formed in eolian material over alluvial material. The surface layer is brown loam about 3 inches thick. The upper 3 inches of the subsoil is grayish brown clay loam. The next 4 inches is pale brown, calcareous clay loam. The lower part of the subsoil to a depth of 60 inches or more is very pale brown, calcareous loam.

The very deep, well drained Kimst soils are on gently sloping plains to strongly sloping hills. They are on summits and side slopes. They formed in eolian material over alluvial material. The surface layer is pale brown, calcareous loam about 6 inches thick. The upper 6 inches of the underlying material is light yellowish brown, calcareous loam. The lower part to a depth of 60 inches or more is light yellowish brown, calcareous loam.

Most areas of this unit are used as rangeland.

The main management need in areas of rangeland is controlled livestock management.

14. Stoneham-Fort Collins-Nunn

Very deep, well drained, nearly level to moderately sloping soils; on hills and plains

This map unit consists of areas in the southwestern part of the county adjacent to Cheyenne County. Slopes range from 0 to 9 percent. The natural vegetation is mainly grasses.

The unit makes up about 11 percent of the survey area. It is about 30 percent Stoneham and similar soils, 25 percent Fort Collins and similar soils, 13 percent Nunn and similar soils, and 32 percent soils of minor extent.

The minor soils are Olnest, Kimst, and Colby soils on summits and side slopes; Weld soils on nearly level plains; Glenberg soils on flood plains; and Sampson soils in narrow, intermittent drainageways.

The very deep, well drained Stoneham soils are on gently sloping plains and moderately sloping hills. They are on summits and side slopes. They formed in eolian material over alluvial material. The surface layer is brown loam about 3 inches thick. The upper 3 inches of the subsoil is grayish brown clay loam. The next 4 inches is pale brown, calcareous clay loam. The lower part of the subsoil to a depth of 60 inches or more is very pale brown, calcareous loam.

The very deep, well drained Fort Collins soils are on gently sloping plains and moderately sloping hills. They are on toeslopes and footslopes. They formed in eolian material over alluvial material. The surface layer is brown loam about 9 inches thick. The upper 10 inches of the subsoil is brown loam and clay loam. The lower part of the subsoil is light yellowish brown, calcareous clay loam about 7 inches thick. The substratum to a depth of 60 inches or more is light gray, calcareous loam.

The very deep, well drained Nunn soils are on nearly level and gently sloping terraces. They formed in old alluvium from the Ogallala Formation. The surface layer is brown clay loam about 5 inches thick. The upper part of the subsoil is dark yellowish brown clay loam about 6 inches thick. The next part is very pale brown, calcareous clay loam about 6 inches thick. The lower part of the subsoil is very pale brown, calcareous sandy clay loam about 6 inches thick. The substratum to a depth of 60 inches or more is very pale brown, calcareous sandy loam.

Most areas of this unit are used for nonirrigated crops or as rangeland.

The main management concern affecting nonirrigated crops is the hazard of soil blowing. Other management concerns are the hazard of water erosion and the slope in areas of the Stoneham and Fort Collins soils.

The main management need in areas of rangeland is controlled livestock management.

15. Kimst-Ascalon-Wages

Very deep, well drained, nearly level to moderately sloping soils; on plains

This map unit consists of areas surrounding Vona and extends to Seibert. Slopes range from 0 to 6 percent. The natural vegetation is mainly short grasses. Sand sagebrush and mid grasses grow on the Ascalon soils.

The unit makes up about 3 percent of the survey area. It is about 26 percent Kimst and similar soils, 24 percent Ascalon and similar soils, 21 percent Wages and similar soils, and 29 percent soils of minor extent.

The minor soils are Sampson soils in narrow, intermittent drainageways; Glenberg soils on flood plains; Platner soils on nearly level and gently sloping plains; Manter soils on side slopes; Pleasant soils in depressions; and Canyon soils on summits and shoulders of hills.

The very deep, well drained Kimst soils are on nearly level to moderately sloping plains. They are on summits and side slopes. They formed in eolian material over alluvial material. The surface layer is pale brown, calcareous loam about 6 inches thick. The upper 6 inches of the underlying material is light yellowish brown, calcareous loam. The lower part to a depth of 60 inches is light yellowish brown, calcareous loam.

The very deep, well drained Ascalon soils are on nearly level and gently sloping plains. They formed in eolian material. The surface layer is dark grayish brown sandy loam about 6 inches thick. The upper 15 inches of the subsoil is dark grayish brown and brown sandy clay loam. The lower 29 inches is very pale brown and light gray, calcareous sandy clay loam. The substratum is very pale brown, calcareous sandy loam to a depth of 60 inches or more.

The very deep, well drained Wages soils are on nearly level to moderately sloping plains. They are on summits and side slopes. They formed in eolian material over alluvial material. The surface layer is grayish brown loam about 5 inches thick. The upper 7 inches of the subsoil is brown loam. The lower 5 inches is light yellowish brown, calcareous loam. The substratum to a depth of 60 inches or more is very pale brown, calcareous loam.

Most areas of this unit are used for nonirrigated crops or as rangeland.

The main management concern affecting nonirrigated crops is the hazard of soil blowing. Other management concerns are the hazard of water erosion on the Kimst and Wages soils and lime-induced chlorosis and the low content of organic matter in the Kimst soils.

The main management need in areas of rangeland is controlled livestock management.

16. Canyon-Manter-Ascalon

Shallow and very deep, well drained, gently sloping to steep soils; on hills

This map unit consists of areas in the northeastern part of the county adjacent to Yuma County. Slopes range from 3 to 60 percent. The natural vegetation is mainly short grasses.

The unit makes up about 0.6 percent of the survey area. It is about 31 percent Canyon and similar soils, 30 percent Manter and similar soils, 15 percent Ascalon and similar soils, and 24 percent soils of minor extent.

The minor soils are Stoneham and Vona soils on side slopes and Glenberg soils on flood plains.

The shallow, well drained Canyon soils are on gently sloping to steep hills. They are on summits and shoulders. They formed in residuum derived from weakly cemented, calcareous sandstone from the Ogallala Formation. The surface layer is brown, calcareous gravelly loam about 3 inches thick. The next layer is brown, calcareous loam about 4 inches thick. The underlying material to a depth of 10 inches is very pale brown, calcareous loam. Weakly cemented, calcareous sandstone is at a depth of 10 inches.

The very deep, well drained Manter soils are on moderately sloping and strongly sloping hills. They are on side slopes. They formed in eolian material. The surface layer is brown sandy loam about 6 inches thick. The upper part of the subsoil is brown and yellowish brown sandy loam about 34 inches thick. The lower part to a depth of 60 inches or more is light yellowish brown, calcareous sandy loam.

The very deep, well drained Ascalon soils are on moderately sloping and strongly sloping hills. They are on side slopes. They formed in eolian material. The surface layer is dark grayish brown sandy loam about 6 inches thick. The upper 15 inches of the subsoil is dark grayish brown and brown sandy clay loam. The lower 29 inches is very pale brown and light gray, calcareous sandy clay loam. The substratum is very pale brown, calcareous sandy loam to a depth of 60 inches or more.

Most areas of this unit are used as rangeland.

The main management need in areas of rangeland is controlled livestock management.

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. More information on each map unit, or soil, is given under the heading "Use and Management of the Soils."

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 "included" areas that belong to other taxonomic classes.

An identifying symbol precedes the map unit name in the soil 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, wetness, 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, Norka silt loam, 0 to 3 percent slopes, is a phase of the Norka series.

Some map units are made up of two or more major soils. These map units are called complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Kuma-Keith silt loams, 0 to 2 percent slopes, is an example.

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

Most map units include scattered small areas of soils other than those for which the map unit is named. Some of these soils have properties that differ substantially from those of the major soil or soils and thus could significantly affect use and management. These soils are identified in the map unit descriptions. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

The presence of included areas 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.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see Contents) 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.

For information on the use of these soils for nonirrigated and irrigated crops, rangeland, windbreaks and environmental plantings, and all other land uses, see the appropriate section under the heading "Use and Management of the Soils."

1—Ascalon sandy loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs dominantly in the northern part of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in eolian material. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Ascalon and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.5 inches
Typical profile:
A—0 to 6 inches; sandy loam
Bt1—6 to 10 inches; sandy clay loam
Bt2—10 to 21 inches; sandy clay loam
Bk1—21 to 37 inches; sandy clay loam
Bk2—37 to 50 inches; sandy clay loam
C—50 to 60 inches; sandy loam
Additional components:
Kimst and similar soils: 8 percent
Otero and similar soils: 7 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: This unit is used mainly as rangeland or nonirrigated cropland.

The main limitation affecting nonirrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage should be minimized. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

The Kimst and Otero soils are subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

2—Ascalon sandy loam, 3 to 5 percent slopes

Setting

Location: This map unit occurs dominantly in the northern part of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on gently sloping plains. It formed in eolian material. The native vegetation is mainly grasses.

Component Description

Ascalon and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 3 to 5 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.5 inches
Typical profile:
A—0 to 6 inches; sandy loam
Bt1—6 to 10 inches; sandy clay loam
Bt2—10 to 21 inches; sandy clay loam
Bk1—21 to 37 inches; sandy clay loam
Bk2—37 to 50 inches; sandy clay loam
C—50 to 60 inches; sandy loam
Additional components:
Haxtun and similar soils: 5 percent
Julesburg and similar soils: 5 percent
Manter and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitation affecting nonirrigated and irrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

3—Ascalon sandy loam, 5 to 9 percent slopes

Setting

Location: This map unit occurs dominantly in the northern part of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on moderately sloping hills. It formed in eolian material. The native vegetation is mainly grasses.

Component Description

Ascalon and similar soils

Percent of the map unit: 85 percent
Landform: Hills
Slope range: 5 to 9 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.5 inches
Typical profile:
A—0 to 6 inches; sandy loam
Bt1—6 to 10 inches; sandy clay loam
Bt2—10 to 21 inches; sandy clay loam
Bk1—21 to 37 inches; sandy clay loam
Bk2—37 to 50 inches; sandy clay loam
C—50 to 60 inches; sandy loam
Additional components:
Julesburg and similar soils: 5 percent
Manter and similar soils: 5 percent
Sampson and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are the hazards of soil blowing and water erosion. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Tillage should be minimized.

Controlled livestock management is the major management practice needed on this map unit. Brush management is a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

4—Ascalon fine sandy loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs in the northern part of the survey area adjacent to Washington and Yuma Counties.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in eolian material. The native vegetation is mainly grasses.

Component Description

Ascalon and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Fine sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.9 inches
Typical profile:
Ap—0 to 4 inches; fine sandy loam
BA—4 to 7 inches; fine sandy loam
Bt1—7 to 14 inches; sandy clay loam
Bt2—14 to 18 inches; sandy clay loam
Bk1—18 to 25 inches; loam
Bk2—25 to 60 inches; fine sandy loam
Additional components:
Haxtun and similar soils: 15 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitation affecting nonirrigated and irrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on this site.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

5—Ascalon loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs dominantly in the northern part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in eolian material. The native vegetation is mainly grasses.

Component Description

Ascalon and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches
Typical profile:
Ap—0 to 4 inches; loam
BA—4 to 7 inches; loam
Bt1—7 to 12 inches; sandy clay loam
Bt2—12 to 22 inches; sandy clay loam
Bk—22 to 41 inches; sandy clay loam
Ck—41 to 60 inches; sandy loam
Additional components:
Sampson and similar soils: 8 percent
Ascalon sandy loam and similar soils: 7 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing.

6—Ascalon loam, 3 to 5 percent slopes

Setting

Location: This map unit occurs in the western part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on gently sloping plains. It formed in eolian material. The native vegetation is mainly grasses.

Component Description

Ascalon and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 3 to 5 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches
Typical profile:
Ap—0 to 4 inches; loam
BA—4 to 7 inches; loam
Bt1—7 to 12 inches; sandy clay loam
Bt2—12 to 22 inches; sandy clay loam
Bk—22 to 41 inches; sandy clay loam
Ck—41 to 60 inches; sandy loam
Additional components:
Platner and similar soils: 5 percent
Sampson and similar soils: 5 percent
Wages and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation and the hazards of soil blowing and water erosion. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Tillage should be on the contour or across the slope. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Planting the trees on the contour helps to conserve moisture.

7—Ascalon loam, 5 to 15 percent slopes

Setting

Location: This map unit occurs dominantly in the western part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on moderately sloping and strongly sloping hills. It formed in eolian material. The native vegetation is mainly grasses.

Component Description

Ascalon and similar soils

Percent of the map unit: 85 percent
Landform: Hills
Slope range: 5 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches
Typical profile:
Ap—0 to 4 inches; loam
BA—4 to 7 inches; loam
Bt1—7 to 12 inches; sandy clay loam
Bt2—12 to 22 inches; sandy clay loam
Bk—22 to 41 inches; sandy clay loam
Ck—41 to 60 inches; sandy loam
Additional components:
Ascalon sandy loam and similar soils: 5 percent
Sampson and similar soils: 5 percent
Wages and similar soils: 5 percent

Management

Major uses: Rangeland

This map unit is not suited to irrigated or nonirrigated crops because of the slope.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the slope. This unit is not suited to windbreaks and environmental plantings in areas where the slope is more than 9 percent.

8—Ascalon-Eckley loams, 1 to 5 percent slopes

Setting

Location: This map unit occurs dominantly in the western part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This map unit is on nearly level and gently sloping plains. The native vegetation is mainly grasses.

Component Description

Ascalon and similar soils

Percent of the map unit: 40 percent
Landform: Plains
Slope range: 1 to 5 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.3 inches
Typical profile:
Ap—0 to 3 inches; loam
Bt1—3 to 10 inches; sandy clay loam
Bt2—10 to 15 inches; sandy clay loam
Bt3—15 to 24 inches; sandy clay loam
Bk—24 to 31 inches; sandy loam
C—31 to 60 inches; sandy loam

Eckley and similar soils

Percent of the map unit: 30 percent
Landform: Plains
Landform element: Summits
Slope range: 1 to 5 percent
Surface layer texture: Loam
Depth to restrictive feature: Strongly contrasting textural stratification at a depth of 15 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over sandy and gravelly alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.0 inches
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 12 inches; gravelly sandy clay loam
BC—12 to 15 inches; gravelly sandy loam
2C1—15 to 22 inches; gravelly sand
2C2—22 to 60 inches; gravelly sand

Additional components

Sampson and similar soils: 15 percent
Altvan and similar soils: 10 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Rangeland and nonirrigated cropland

The main limitations affecting nonirrigated crops are the hazard of soil blowing, low precipitation, and droughtiness on the Eckley soil. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Tillage should be on the contour or across the slope.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and droughtiness on the Eckley soil. Planting the trees on the contour helps to conserve moisture.

9—Ascalon-Haxtun sandy loams, 0 to 3 percent slopes

Setting

Location: This map unit occurs in the sandhills north of Stratton, Vona, and Seibert.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on nearly level and gently sloping plains. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Ascalon and similar soils

Percent of the map unit: 40 percent
Landform: Plains
Slope range: 0 to 3 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None

Available water capacity: Mainly 8.5 inches
Typical profile:
A—0 to 6 inches; sandy loam
Bt1—6 to 10 inches; sandy clay loam
Bt2—10 to 21 inches; sandy clay loam
Bk1—21 to 37 inches; sandy clay loam
Bk2—37 to 50 inches; sandy clay loam
C—50 to 60 inches; sandy loam

Haxtun and similar soils

Percent of the map unit: 35 percent
Landform: Plains
Slope range: 0 to 3 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.8 inches
Typical profile:
A—0 to 9 inches; sandy loam
BA—9 to 24 inches; sandy loam
Btb1—24 to 30 inches; sandy clay loam
Btb2—30 to 40 inches; sandy clay loam
Bkb—40 to 48 inches; sandy clay loam
BC—48 to 58 inches; sandy loam
C—58 to 72 inches; loamy sand

Additional components

Sampson and similar soils: 10 percent
Satanta and similar soils: 9 percent
Pleasant and similar soils: 5 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitation affecting nonirrigated and irrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Cultivating only in tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

10—Bayard fine sandy loam, 2 to 6 percent slopes

Setting

Location: This map unit occurs in the northeastern part of the survey area adjacent to Yuma County.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level to moderately sloping alluvial fans, typically below limestone outcrops. It formed in alluvium.

Component Description

Bayard and similar soils

Percent of the map unit: 80 percent
Landform: Alluvial fans
Slope range: 2 to 6 percent
Surface layer texture: Fine sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.9 inches
Typical profile:
A1—0 to 5 inches; fine sandy loam
A2—5 to 15 inches; fine sandy loam
Bk1—15 to 21 inches; fine sandy loam
Bk2—21 to 36 inches; fine sandy loam
C—36 to 60 inches; loamy fine sand
Additional components:
Kimst and similar soils: 5 percent
Midway and similar soils: 5 percent
Razor and similar soils: 5 percent
Rock outcrop: 5 percent

Management

Major uses: Dominantly rangeland; nonirrigated crops in a few areas

The main limitation affecting nonirrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that

includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Tillage may be restricted by the areas of rock outcrop.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

11—Beckton silt loam, 1 to 6 percent slopes

Setting

Location: This map unit occurs west of Flagler Lake.
Elevation: 4,600 to 5,000 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 148 to 150 days
Note: This very deep, well drained soil is on nearly level to moderately sloping stream terraces. Hummocks are common. This soil formed in alluvium. The native vegetation is mainly grasses.

Component Description

Beckton and similar soils

Percent of the map unit: 85 percent
Landform: Stream terraces
Slope range: 1 to 6 percent
Surface layer texture: Silt loam
Depth to restrictive feature: Natric horizon at a depth of 2 inches
Drainage class: Well drained
Parent material: Clayey alluvium
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 0.4 inch
Typical profile:
A—0 to 2 inches; silt loam
Btn1—2 to 4 inches; silty clay loam
Btn2—4 to 8 inches; silty clay
Btn3—8 to 17 inches; silty clay loam
Btn4—17 to 24 inches; silty clay loam
C—24 to 60 inches; silty clay loam
Additional components:
Arvada and similar soils: 5 percent
Oxyaquic Ustifluvents: 5 percent
Weld and similar soils: 5 percent

Management

Major uses: Rangeland

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are excess sodium, low precipitation, and the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

12—Bethune silty clay loam, 0 to 2 percent slopes

Setting

Location: This map unit occurs south of Bethune.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 148 to 150 days
Note: This moderately deep, well drained soil is on nearly level plains. It formed in loess over weakly cemented sandstone. The native vegetation is mainly grasses.

Component Description

Bethune and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 0 to 2 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: Paralithic bedrock at a depth of 20 to 40 inches
Drainage class: Well drained
Parent material: Clayey loess over calcareous sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.2 inches
Typical profile:
Ap—0 to 4 inches; silty clay loam
Bt—4 to 11 inches; silty clay

BCk—11 to 17 inches; silty clay
Ck—17 to 25 inches; gravelly clay loam
Cr—25 to 29 inches; weathered bedrock
Additional components:
Kimst and similar soils: 5 percent
Richfield and similar soils: 5 percent
Rago and similar soils: 3 percent
Canyon and similar soils: 2 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation, the depth to bedrock, tilth, and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

In this soil deep tillage may bring lime closer to the surface, resulting in lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

The Canyon soil is shallow to bedrock.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the hazard of soil blowing, the depth to bedrock, and low precipitation. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

Onsite investigation is needed before a site that is suited to buildings and septic tank absorption fields can be selected.

13—Canyon gravelly loam, 3 to 15 percent slopes

Setting

Location: This map unit occurs adjacent to major drainageways throughout the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 148 to 152 days
Note: This shallow, well drained soil is on gently sloping to strongly sloping summits, shoulders, and side slopes on hills. It formed in residuum derived dominantly from sandstone from the Ogallala Formation. The native vegetation is mainly short and mid grasses.

Component Description

Canyon and similar soils

Percent of the map unit: 80 percent
Landform: Hills
Landform element: Summits
Slope range: 3 to 15 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: Paralithic bedrock at a depth of 10 to 20 inches
Drainage class: Well drained
Parent material: Loamy, calcareous sandstone derived from residuum
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches
Typical profile:
A—0 to 3 inches; gravelly loam
AC—3 to 7 inches; loam
C—7 to 10 inches; loam
Cr—10 to 14 inches; weathered bedrock
Additional components:
Eckley and similar soils: 5 percent
Rock outcrop: 5 percent
Stoneham and similar soils: 5 percent
Wages and similar soils: 5 percent

Management

Major uses: Rangeland

This map unit is not suited to nonirrigated crops because of the hazards of water erosion and soil blowing and the depth to bedrock.

Controlled livestock management is the major management practice needed on this map unit.

This map unit is not suited to windbreaks and environmental plantings because of the depth to bedrock.

14—Canyon-Rock outcrop complex, 5 to 60 percent slopes

Setting

Location: This map unit occurs adjacent to major drainageways throughout the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on gently sloping to very steep summits, shoulders, and side slopes, and the Rock outcrop occurs as cliffs on hills. The Rock

outcrop consists of barren, exposed calcareous sandstone. The native vegetation is mainly grasses and forbs.

Component Description

Canyon and similar soils

Percent of the map unit: 40 percent
Landform: Hills
Landform element: Summits
Slope range: 5 to 60 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: Paralithic bedrock at a depth of 10 to 20 inches
Drainage class: Well drained
Parent material: Loamy, calcareous sandstone derived from residuum
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches
Typical profile:
A—0 to 3 inches; gravelly loam
AC—3 to 7 inches; loam
C—7 to 10 inches; loam
Cr—10 to 14 inches; weathered bedrock

Rock outcrop

Percent of the map unit: 30 percent
Landform: Hills
Slope range: 5 to 60 percent
Type of bedrock: Calcareous sandstone
Depth to restrictive feature: Lithic bedrock at the surface
Flooding: None

Additional components

Kimst and similar soils: 5 percent
Stoneham and similar soils: 5 percent
Wages and similar soils: 10 percent
Eckley and similar soils: 10 percent

Management

Major uses: Rangeland

This map unit is not suited to nonirrigated crops because of the slope, the hazard of water erosion, and the depth to bedrock.

Controlled livestock management is the major management practice needed on this map unit.

This map unit is not suited to windbreaks and environmental plantings because of the depth to bedrock.

15—Colby silt loam, 1 to 3 percent slopes

Setting

Location: This map unit is throughout the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Colby and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
Ap—0 to 4 inches; silt loam
C—4 to 60 inches; silt loam
Additional components:
Norka and similar soils: 7 percent
Wiley and similar soils: 6 percent
Lodgepole and similar soils: 1 percent
Pleasant and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are lime-induced chlorosis, low fertility, low organic matter content, and the hazards of soil blowing and water erosion. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow (fig. 2). Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in grain sorghum and beans. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reducs the hazards of

water erosion and soil blowing, and increases the water intake rate. If the Wiley soil is tilled deep, it is subject to lime-induced chlorosis.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are lime-induced chlorosis and the hazard of soil blowing. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

16—Colby silt loam, 3 to 5 percent slopes

Setting

Location: This map unit occurs throughout the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on gently sloping plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Colby and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 3 to 5 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland

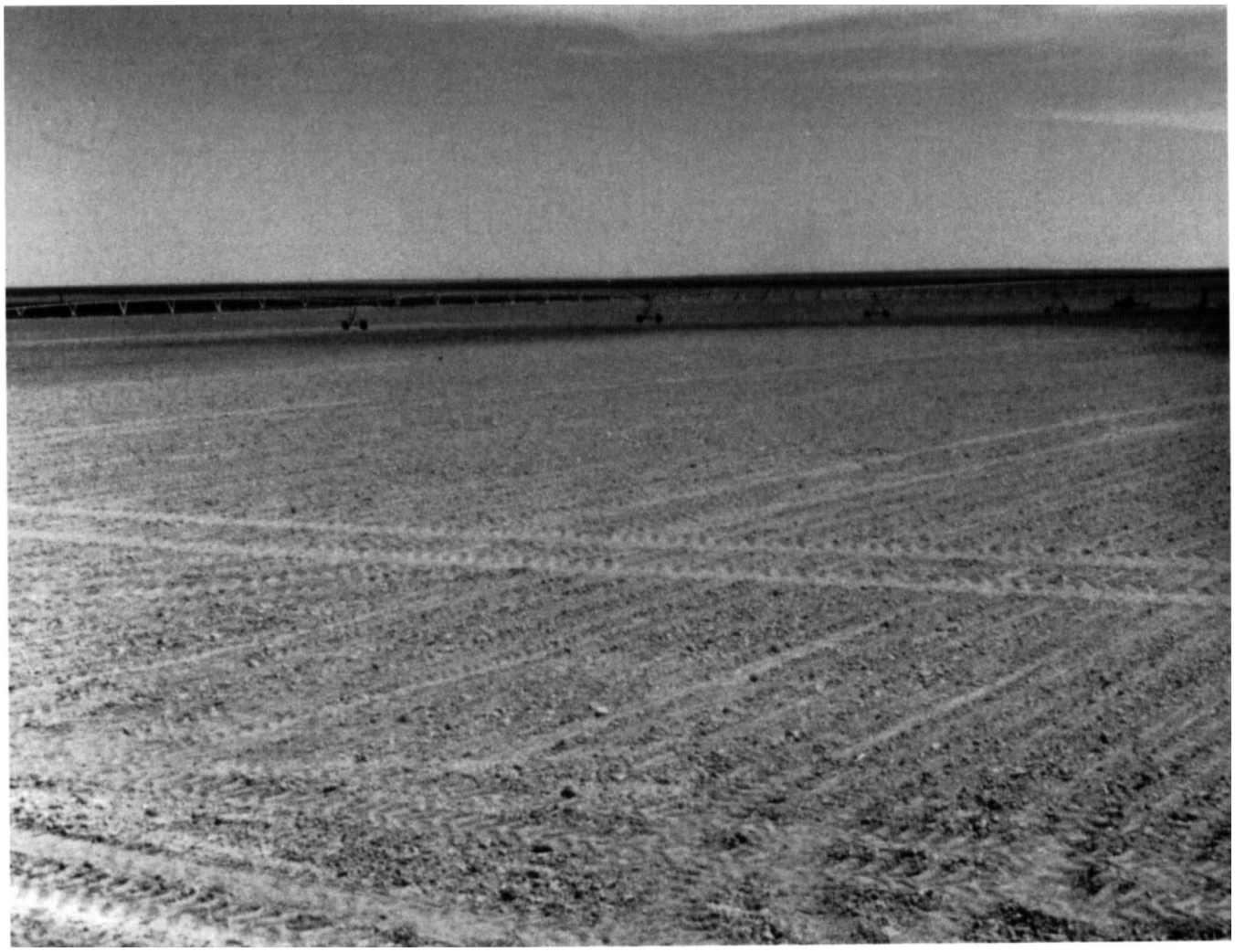

Figure 2.—Summer fallow in an area of Colby silt loam, 1 to 3 percent slopes, south of Burlington.

Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 6 inches; silt loam
AC—6 to 12 inches; silt loam
C1—12 to 30 inches; silt loam
C2—30 to 60 inches; silt loam
Additional components:
Norka and similar soils: 5 percent
Richfield and similar soils: 5 percent
Wiley and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation, low organic matter content, low fertility, lime-induced chlorosis, and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Tillage should be on the contour or across the slope. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture.

A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, lime-induced chlorosis, and the hazard of soil blowing. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

17—Colby silt loam, 5 to 15 percent slopes

Setting

Location: This map unit occurs throughout the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on moderately sloping and strongly sloping hills. It formed in loess. The native vegetation is mainly grasses.

Component Description

Colby and similar soils

Percent of the map unit: 85 percent
Landform: Hills
Slope range: 5 to 15 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 3 inches; silt loam
AC—3 to 8 inches; silt loam
C1—8 to 30 inches; silt loam
C2—30 to 60 inches; silt loam
Additional components:
Goshen and similar soils: 5 percent
Norka and similar soils: 5 percent
Wages and similar soils: 5 percent

Management

Major uses: Rangeland

This map unit is not suited to irrigated or nonirrigated crops because of the slope.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the slope, the hazard of soil blowing, and lime-induced chlorosis in the topsoil. This map unit is not suited to windbreaks and environmental plantings in areas where the slope is more than 9 percent. Planting the trees on the contour helps to conserve moisture. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

18—Colby silt loam, dry, 3 to 12 percent slopes

Setting

Location: This map unit occurs in the western part of the survey area adjacent to Lincoln County.
Elevation: 4,600 to 5,200 feet

Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on gently sloping to strongly sloping plains and hills. It formed in loess. The native vegetation is mainly grasses.

Component Description

Colby and similar soils

Percent of the map unit: 80 percent
Landform: Hills and plains
Slope range: 3 to 12 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 5 inches; silt loam
AC—5 to 16 inches; silt loam
C1—16 to 32 inches; silt loam
C2—32 to 60 inches; silt loam
Additional components:
Kimst and similar soils: 10 percent
Keith and similar soils: 5 percent
Wiley and similar soils: 5 percent

Management

Major uses: Dominantly rangeland; nonirrigated cropland in the less sloping areas

The main limitations affecting nonirrigated crops are low precipitation, low organic matter content, low fertility, slope, lime-induced chlorosis, and the hazards of soil blowing and water erosion. This map unit is suited to nonirrigated crops only in areas where the slope is less than 5 percent. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage should be on the contour or across the slope. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture. This soil is easily eroded.

The Colby, Kimst, and Wiley soils are subject to lime-induced chlorosis. A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the slope, the hazard of soil blowing, and lime-induced chlorosis. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

19—Colby silty clay loam, dry, 1 to 3 percent slopes

Setting

Location: This map unit occurs in the northwestern, central, and southern parts of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Colby and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.7 inches
Typical profile:
Ap—0 to 5 inches; silty clay loam
C1—5 to 19 inches; silt loam
C2—19 to 42 inches; silt loam
C3—42 to 62 inches; silt loam
Note: Colby silty clay loam is a remnant of an eroded soil.
Additional components:
Richfield and similar soils: 7 percent
Wiley and similar soils: 6 percent
Lodgepole and similar soils: 1 percent
Pleasant and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops

are low precipitation, lime-induced chlorosis, and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. A crust may form that reduces the rate of water infiltration on the Colby soil. Tillage during wet periods results in surface compaction and poor tilth. Deep tillage may result in lime-induced chlorosis in the Wiley soil. Returning crop residue to the soil or regularly adding other organic material improves fertility, reduces crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, the hazard of soil blowing, and lime-induced chlorosis. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

20—Colby-Aridic Ustorthents complex, 9 to 25 percent slopes, gullied

Setting

Location: This map unit occurs dominantly in the northeastern part of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on strongly sloping to moderately steep, dissected loess hills. The Colby soil is on side slopes adjacent to gullies. The Aridic Ustorthents are in the lower part of gullied areas. The native vegetation is mainly grasses.

Component Description

Colby and similar soils

Percent of the map unit: 45 percent
Landform: Hills
Slope range: 9 to 25 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 4 inches; silt loam
C1—4 to 33 inches; silt loam
C2—33 to 60 inches; silt loam

Aridic Ustorthents

Percent of the map unit: 40 percent
Landform: Hills
Landform element: Toeslopes
Slope range: 9 to 25 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Alluvium
Flooding: None
Available water capacity: Mainly 7.8 inches

Additional components

Eckley and similar soils: 5 percent
Haverson and similar soils: 5 percent
Canyon and similar soils: 3 percent
Rock outcrop: 2 percent

Management

Major uses: Rangeland

This map unit is not suited to nonirrigated crops because of the slope and the hazards of water erosion and soil blowing.

Controlled livestock management is the major management practice needed on this unit.

This map unit is not suited to windbreaks and environmental plantings because of the slope.

21—Concordia loam, 0 to 2 percent slopes, rarely flooded

Setting

Location: This map unit occurs along the Republican River north of Stratton and Bethune.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, moderately well drained soil is on flood plains. It formed in alluvium. The native vegetation is mainly grasses.

Component Description

Concordia and similar soils

Percent of the map unit: 80 percent
Landform: Flood plains

Slope range: 0 to 2 percent
Surface layer texture: Loam
Depth to restrictive feature: Natric horizon at a depth of 2 inches
Drainage class: Moderately well drained
Parent material: Clayey alluvium
Native plant cover type: Rangeland
Flooding frequency: Rare
Water table: Present within the profile
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 0.3 inch
Typical profile:
A—0 to 2 inches; loam
Btn1—2 to 6 inches; clay
Btn2—6 to 13 inches; clay
Btn3—13 to 24 inches; clay
Btkn—24 to 38 inches; clay
Btk—38 to 47 inches; clay loam
Bk1—47 to 56 inches; silty clay
Bk2—56 to 80 inches; silty clay
Additional components:
Glenberg and similar soils: 5 percent
Haverson and similar soils: 5 percent
Nunn and similar soils: 5 percent
Paoli and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Irrigated pasture and rangeland

The main limitations affecting hay and pasture are flooding, the seasonal water table, the hazard of soil blowing, and excess sodium. Grazing during wet periods results in surface compaction and poor tilth. The concentration of salts and alkali limits the production of plants that are suited to hay and pasture. The leaching of salts from the surface layer is limited by the high water table. The proper management of irrigation water reduces the concentrations of salt. Salt-tolerant species are the most suitable for planting.

Controlled livestock management is the major management practice needed on this map unit.

This map unit is not suited to windbreaks and environmental plantings because of the flooding, the excess sodium, and the wetness.

22—Eckley-Wages complex, 4 to 20 percent slopes

Setting

Location: This map unit occurs throughout the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This map unit is on gently sloping to moderately steep valley hillslopes. The native vegetation is mainly grasses.

Component Description

Eckley and similar soils

Percent of the map unit: 40 percent
Landform: Hills
Landform element: Shoulders
Slope range: 4 to 20 percent
Surface layer texture: Gravelly sandy loam
Depth to restrictive feature: Strongly contrasting textural stratification at a depth of 15 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over sandy and gravelly alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches
Typical profile:
A—0 to 4 inches; gravelly sandy loam
Bt—4 to 12 inches; gravelly sandy clay loam
BC—12 to 15 inches; gravelly sandy loam
2C1—15 to 22 inches; gravelly sand
2C2—22 to 60 inches; gravelly sand

Wages and similar soils

Percent of the map unit: 30 percent
Landform: Hills
Slope range: 4 to 12 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.8 inches
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 12 inches; loam
Bk—12 to 17 inches; loam
C—17 to 60 inches; loam

Additional components

Ascalon and similar soils: 10 percent
Altvan and similar soils: 5 percent
Manter and similar soils: 5 percent
Rock outcrop: 5 percent
Sampson and similar soils: 5 percent

Management

Major uses: Rangeland, gravel, and roadfill

This map unit is not suited to nonirrigated crops because of the slope and the hazards of water erosion and soil blowing.

Controlled livestock management is the major management practice needed on this unit.

The main limitations affecting windbreaks and environmental plantings are the slope and low precipitation. The Wages soil is also subject to the hazard of soil blowing, and the Eckley soil is droughty and has small stones. This map unit is not suited to windbreaks and environmental plantings in areas where the slope is more than 9 percent. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Planting the trees on the contour helps to conserve moisture. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

23—Fort Collins loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs in the southwestern part of the survey area adjacent to Cheyenne County, Colorado.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in eolian material over alluvium. The native vegetation is mainly grasses.

Component Description

Fort Collins and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.4 inches
Typical profile:
A—0 to 5 inches; loam
BA—5 to 9 inches; loam
Bt—9 to 19 inches; clay loam
BCk—19 to 26 inches; clay loam
Ck—26 to 60 inches; loam

Additional components:
Stoneham and similar soils: 5 percent
Ulmet and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing.

24—Glenberg sandy loam, 1 to 4 percent slopes, rarely flooded

Setting

Location: This map unit occurs in the northern part of the survey area along the Republican River.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on flood plains. It formed in sandy alluvium. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Glenberg and similar soils

Percent of the map unit: 85 percent
Landform: Flood plains
Slope range: 1 to 4 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy alluvium
Native plant cover type: Rangeland
Flooding frequency: Rare
Available water capacity: Mainly 7.1 inches
Typical profile:
A—0 to 5 inches; sandy loam
C1—5 to 9 inches; sandy loam
C2—9 to 17 inches; sandy loam
C3—17 to 28 inches; sandy loam
C4—28 to 32 inches; sandy loam

C5—32 to 60 inches; sandy loam
Additional components:
Bankard and similar soils: 5 percent
Haverson and similar soils: 5 percent
Paoli and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting irrigated and nonirrigated crops are droughtiness, the hazard of soil blowing, active channels, and lime-induced chlorosis. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Tillage should be minimized. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are droughtiness, the hazard of soil blowing, lime-induced chlorosis, and the rare flooding. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks. Dikes and channels that have floodwater outlets can protect windbreaks from flooding.

This unit is not suited to homesite development because of the flooding.

25—Glenberg, rarely flooded-Bankard, occasionally flooded, complex, 0 to 3 percent slopes

Setting

Location: This map unit occurs throughout the survey area along major drainageways.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on flood plains. It formed in alluvium. The native vegetation is mainly grasses and sagebrush.

Component Description

Glenberg and similar soils

Percent of the map unit: 50 percent
Landform: Flood plains
Slope range: 0 to 3 percent
Surface layer texture: Fine sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy alluvium
Native plant cover type: Rangeland
Flooding frequency: Rare
Available water capacity: Mainly 6.8 inches
Typical profile:
A—0 to 4 inches; fine sandy loam
AC—4 to 13 inches; fine sandy loam
C1—13 to 21 inches; sandy loam
C2—21 to 60 inches; loamy sand

Bankard and similar soils

Percent of the map unit: 30 percent
Landform: Flood plains
Slope range: 0 to 2 percent
Surface layer texture: Loamy sand
Depth to restrictive feature: More than 60 inches
Drainage class: Somewhat excessively drained
Parent material: Sandy alluvium
Native plant cover type: Rangeland
Flooding frequency: Occasional
Available water capacity: Mainly 4.1 inches
Typical profile:
A—0 to 4 inches; loamy sand
C—4 to 60 inches; sand

Additional components

Sampson and similar soils: 10 percent
Haverson and similar soils: 5 percent
Paoli and similar soils: 5 percent

Management

Major uses: Irrigated cropland and rangeland

The main limitations affecting irrigated crops are droughtiness, active channels, the hazard of soil blowing, and fast intake in the Bankard soil. Maintaining border strips and restricting the use of machinery help to stabilize banks and channels. Because of the rapid water intake rate in the Bankard soil, a sprinkler irrigation system is best suited to this unit. The location of channels may restrict irrigation methods. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating

and the leaching of plant nutrients. Tillage should be minimized. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

Controlled livestock management is needed in areas of this unit. Brush management may also be needed.

The main limitations affecting windbreaks and environmental plantings are droughtiness, the hazard of soil blowing, lime-induced chlorosis, and flooding. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks. Dikes and channels that have floodwater outlets can protect windbreaks from flooding.

This unit is not suited to homesite development because of the flooding.

26—Goshen silt loam, 0 to 2 percent slopes, rarely flooded

Setting

Location: This map unit occurs dominantly in the eastern part of the survey area but also occurs in small acreages in the western part.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is in drainageways. It formed in silty alluvium. The native vegetation is mainly grasses.

Component Description

Goshen and similar soils

Percent of the map unit: 85 percent
Landform: Drainageways
Slope range: 0 to 2 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty alluvium
Native plant cover type: Rangeland
Flooding frequency: Rare
Available water capacity: Mainly 10.6 inches
Typical profile:
A1—0 to 4 inches; silt loam
A2—4 to 19 inches; silt loam
Bt1—19 to 32 inches; silty clay loam
Bt2—32 to 45 inches; silty clay loam
Bt3—45 to 52 inches; silty clay loam
BCk—52 to 60 inches; silt loam
Additional components:
Keith and similar soils: 5 percent
Sampson and similar soils: 5 percent
Rago and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are the hazard of soil blowing and the rare flooding. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. This soil is very productive.

The main limitations affecting windbreaks and environmental plantings are the rare flooding and the hazard of soil blowing. Dikes and channels that have floodwater outlets can protect windbreaks from flooding (fig. 3).

Controlled livestock management is the major management practice needed on this map unit.

This unit is not suited to homesite development because of the flooding.

27—Haverson loam, 0 to 1 percent slopes, occasionally flooded

Setting

Location: This map unit occurs dominantly in the northern part of the survey area but also occurs adjacent to Cheyenne County, Colorado.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 145 to 152 days
Note: This very deep, well drained soil is on flood plains. It formed in mixed alluvium. The native vegetation is mainly grasses.

Component Description

Haverson and similar soils

Percent of the map unit: 80 percent
Landform: Flood plains
Slope range: 0 to 1 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches

Drainage class: Well drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Flooding frequency: Occasional
Salinity: Saline within a depth of 30 inches
Available water capacity: Mainly 9.4 inches
Typical profile:
Ap—0 to 5 inches; loam
C1—5 to 14 inches; loam
C2—14 to 60 inches; stratified loam, clay loam, and sandy loam
Additional components:
Bankard and similar soils: 10 percent
Glenberg and similar soils: 10 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation, lime-induced chlorosis, low organic matter content, the hazard of soil blowing, and the occasional flooding. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Tillage should be minimized. Returning crop residue or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Figure 3.—A grassed waterway in an area of Goshen silt loam, 0 to 2 percent slopes, rarely flooded, near the Colorado-Kansas state line.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings are the hazard of soil blowing, lime-induced chlorosis, and flooding. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks. Dikes and channels that have floodwater outlets can protect windbreaks from flooding.

This unit is not suited to homesite development because of the flooding.

28—Haxtun loamy sand, 0 to 3 percent slopes

Setting

Location: This map unit occurs in the sandhills north of Stratton and Vona.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in eolian sand. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Haxtun and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 0 to 3 percent
Surface layer texture: Loamy sand
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.5 inches
Typical profile:
A—0 to 6 inches; loamy sand
BA—6 to 13 inches; sandy loam
Bt1—13 to 18 inches; sandy clay loam
Bt2—18 to 26 inches; sandy clay loam
Btb—26 to 39 inches; sandy clay loam
BC—39 to 43 inches; sandy clay loam
C1—43 to 52 inches; loamy sand
C2—52 to 61 inches; loamy sand
Additional components:
Ascalon and similar soils: 5 percent
Manter and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are droughtiness in the topsoil and a severe hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Planting crops in alternating strips at right angles to the prevailing wind can help to control soil blowing. Because of the rapid water intake rate, a sprinkler irrigation system is best suited to this soil. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the droughtiness in the topsoil and the severe hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabricated mulches, and selection of adapted plants help to ensure the establishment and survival of seedlings.

29—Iliff silt loam, 0 to 2 percent slopes

Setting

Location: This map unit occurs south of Bethune and near Vona.
Elevation: 4,301 to 4,600 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 148 to 150 days
Note: This moderately deep, well drained soil is on nearly level plains. It formed in loess over cemented, calcareous sandstone. The native vegetation is mainly grasses.

Component Description

Iliff and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 0 to 2 percent
Surface layer texture: Silt loam

Depth to restrictive feature: Lithic bedrock at a depth of 20 to 40 inches
Drainage class: Well drained
Parent material: Clayey loess over calcareous sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.4 inches
Typical profile:
A1—0 to 6 inches; silt loam
A2—6 to 9 inches; silt loam
Bt1—9 to 15 inches; silty clay
Bt2—15 to 20 inches; silty clay loam
Bk1—20 to 25 inches; silty clay loam
Bk2—25 to 31 inches; clay loam
BCk—31 to 36 inches; clay loam
R—36 to 40 inches; unweathered bedrock
Additional components:
Bethune and similar soils: 5 percent
Canyon and similar soils: 5 percent
Rago and similar soils: 5 percent
Weld and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation, the hazard of soil blowing, and the depth to bedrock. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. A tillage pan forms easily if this soil is tilled during wet periods. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, the depth to bedrock, and the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

Onsite investigation is needed before a site that is suited to buildings and septic tank absorption fields can be selected.

30—Julesburg loamy sand, 1 to 3 percent slopes

Setting

Location: This map unit occurs north of Stratton, Vona, and Bethune in the sandhills.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in eolian sand. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Julesburg and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Loamy sand
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.4 inches
Typical profile:
Ap—0 to 8 inches; loamy sand
BA—8 to 14 inches; sandy loam
Bt—14 to 34 inches; sandy loam
BC—34 to 42 inches; sandy loam
C—42 to 62 inches; loamy sand
Additional components:
Ascalon and similar soils: 5 percent
Manter and similar soils: 5 percent
Valent and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting irrigated and nonirrigated crops are droughtiness and a severe hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Stripcropping can help to control soil blowing and conserve moisture. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush

becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are droughtiness and the severe hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

31—Julesburg loamy sand, 3 to 5 percent slopes

Setting

Location: This map unit occurs dominantly north of Stratton and Vona in the sandhills.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on gently sloping plains. It formed in eolian sand. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Julesburg and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 3 to 5 percent
Surface layer texture: Loamy sand
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.4 inches
Typical profile:
Ap—0 to 8 inches; loamy sand
BA—8 to 14 inches; sandy loam
Bt—14 to 34 inches; sandy loam
BC—34 to 42 inches; sandy loam
C—42 to 62 inches; loamy sand
Additional components:
Ascalon and similar soils: 5 percent
Manter and similar soils: 5 percent
Valent and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting irrigated and nonirrigated crops are the slope, droughtiness, a severe hazard of soil blowing, and the hazard of water erosion. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Planting crops in alternating strips at right angles to the prevailing wind can help to control soil blowing. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are droughtiness and the severe hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Planting the trees on the contour helps to conserve moisture. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

32—Julesburg sandy loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs north of Vona and Stratton in the sandhills.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in eolian sand. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Julesburg and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 1 to 3 percent

Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.7 inches
Typical profile:
A—0 to 5 inches; sandy loam
BA—5 to 12 inches; sandy loam
Bt—12 to 30 inches; sandy loam
BC—30 to 42 inches; sandy loam
C—42 to 60 inches; loamy sand
Additional components:
Haxtun and similar soils: 5 percent
Manter and similar soils: 5 percent
Valent and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting irrigated and nonirrigated crops are droughtiness and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface helps to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are droughtiness and the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

33—Julesburg sandy loam, 3 to 5 percent slopes

Setting

Location: This map unit occurs north of Seibert, Vona, and Stratton.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on gently sloping plains. It formed in eolian sand. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Julesburg and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 3 to 5 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.7 inches
Typical profile:
A—0 to 5 inches; sandy loam
BA—5 to 12 inches; sandy loam
Bt—12 to 30 inches; sandy loam
BC—30 to 42 inches; sandy loam
C—42 to 60 inches; loamy sand
Additional components:
Ascalon and similar soils: 5 percent
Haxtun and similar soils: 5 percent
Manter and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting irrigated and nonirrigated crops are the hazards of soil blowing and water erosion, droughtiness, and the slope. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Water should be applied in an amount that ensures sufficient wetness in the root zone yet minimizes the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor affecting forage production on the site.

The main limitations affecting windbreaks and environmental plantings are droughtiness and the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Planting the trees on the contour helps to conserve moisture. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

34—Julesburg-Otero complex, 1 to 9 percent slopes

Setting

Location: This map unit occurs north of Seibert, Vona, and Stratton.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on gently sloping and moderately sloping hills. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Julesburg and similar soils

Percent of the map unit: 45 percent
Landform: Hills
Slope range: 1 to 9 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.7 inches
Typical profile:
A—0 to 5 inches; sandy loam
BA—5 to 12 inches; sandy loam
Bt—12 to 30 inches; sandy loam
BC—30 to 42 inches; sandy loam
C—42 to 60 inches; loamy sand

Otero and similar soils

Percent of the map unit: 35 percent
Landform: Hills
Slope range: 1 to 9 percent
Surface layer texture: Fine sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.2 inches
Typical profile:
A—0 to 6 inches; fine sandy loam
C—6 to 60 inches; loamy very fine sand

Additional components

Ascalon and similar soils: 10 percent
Dwyer and similar soils: 5 percent
Valent and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are the hazards of soil blowing and water erosion, the slope, and droughtiness. The Otero soil is also subject to lime-induced chlorosis. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Planting crops in alternating strips at right angles to the prevailing wind can help to control soil blowing. A sprinkler system is the best method of irrigation on this map unit. Irrigation water should be applied at a rate that ensures optimum production without increasing deep percolation, runoff, and erosion.

A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients in the Otero soil. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are the hazard of soil blowing,

the slope, droughtiness on both soils, and lime-induced chlorosis in the Otero soil. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Planting the trees on the contour helps to conserve moisture. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

35—Keith silt loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs in the eastern part of the survey area adjacent to Sherman County, Kansas.
Elevation: 3,901 to 4,199 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Keith and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 6 inches; silt loam
Bt1—6 to 14 inches; silty clay loam
Bt2—14 to 20 inches; silt loam
Bk—20 to 37 inches; silt loam
C—37 to 60 inches; silt loam
Additional components:
Kuma and similar soils: 10 percent
Ulysses and similar soils: 5 percent
Goshen and similar soils: 3 percent
Pleasant and similar soils: 2 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitation affecting nonirrigated and irrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing.

36—Kimst loam, 1 to 5 percent slopes

Setting

Location: This map unit occurs dominantly in the southern part of the survey area, but a few acres occur in the northern part.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 16 inches
Frost-free period: 145 to 150 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in eolian material over alluvium. The native vegetation is mainly grasses.

Component Description

Kimst and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 1 to 5 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.5 inches
Typical profile:
A—0 to 6 inches; loam
AC—6 to 12 inches; loam
C—12 to 60 inches; loam
Additional components:
Otero and similar soils: 5 percent
Stoneham and similar soils: 5 percent
Fort Collins and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation, low organic matter content, low fertility, lime-induced chlorosis, and the hazards of soil

blowing and water erosion. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage should be minimized. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture. Terraces and contour farming can be used in areas of this soil that have smooth slopes.

A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients in the Kimst and Otero soils. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, lime-induced chlorosis, and the hazard of soil blowing. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

37—Kimst loam, 3 to 12 percent slopes

Setting

Location: This map unit occurs in the western part of the survey area adjacent to Lincoln County.
Elevation: 4,600 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 152 days
Note: This very deep, well drained soil is on gently sloping to strongly sloping hills. It formed in eolian material over alluvium. The native vegetation is mainly grasses.

Component Description

Kimst and similar soils

Percent of the map unit: 75 percent
Landform: Hills
Slope range: 3 to 12 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.5 inches
Typical profile:
Ap—0 to 5 inches; loam
AC—5 to 22 inches; sandy clay loam
C—22 to 60 inches; sandy clay loam
Additional components:
Fort Collins and similar soils: 15 percent
Olnest and similar soils: 5 percent
Vona and similar soils: 5 percent

Management

Major uses: Dominantly rangeland; nonirrigated cropland in a few of the less sloping areas

The main limitations affecting nonirrigated crops are the slope, low precipitation, low organic matter content, low fertility, lime-induced chlorosis, and the hazards of soil blowing and water erosion. This map unit is not suited to nonirrigated crops in areas where the slope is more than 5 percent. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients in the Kimst soil. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, the slope, the hazards of soil blowing and water erosion, and lime-induced chlorosis. This map unit is not suited to windbreaks and environmental plantings in areas where the slope is more than 9 percent. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

38—Kimst-Canyon loams, 2 to 5 percent slopes

Setting

Location: This map unit occurs in the southern part of the survey area adjacent to Cheyenne County, Colorado.
Elevation: 4,301 to 5,200 feet

Mean annual precipitation: 13 to 17 inches
Frost-free period: 145 to 150 days
Note: This map unit is on gently sloping plains. The Kimst soil is on side slopes. The Canyon soil is on summits. The native vegetation is mainly grasses.

Component Description

Kimst and similar soils

Percent of the map unit: 45 percent
Landform: Plains
Slope range: 2 to 5 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.5 inches
Typical profile:
A—0 to 4 inches; loam
AC—4 to 7 inches; loam
C1—7 to 30 inches; loam
C2—30 to 60 inches; sandy clay loam

Canyon and similar soils

Percent of the map unit: 25 percent
Landform: Plains
Landform element: Summits
Slope range: 2 to 5 percent
Surface layer texture: Loam
Depth to restrictive feature: Paralithic bedrock at a depth of 10 to 20 inches
Drainage class: Well drained
Parent material: Loamy, calcareous sandstone derived from residuum
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches
Typical profile:
A—0 to 3 inches; loam
AC—3 to 7 inches; gravelly loam
C—7 to 13 inches; gravelly loam
Cr—13 to 17 inches; weathered bedrock

Additional components

Satanta and similar soils: 10 percent
Stoneham and similar soils: 5 percent
Wiley and similar soils: 5 percent
Rock outcrop: 10 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are the depth to bedrock, the hazards of soil blowing and water erosion, low organic matter content, low fertility, and lime-induced chlorosis. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. If the Wiley soil is tilled deep, it is subject to lime-induced chlorosis. The Canyon soil is shallow to bedrock. Tillage may be restricted by the areas of rock outcrop.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the depth to bedrock, the hazard of soil blowing, lime-induced chlorosis, and low precipitation. Planting the trees on the contour helps to conserve moisture. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

39—Kimst-Richfield, eroded, complex, 1 to 5 percent slopes

Setting

Location: This map unit occurs south of Bethune, Stratton, and Vona.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 145 to 152 days
Note: This map unit is on nearly level and gently sloping erosional remnants of plains. A thin loess cap is over the Ogallala Formation. The native vegetation is mainly grasses.

Component Description

Kimst and similar soils

Percent of the map unit: 45 percent
Landform: Plains
Slope range: 1 to 5 percent
Surface layer texture: Clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 10.7 inches
Typical profile:
Ap—0 to 4 inches; clay loam
AC—4 to 12 inches; clay loam
C1—12 to 20 inches; clay loam
C2—20 to 41 inches; clay loam
C3—41 to 60 inches; clay loam

Richfield and similar soils

Percent of the map unit: 30 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.8 inches
Typical profile:
Ap—0 to 5 inches; silty clay loam
Bt—5 to 15 inches; silty clay
Bk—15 to 24 inches; silty clay loam
Ck1—24 to 27 inches; silty clay loam
Ck2—27 to 49 inches; silty clay loam
2C—49 to 60 inches; clay loam

Additional components

Rago and similar soils: 10 percent
Bethune and similar soils: 5 percent
Stoneham and similar soils: 5 percent
Pleasant and similar soils: 2 percent
Rock outcrop: 2 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation, the hazards of water erosion and soil blowing, and tilth on the Kimst and Richfield soils. The Kimst soil is also limited by low organic matter content, low fertility, and lime-induced chlorosis. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage may be more difficult because of the hazard of soil blowing, which results in the loss of the surface layer.

Tillage should be minimized. Minimizing tillage is critical because areas of the Kimst soil are more susceptible to soil blowing than areas of the Richfield soil. A crust that reduces the rate of water infiltration may form on the Kimst and Richfield soils. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Terraces and contour farming can be used in areas that have smooth slopes. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture. Irrigation water should be applied at a rate that ensures optimum production without increasing deep percolation, runoff, and erosion. A tillage pan forms easily if these soils are tilled during wet periods.

The Kimst soil is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate. In the Richfield and Bethune soils, deep tillage may bring the lime closer to the surface. Tillage may be restricted by the areas of rock outcrop.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, lime-induced chlorosis in the Kimst soil, and the hazard of soil blowing. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

40—Kimst-Wages sandy clay loams, 1 to 6 percent slopes

Setting

Location: This map unit occurs throughout the survey area but is dominantly in the western part.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 145 to 152 days
Note: This map unit is on nearly level and gently sloping plains. The Kimst soil is on summits, and the Wages soil is on side slopes. The native vegetation is mainly grasses.

Component Description

Kimst and similar soils

Percent of the map unit: 60 percent
Landform: Plains
Landform element: Summits
Slope range: 1 to 6 percent
Surface layer texture: Sandy clay loam

Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.5 inches
Typical profile:
Ap—0 to 5 inches; sandy clay loam
AC—5 to 12 inches; sandy clay loam
C—12 to 60 inches; sandy clay loam

Wages and similar soils

Percent of the map unit: 20 percent
Landform: Plains
Slope range: 2 to 6 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.7 inches
Typical profile:
Ap—0 to 4 inches; sandy clay loam
Bt—4 to 8 inches; sandy clay loam
Bk—8 to 13 inches; sandy clay loam
Ck—13 to 20 inches; loam
C—20 to 60 inches; sandy loam

Additional components

Manter and similar soils: 5 percent
Otero and similar soils: 5 percent
Sampson and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Rangeland and nonirrigated cropland

The main limitations affecting nonirrigated crops are low precipitation and the hazards of soil blowing and water erosion. The Kimst soil is also limited by lime-induced chlorosis, low organic matter content, and low fertility. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

The Kimst and Otero soils are subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, lime-induced chlorosis in the Kimst soil, and the hazard of soil blowing. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

41—Kitcarson loam, 0 to 2 percent slopes, rarely flooded

Setting

Location: This map unit occurs north of Stratton, Bethune, and Burlington along the Republican River.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, somewhat poorly drained soil is on flood plains. It formed in sandy alluvium. The vegetation in uncultivated areas is mainly grasses and sedge.

Component Description

Kitcarson and similar soils

Percent of the map unit: 85 percent
Landform: Flood plains
Slope range: 0 to 2 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Somewhat poorly drained
Parent material: Coarse-loamy alluvium
Native plant cover type: Rangeland
Flooding frequency: Rare
Water table: Present within the profile
Available water capacity: Mainly 8.2 inches
Typical profile:
Ap1—0 to 6 inches; loam
Ap2—6 to 15 inches; loam
C1—15 to 22 inches; loam
C2—22 to 28 inches; silt loam
C3—28 to 34 inches; clay loam
C4—34 to 46 inches; sandy loam
C5—46 to 60 inches; sand
Additional components:
Concordia and similar soils: 5 percent

Haverson and similar soils: 5 percent
Satanta and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting irrigated and nonirrigated crops are the wetness, the rare flooding, the hazard of soil blowing, and lime-induced chlorosis. The suitability of this soil for deep-rooted crops is generally limited by the buildup of the water table during the rainy period in spring.

A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the wetness, the rare flooding, the hazard of soil blowing, and lime-induced chlorosis. Dikes and channels that have floodwater outlets can protect windbreaks from flooding. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

This map unit is not suited to homesite development because of the wetness and the flooding.

42—Kuma-Keith very fine sandy loams, 1 to 3 percent slopes

Setting

Location: This map unit occurs north of Bethune adjacent to the sandhills.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on nearly level and gently sloping plains adjacent to the sandhills. The native vegetation is mainly grasses.

Component Description

Kuma and similar soils

Percent of the map unit: 45 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Very fine sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.2 inches
Typical profile:
Ap—0 to 6 inches; very fine sandy loam
BAt—6 to 15 inches; silty clay loam
Btb—15 to 23 inches; silty clay loam
Btkb—23 to 29 inches; silty clay loam
Bk1—29 to 36 inches; silt loam
Bk2—36 to 60 inches; silt loam

Keith and similar soils

Percent of the map unit: 30 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Very fine sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.4 inches
Typical profile:
Ap—0 to 9 inches; very fine sandy loam
Bt—9 to 18 inches; silty clay loam
Bk1—18 to 32 inches; silt loam
Bk2—32 to 50 inches; silt loam
C—50 to 60 inches; silt loam

Additional components

Richfield and similar soils: 10 percent
Pleasant and similar soils: 4 percent
Satanta and similar soils: 4 percent
Goshen and similar soils: 3 percent
Norka and similar soils: 3 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitation affecting irrigated and nonirrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface helps to control runoff and soil blowing and helps to maintain tilth and the content of organic

matter. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

43—Kuma-Keith silt loams, 0 to 2 percent slopes

Setting

Location: This map unit occurs dominantly in the eastern part of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on nearly level plains. The native vegetation is mainly grasses.

Component Description

Kuma and similar soils

Percent of the map unit: 45 percent
Landform: Plains
Slope range: 0 to 2 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.4 inches
Typical profile:
A—0 to 5 inches; silt loam
BAt—5 to 9 inches; silty clay loam
Bt1—9 to 16 inches; silty clay loam
Bt2—16 to 19 inches; silty clay loam
Btkb1—19 to 24 inches; silty clay loam
Btkb2—24 to 34 inches; silty clay loam
Btkb3—34 to 43 inches; silt loam
Bkb1—43 to 56 inches; silt loam
Bkb2—56 to 61 inches; silt loam

Keith and similar soils

Percent of the map unit: 30 percent
Landform: Plains
Slope range: 0 to 2 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.7 inches
Typical profile:
A—0 to 6 inches; silt loam
Bt1—6 to 9 inches; silt loam
Bt2—9 to 17 inches; silty clay loam
Btk—17 to 24 inches; silty clay loam
Bk1—24 to 34 inches; silt loam
Bk2—34 to 41 inches; silt loam
Bk3—41 to 47 inches; silt loam
C—47 to 60 inches; silt loam

Additional components

Richfield and similar soils: 10 percent
Goshen and similar soils: 5 percent
Norka and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland (fig. 4)

The main limitation affecting nonirrigated and irrigated crops is the hazard of soil blowing. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. These soils are very productive.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing.

44—Manter loamy sand, 1 to 6 percent slopes, overblown

Setting

Location: This map unit occurs north of Stratton in the sandhills.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level to moderately sloping plains. It formed in eolian material. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Manter and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 1 to 6 percent
Surface layer texture: Loamy sand
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.8 inches
Typical profile:
Ap—0 to 6 inches; loamy sand
BA—6 to 9 inches; sandy loam
Bt1—9 to 22 inches; sandy loam
Bt2—22 to 40 inches; sandy loam
Bk—40 to 60 inches; sandy loam
Additional components:
Ascalon and similar soils: 5 percent
Otero and similar soils: 5 percent
Vona and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are droughtiness, the hazard of water erosion, and a severe hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Tillage should be minimized. Planting crops in alternating strips at right angles to the prevailing wind helps to control soil blowing. The Otero soil on summits may be subject to lime-induced chlorosis.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and

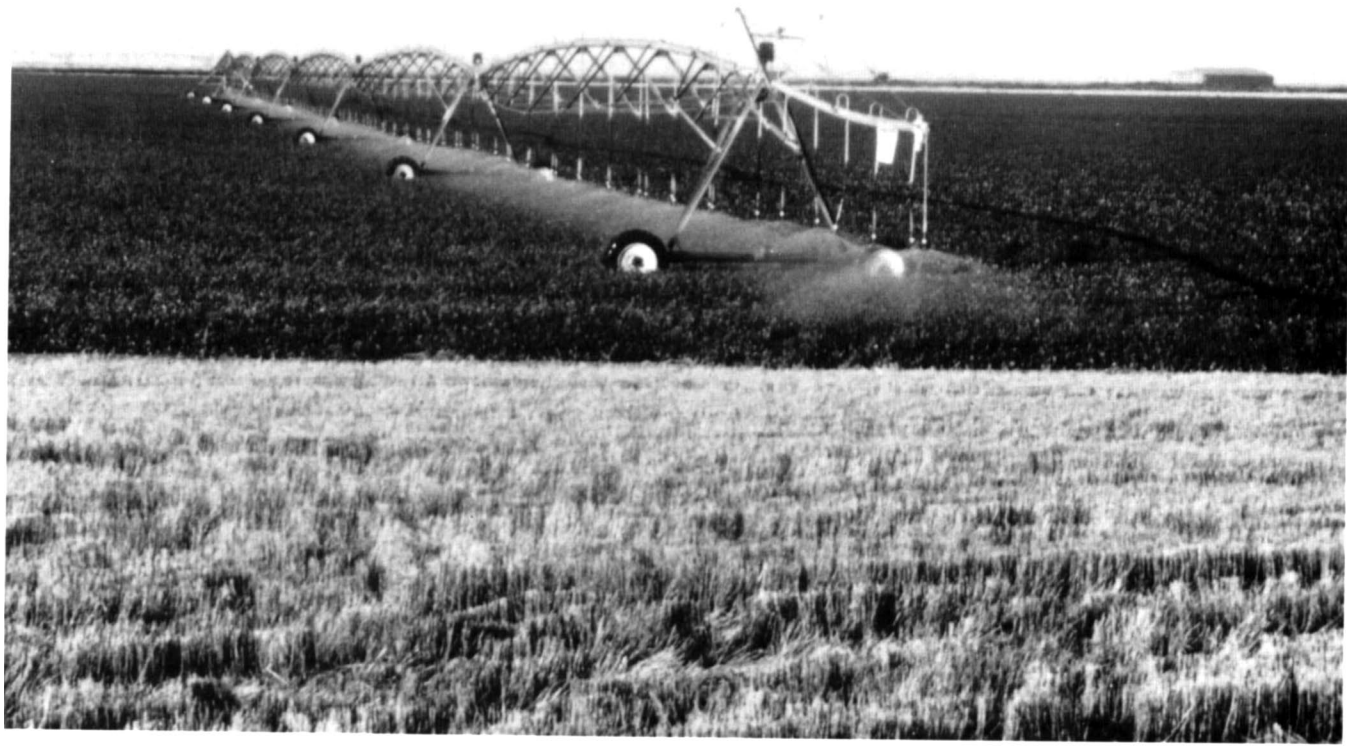

Figure 4.—Irrigated pinto beans and nonirrigated winter wheat stubble in an area of Kuma-Keith silt loams, 0 to 2 percent slopes, near Burlington.

environmental plantings are droughtiness and the severe hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Planting the trees on the contour helps to conserve moisture. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

45—Manter sandy loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs dominantly north of Stratton and Bethune.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in eolian material. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Manter and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.1 inches
Typical profile:
Ap—0 to 6 inches; sandy loam
BA—6 to 9 inches; sandy loam
Bt1—9 to 22 inches; sandy loam
Bt2—22 to 40 inches; sandy loam
Bk—40 to 60 inches; sandy loam
Additional components:
Ascalon and similar soils: 5 percent
Haxtun and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated crops are droughtiness and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Planting crops in alternating strips at right angles to the prevailing wind can help to control soil blowing. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are droughtiness and the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

46—Manter sandy loam, 3 to 5 percent slopes

Setting

Location: This map unit occurs dominantly in the northern part of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on gently sloping plains. It formed in eolian material. The native vegetation is mainly grasses. Sagebrush and yucca are common.

Component Description

Manter and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 3 to 5 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 7.1 inches
Typical profile:
Ap—0 to 6 inches; sandy loam
BA—6 to 9 inches; sandy loam
Bt1—9 to 22 inches; sandy loam
Bt2—22 to 40 inches; sandy loam
Bk—40 to 60 inches; sandy loam
Additional components:
Ascalon and similar soils: 5 percent
Haxtun and similar soils: 5 percent
Otero and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are droughtiness and the hazards of soil blowing and water erosion. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface helps to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients. The Otero soil on summits may be subject to lime-induced chlorosis.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitation affecting windbreaks and environmental plantings are droughtiness and the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Planting the trees on the contour helps to conserve moisture. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

47—Manter sandy loam, 5 to 9 percent slopes

Setting

Location: This map unit occurs north of Vona, Stratton, Bethune, and Burlington.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on moderately sloping hills. It formed in eolian material. The native vegetation is mainly grasses. Sagebrush and yucca are common.

Component Description

Manter and similar soils

Percent of the map unit: 85 percent
Landform: Hills
Slope range: 5 to 9 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.1 inches
Typical profile:
Ap—0 to 6 inches; sandy loam
BA—6 to 9 inches; sandy loam
Bt1—9 to 22 inches; sandy loam
Bt2—22 to 40 inches; sandy loam
Bk—40 to 60 inches; sandy loam
Additional components:
Ascalon and similar soils: 5 percent
Julesburg and similar soils: 5 percent
Wages and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated and irrigated crops are droughtiness, the slope, and the hazards of soil blowing and water erosion. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and

environmental plantings are the slope, droughtiness, and the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Planting the trees on the contour helps to conserve moisture. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

48—Manter-Ascalon sandy loams, 5 to 15 percent slopes

Setting

Location: This map unit occurs dominantly in the northern part of the survey area but also occurs in the southern part.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on moderately sloping and strongly sloping hills. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Manter and similar soils

Percent of the map unit: 55 percent
Landform: Hills
Slope range: 5 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.1 inches
Typical profile:
Ap—0 to 6 inches; sandy loam
BA—6 to 9 inches; sandy loam
Bt1—9 to 22 inches; sandy loam
Bt2—22 to 40 inches; sandy loam
Bk—40 to 60 inches; sandy loam

Ascalon and similar soils

Percent of the map unit: 25 percent
Landform: Hills
Slope range: 5 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.5 inches
Typical profile:
A—0 to 6 inches; sandy loam
Bt1—6 to 10 inches; sandy clay loam
Bt2—10 to 21 inches; sandy clay loam
Bk1—21 to 37 inches; sandy clay loam
Bk2—37 to 50 inches; sandy clay loam
C—50 to 60 inches; sandy loam

Additional components

Eckley and similar soils: 5 percent
Otero and similar soils: 5 percent
Stoneham and similar soils: 5 percent
Rock outcrop: 3 percent
Vona and similar soils: 2 percent

Management

Major uses: Rangeland

This map unit is not suited to nonirrigated or irrigated crops because of the slope.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

This unit is limited as a site for livestock watering ponds and other water impoundments because of the potential for seepage.

The main limitations affecting windbreaks and environmental plantings are the slope, the hazard of soil blowing, and droughtiness on the Manter soil. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Planting the trees on the contour helps to conserve moisture. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

49—Manter-Otero complex, 1 to 6 percent slopes

Setting

Location: This map unit occurs dominantly north of Vona, Stratton, and Bethune but also occurs south of Vona.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on nearly level to moderately

sloping plains. The Manter soil is on side slopes. The Otero soil is on summits. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Manter and similar soils

Percent of the map unit: 50 percent
Landform: Plains
Slope range: 1 to 6 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.1 inches
Typical profile:
Ap—0 to 6 inches; sandy loam
BA—6 to 9 inches; sandy loam
Bt1—9 to 22 inches; sandy loam
Bt2—22 to 40 inches; sandy loam
Bk—40 to 60 inches; sandy loam

Otero and similar soils

Percent of the map unit: 35 percent
Landform: Plains
Landform element: Summits
Slope range: 1 to 6 percent
Surface layer texture: Fine sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.2 inches
Typical profile:
A—0 to 6 inches; fine sandy loam
C—6 to 60 inches; fine sandy loam

Additional components

Kimst and similar soils: 5 percent
Olnest and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are droughtiness, the hazards of soil blowing and water erosion, and the slope on the Manter and Otero soils. The Otero and Kimst soils are also limited by low organic matter content, low fertility, and lime-induced chlorosis. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients in the Otero soil. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are droughtiness and the hazard of soil blowing on the Manter and Otero soils and lime-induced chlorosis on the Otero soil. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Planting the trees on the contour helps to conserve moisture. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

50—Manzanst clay loam, 1 to 3 percent slopes, rarely flooded

Setting

Location: This map unit occurs south of Flagler.
Elevation: 4,600 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is in nearly level and gently sloping drainageways. It formed in alluvium. The native vegetation is mainly grasses.

Component Description

Manzanst and similar soils

Percent of the map unit: 85 percent
Landform: Drainageways
Slope range: 1 to 3 percent
Surface layer texture: Clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey alluvium
Native plant cover type: Rangeland
Flooding frequency: Rare
Available water capacity: Mainly 10.7 inches
Typical profile:
A—0 to 3 inches; clay loam
Bt—3 to 12 inches; clay
Btk—12 to 37 inches; clay
Bk1—37 to 52 inches; clay
Bk2—52 to 60 inches; clay
Additional components:
Nunn and similar soils: 5 percent
Razor and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Rangeland

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, the rare flooding, lime-induced chlorosis, and the hazard of soil blowing. Dikes and channels that have floodwater outlets can protect windbreaks from flooding. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

This map unit is not suited to homesite development because of the flooding.

51—Midway-Razor clay loams, 5 to 15 percent slopes

Setting

Location: This map unit occurs in the southwestern part of the survey area.
Elevation: 4,600 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This map unit is on gently sloping to strongly sloping hills. The Midway soil is on summits. The Razor soil is on side slopes. The native vegetation is mainly grasses.

Component Description

Midway and similar soils

Percent of the map unit: 45 percent
Landform: Hills
Landform element: Summits
Slope range: 5 to 15 percent
Surface layer texture: Clay loam
Depth to restrictive feature: Paralithic bedrock at a depth of 6 to 20 inches
Drainage class: Well drained
Parent material: Clayey, calcareous shale derived from residuum
Native plant cover type: Rangeland
Flooding: None
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 2.4 inches
Typical profile:
A—0 to 4 inches; clay loam
C—4 to 15 inches; clay
Cr—15 to 19 inches; weathered bedrock

Razor and similar soils

Percent of the map unit: 35 percent
Landform: Hills
Slope range: 5 to 15 percent
Surface layer texture: Clay loam
Depth to restrictive feature: Paralithic bedrock at a depth of 20 to 40 inches
Drainage class: Well drained
Parent material: Clayey, calcareous shale derived from residuum
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 4.5 inches
Typical profile:
A—0 to 4 inches; clay loam
Bw—4 to 10 inches; clay
BCky—10 to 25 inches; clay
Cr—25 to 29 inches; weathered bedrock

Additional components

Stoneham and similar soils: 10 percent
Kimst and similar soils: 5 percent
Manzanst and similar soils: 5 percent

Management

Major uses: Rangeland

This map unit is not suited to nonirrigated crops because of the slope and the depth to bedrock.

Controlled livestock management is the major management practice needed on this map unit.

This map unit is not suited to windbreaks and environmental plantings because of the slope, the depth to bedrock, and excess sodium in the Midway soil. The Razor soil is suited to windbreaks and environmental plantings in areas where the slope is less than 9 percent. Onsite investigation is needed to ensure the establishment and survival of seedlings.

52—Norka silt loam, 0 to 3 percent slopes

Setting

Location: This map unit occurs dominantly in the eastern part of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Norka and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 0 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 5 inches; silt loam
Bt—5 to 13 inches; silty clay loam
Bk1—13 to 28 inches; silt loam
Bk2—28 to 39 inches; silt loam
C1—39 to 49 inches; loam
C2—49 to 67 inches; loam
Additional components:
Colby and similar soils: 5 percent
Kuma and similar soils: 4 percent
Pleasant and similar soils: 4 percent
Richfield and similar soils: 4 percent
Goshen and similar soils: 2 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitation affecting nonirrigated and irrigated crops is the hazard of soil blowing. Deep tillage may bring lime closer to the surface. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. The Colby soil is subject to lime-induced chlorosis. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing.

53—Norka silt loam, 1 to 3 percent slopes, eroded

Setting

Location: This map unit occurs dominantly in the central part of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Norka and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 5 inches; silt loam
Bt—5 to 13 inches; silty clay loam
Bk1—13 to 28 inches; silt loam
Bk2—28 to 39 inches; silt loam
C1—39 to 49 inches; loam
C2—49 to 67 inches; loam
Additional components:
Richfield and similar soils: 6 percent
Wiley and similar soils: 6 percent
Pleasant and similar soils: 4 percent
Goshen and similar soils: 3 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitation affecting nonirrigated and irrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Lime-induced chlorosis is apparent if the Norka and Wiley soils are tilled deep.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing.

54—Norka-Colby silt loams, 0 to 3 percent slopes

Setting

Location: This map unit occurs dominantly in the eastern part of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on nearly level and gently sloping plains. The native vegetation is mainly grasses.

Component Description

Norka and similar soils

Percent of the map unit: 40 percent
Landform: Plains
Slope range: 0 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 5 inches; silt loam
Bt—5 to 13 inches; silty clay loam
Bk1—13 to 28 inches; silt loam
Bk2—28 to 39 inches; silt loam
C1—39 to 49 inches; loam
C2—49 to 67 inches; loam

Colby and similar soils

Percent of the map unit: 35 percent
Landform: Plains
Slope range: 0 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
Ap—0 to 4 inches; silt loam
C—4 to 60 inches; silt loam

Additional components

Goshen and similar soils: 5 percent
Keith and similar soils: 5 percent
Kuma and similar soils: 5 percent
Richfield and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are the hazard of soil blowing on the Norka and Colby soils and lime-induced chlorosis, low organic matter content, and low fertility on the Colby soil. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Tillage should be minimized.

The Colby soil is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the hazard of soil blowing and the lime-induced chlorosis in the Colby soil. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

55—Norka-Colby silt loams, 3 to 5 percent slopes

Setting

Location: This map unit occurs dominantly in the eastern part of the survey area.
Elevation: 3,901 to 4,600 feet

Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on gently sloping plains. The Norka soil is on side slopes, and the Colby soil is on summits and side slopes. The native vegetation is mainly grasses.

Component Description

Norka and similar soils

Percent of the map unit: 50 percent
Landform: Plains
Slope range: 3 to 5 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 3 inches; silt loam
Bt—3 to 10 inches; silty clay loam
Bk—10 to 15 inches; silt loam
Ck—15 to 60 inches; silt loam

Colby and similar soils

Percent of the map unit: 35 percent
Landform: Plains
Landform element: Summits
Slope range: 3 to 5 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
Ap—0 to 4 inches; silt loam
C—4 to 60 inches; silt loam

Additional components

Goshen and similar soils: 5 percent
Richfield and similar soils: 5 percent
Kuma and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are the hazards of soil blowing and water erosion on the Norka and Colby soils and lime-induced chlorosis on the Colby soil. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Tillage should be on the contour or across the slope. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture. Because of the slope, a sprinkler system is the best method of irrigation on this unit. Irrigation water should be applied at a rate that ensures optimum production without increasing deep percolation, runoff, and erosion.

The Colby soil is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the hazard of soil blowing on all of the soils and lime-induced chlorosis on the Colby soil. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks on the Colby soil.

56—Norka-Colby silt loams, 5 to 15 percent slopes

Setting

Location: This map unit occurs dominantly in the eastern part of the survey area, but minor acreages also occur in the northwestern part.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on gently sloping to strongly sloping loess hills. The Norka soil is on side slopes, and the Colby soil is on summits and side slopes. The native vegetation is mainly grasses.

Component Description

Norka and similar soils

Percent of the map unit: 60 percent

Landform: Hills
Slope range: 5 to 9 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 7 inches; silt loam
Bt—7 to 14 inches; silt loam
Bk—14 to 18 inches; silt loam
C—18 to 60 inches; silt loam

Colby and similar soils

Percent of the map unit: 30 percent
Landform: Hills
Landform element: Summits
Slope range: 5 to 15 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
Ap—0 to 3 inches; silt loam
AC—3 to 8 inches; silt loam
C1—8 to 30 inches; silt loam
C2—30 to 60 inches; silt loam

Additional components

Goshen and similar soils: 5 percent
Kimst and similar soils: 5 percent

Management

Major uses: Rangeland

This map unit is not suited to nonirrigated crops because of the slope and the hazards of water erosion and soil blowing.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the slope, the hazard of soil blowing on all of the soils, and lime-induced chlorosis on the Colby soil. This map unit is not suited to windbreaks and environmental plantings in areas where the slope is more than 9 percent. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

57—Norka-Colby-Weld silt loams, 3 to 5 percent slopes

Setting

Location: This map unit occurs dominantly in the western part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This map unit is on gently sloping plains. The Norka soil is on side slopes, and the Colby soil is on summits and side slopes. The native vegetation is mainly grasses.

Component Description

Norka and similar soils

Percent of the map unit: 35 percent
Landform: Plains
Slope range: 3 to 5 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 3 inches; silt loam
Bt—3 to 10 inches; silty clay loam
Bk—10 to 15 inches; silt loam
Ck—15 to 60 inches; silt loam

Colby and similar soils

Percent of the map unit: 30 percent
Landform: Plains
Landform element: Summits
Slope range: 3 to 5 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
Ap—0 to 4 inches; silt loam
C—4 to 60 inches; silt loam

Weld and similar soils

Percent of the map unit: 20 percent
Landform: Plains
Slope range: 3 to 5 percent

Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.4 inches
Typical profile:
A—0 to 5 inches; silt loam
Bt1—5 to 12 inches; silty clay
Bt2—12 to 18 inches; silty clay
Bt3—18 to 28 inches; silty clay loam
C—28 to 60 inches; silt loam

Additional components

Rago and similar soils: 5 percent
Richfield and similar soils: 4 percent
Wages and similar soils: 4 percent
Lodgepole and similar soils: 1 percent
Pleasant and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation and the hazards of soil blowing and water erosion. The Colby soil is also subject to lime-induced chlorosis, low organic matter content, and low fertility. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be on the contour or across the slope. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture. Irrigation water should be applied at a rate that ensures optimum production without increasing deep percolation, runoff, and erosion.

A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, the hazard of soil blowing on all of the soils, and lime-induced chlorosis on the Colby soil. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

58—Nunn sandy clay loam, 1 to 3 percent slopes, eroded

Setting

Location: This map unit occurs dominantly in the northwestern part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 150 days
Note: This very deep, well drained soil is on nearly level and gently sloping upland terraces. It formed in old alluvium from the Ogallala Formation. The native vegetation is mainly grasses.

Component Description

Nunn and similar soils

Percent of the map unit: 80 percent
Landform: Terraces
Slope range: 1 to 3 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.5 inches
Typical profile:
Ap—0 to 8 inches; sandy clay loam
Bt1—8 to 15 inches; clay
Bt2—15 to 17 inches; clay loam
Bk—17 to 26 inches; sandy clay loam
Ck—26 to 44 inches; sandy clay loam
C—44 to 60 inches; sandy clay loam
Additional components:
Kimst and similar soils: 5 percent
Richfield and similar soils: 5 percent
Olnest and similar soils: 4 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent
Rago and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are the hazard of soil blowing, tilth, restricted permeability, and lime-induced chlorosis in severely eroded areas of this soil. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control

runoff and soil blowing and helps to maintain tilth and the content of organic matter. A tillage pan forms easily if this soil is tilled during wet periods. Chiseling or subsoiling breaks up the tillage pan. Applying irrigation water at a slow rate over a long period helps to ensure sufficient wetness in the root zone.

In the Nunn soil, deep tillage may bring the lime closer to the surface, resulting in lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis may become apparent, particularly in beans and grain sorghum. The Kimst soil also is subject to lime-induced chlorosis. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the hazard of soil blowing and lime-induced chlorosis in severely eroded areas of the Nunn soil or on the Kimst soil. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

59—Nunn clay loam, 1 to 4 percent slopes, eroded

Setting

Location: This map unit occurs dominantly south of Seibert and Vona.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level and gently sloping upland terraces. It formed in old alluvium from the Ogallala Formation. The native vegetation is mainly grasses.

Component Description

Nunn and similar soils

Percent of the map unit: 75 percent
Landform: Terraces
Slope range: 1 to 4 percent
Surface layer texture: Clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.2 inches
Typical profile:
Ap—0 to 5 inches; clay loam
Bt—5 to 11 inches; clay
Bk1—11 to 17 inches; clay loam
Bk2—17 to 23 inches; sandy clay loam
C1—23 to 50 inches; sandy loam
C2—50 to 60 inches; sandy loam
Additional components:
Kimst and similar soils: 5 percent
Sampson and similar soils: 5 percent
Ulmet and similar soils: 5 percent
Weld and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation, tilth, the hazards of soil blowing and water erosion, and restricted permeability. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Tillage should be on the contour or across the slope. A tillage pan forms easily if this soil is tilled during wet periods. Chiseling or subsoiling breaks up the tillage pan. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture. Applying irrigation water at a slow rate over a long period helps to ensure sufficient wetness in the root zone.

In the Nunn soil, deep tillage may bring the lime closer to the surface layer, resulting in lime-induced chlorosis. The Kimst soil also is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Lime-induced chlorosis may be a problem in severely eroded areas of the Nunn soil or on the Kimst soil. Planting the trees on the contour

helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

60—Olnest sandy loam, 1 to 6 percent slopes

Setting

Location: This map unit occurs dominantly in the southwestern part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level to moderately sloping plains. It formed in eolian material over mixed alluvial material derived dominantly from the Ogallala Formation. The native vegetation is mainly grasses.

Component Description

Olnest and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 1 to 6 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches
Typical profile:
A—0 to 4 inches; sandy loam
BA—4 to 7 inches; sandy loam
Bt—7 to 16 inches; sandy clay loam
Bk1—16 to 22 inches; sandy clay loam
Bk2—22 to 35 inches; sandy clay loam
Bk3—35 to 49 inches; sandy clay loam
C—49 to 60 inches; sandy loam
Additional components:
Fort Collins and similar soils: 5 percent
Otero and similar soils: 5 percent
Stoneham and similar soils: 5 percent
Manter and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation and the hazards of soil blowing and water erosion. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

61—Olnest sandy loam, 6 to 9 percent slopes

Setting

Location: This map unit occurs dominantly in the southwestern part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on moderately sloping and strongly sloping hills. It formed in eolian material over mixed alluvial material derived dominantly from the Ogallala Formation. The native vegetation is mainly grasses.

Component Description

Olnest and similar soils

Percent of the map unit: 80 percent
Landform: Hills
Slope range: 6 to 9 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches
Typical profile:
A—0 to 4 inches; sandy loam
BA—4 to 7 inches; sandy loam

Bt—7 to 16 inches; sandy clay loam
Bk1—16 to 22 inches; sandy clay loam
Bk2—22 to 35 inches; sandy clay loam
Bk3—35 to 49 inches; sandy clay loam
C—49 to 60 inches; sandy loam
Additional components:
Fort Collins and similar soils: 5 percent
Otero and similar soils: 5 percent
Stoneham and similar soils: 5 percent
Vona and similar soils: 5 percent

Management

Major uses: Rangeland

This unit is not suited to nonirrigated crops because of the slope, low precipitation, and the hazards of soil blowing and water erosion.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are low precipitation, the hazard of soil blowing, and the slope. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Planting the trees on the contour helps to conserve moisture. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

62—Olnest-Ascalon complex, 1 to 6 percent slopes

Setting

Location: This map unit occurs in the western part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This map unit is on nearly level to moderately sloping plains. The Olnest soil is on summits and side slopes, and the Ascalon soil is on side slopes. The native vegetation is mainly grasses.

Component Description

Olnest and similar soils

Percent of the map unit: 40 percent
Landform: Plains
Landform element: Summits
Slope range: 1 to 6 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches
Typical profile:
Ap—0 to 4 inches; sandy clay loam
Bt1—4 to 11 inches; sandy clay loam
Bt2—11 to 18 inches; sandy clay loam
BC—18 to 23 inches; sandy loam
Bk1—23 to 42 inches; sandy loam
Bk2—42 to 55 inches; loam
C—55 to 60 inches; sandy clay loam

Ascalon and similar soils

Percent of the map unit: 35 percent
Landform: Plains
Slope range: 1 to 6 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.5 inches
Typical profile:
A—0 to 6 inches; sandy loam
Bt1—6 to 10 inches; sandy clay loam
Bt2—10 to 21 inches; sandy clay loam
Bk1—21 to 37 inches; sandy clay loam
Bk2—37 to 50 inches; sandy clay loam
C—50 to 60 inches; sandy loam

Additional components

Kimst and similar soils: 5 percent
Platner and similar soils: 5 percent
Sampson and similar soils: 5 percent
Stoneham and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation, low organic matter content, and the hazards of soil blowing and water erosion. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage

should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

The Kimst soil is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Cultivating in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

63—Otero fine sandy loam, 1 to 20 percent slopes, moist

Setting

Location: This map unit occurs dominantly north of Seibert, Vona, and Bethune.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is in gently sloping to moderately steep blowouts. It formed in eolian sand. The native vegetation is mainly grasses, or the area is unvegetated. Sagebrush is common.

Component Description

Otero and similar soils

Percent of the map unit: 85 percent
Landform: Blowouts
Landform element: Summits
Slope range: 1 to 20 percent
Surface layer texture: Fine sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.2 inches
Typical profile:
A—0 to 6 inches; fine sandy loam
C—6 to 60 inches; loamy very fine sand
Additional components:
Dwyer and similar soils: 5 percent
Valent and similar soils: 5 percent
Kimst and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Rangeland

This map unit is not suited to nonirrigated crops because of the slope and the hazard of soil blowing.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are the hazard of soil blowing, lime-induced chlorosis, and the slope. This map unit is not suited to windbreaks and environmental plantings in areas where the slope is more than 9 percent. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

64—Otero-Olnest sandy loams, 3 to 6 percent slopes

Setting

Location: This map unit occurs in the southern part of the survey area adjacent to Cheyenne County, Colorado.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This map unit is on gently sloping and moderately sloping plains. The Otero soil is on summits, and the Olnest soil is on side slopes. Most areas are or formerly were cultivated and are severely eroded. Many eroded areas have been seeded to grass or have revegetated naturally. The native vegetation is mainly mid and short grasses.

Component Description

Otero and similar soils

Percent of the map unit: 40 percent
Landform: Plains
Landform element: Summits
Slope range: 3 to 6 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.1 inches
Typical profile:
Ap—0 to 5 inches; sandy loam
AC—5 to 18 inches; sandy loam
Ck—18 to 39 inches; sandy loam
C—39 to 60 inches; sandy loam

Olnest and similar soils

Percent of the map unit: 30 percent
Landform: Plains
Slope range: 3 to 6 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches
Typical profile:
A—0 to 4 inches; sandy loam
BA—4 to 7 inches; sandy loam
Bt—7 to 16 inches; sandy clay loam
Bk1—16 to 22 inches; sandy clay loam
Bk2—22 to 35 inches; sandy clay loam
Bk3—35 to 49 inches; sandy clay loam
C—49 to 60 inches; sandy loam

Additional components

Vona and similar soils: 10 percent
Bijou and similar soils: 10 percent
Fort Collins and similar soils: 10 percent

Management

Major uses: Dominantly rangeland; nonirrigated cropland in a few areas

The main limitations affecting nonirrigated crops are low precipitation, droughtiness, and the hazards of soil blowing and water erosion on the Olnest and Otero soils and lime-induced chlorosis, low organic matter content, and low fertility on the Otero soil. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

The Otero soil is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. The Otero soil is also subject to lime-induced chlorosis. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

65—Oxyaquic Ustifluvents, occasionally flooded

Setting

Location: This map unit occurs near Flagler and north of Bethune and Burlington along the South Fork of the Republican River.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: These very deep, poorly drained soils are on flood plains. They formed in alluvium. The native vegetation is mainly grasses, sedge, rush, willow, and cottonwood.

Component Description

Oxyaquic Ustifluvents

Percent of the map unit: 90 percent
Landform: Flood plains
Slope range: 0 to 1 percent

Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Poorly drained
Parent material: Alluvium
Native plant cover type: Rangeland
Flooding frequency: Occasional
Water table: Present within the profile
Available water capacity: Mainly 9.9 inches
Additional components:
Kitcarson and similar soils: 5 percent
Las Animas and similar soils: 5 percent

Management

Major uses: Rangeland

This map unit is not suited to nonirrigated crops because of the wetness.

Controlled livestock management is the major management practice needed on this map unit.

This map unit is not suited to windbreaks and environmental plantings because of the wetness, the flooding, the hazard of soil blowing, and lime-induced chlorosis.

This map unit is not suited to homesite development because of the flooding.

66—Paoli fine sandy loam, 0 to 2 percent slopes, rarely flooded

Setting

Location: This map unit occurs dominantly in the northern part of the survey area, but small acreages also occur in the southern part.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on stream terraces. It formed in mixed alluvium. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Paoli and similar soils

Percent of the map unit: 80 percent
Landform: Terraces
Slope range: 0 to 2 percent
Surface layer texture: Fine sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy alluvium
Native plant cover type: Rangeland
Flooding frequency: Rare
Available water capacity: Mainly 8.1 inches
Typical profile:
A1—0 to 6 inches; fine sandy loam
A2—6 to 14 inches; fine sandy loam
A3—14 to 28 inches; fine sandy loam
A4—28 to 34 inches; sandy loam
Bk1—34 to 44 inches; sandy loam
Bk2—44 to 55 inches; sandy loam
Bk3—55 to 60 inches; fine sandy loam
Additional components:
Bankard and similar soils: 5 percent
Glenberg and similar soils: 5 percent
Sampson and similar soils: 5 percent
Haverson and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are the rare flooding and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting windbreaks and environmental plantings are the rare flooding and the hazard of soil blowing. Dikes and channels that have floodwater outlets can protect windbreaks from flooding. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Planting the trees on the contour helps to conserve moisture. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

This map unit is not suited to homesite development because of the flooding.

67—Pits, gravel

Setting

Location: This map unit occurs south of Flagler, near Seibert and Bethune, and east of Burlington.
Elevation: 3,901 to 5,200 feet

Mean annual precipitation: 13 to 17 inches
Frost-free period: 145 to 152 days
Note: This map unit consists of open excavations and borrow areas from which the soil and the underlying material, most commonly gravel, have been removed. The remaining exposed material generally supports a limited amount of vegetation.

Component Description

Pits, gravel

Percent of the map unit: 100 percent
Landform: Plains
Slope range: 0 to 3 percent
Surface layer texture: Extremely gravelly sand
Depth to restrictive feature: More than 60 inches
Parent material: Alluvium
Flooding: None
Available water capacity: Mainly 1.2 inches

Management

Major uses: Gravel

Gravel pits are mainly in areas of the Ogallala Formation. These excavations generally are in areas of soils underlain by gravel at a depth of 10 to 40 inches.

Onsite investigation is required to determine the use and management in areas of this map unit. In abandoned gravel pits, reshaping the side slopes and backfilling with topsoil aid in revegetation and help to control erosion.

68—Platner loam, 0 to 3 percent slopes

Setting

Location: This map unit occurs dominantly in the northwestern part of the survey area.
Elevation: 4,301 to 5,000 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in alluvium. The native vegetation is mainly grasses.

Component Description

Platner and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 0 to 3 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.2 inches
Typical profile:
A—0 to 6 inches; loam
Bt1—6 to 11 inches; clay
Bt2—11 to 20 inches; clay
Bk1—20 to 27 inches; loam
Bk2—27 to 37 inches; sandy clay loam
C—37 to 60 inches; sandy clay loam
Additional components:
Rago and similar soils: 5 percent
Sampson and similar soils: 5 percent
Wages and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are the hazard of soil blowing and restricted permeability. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Applying irrigation water at a slow rate over a long period helps to ensure sufficient wetness in the root zone. A tillage pan may form if this soil is tilled during wet periods. Chiseling or subsoiling breaks up the tillage pan.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

69—Pleasant silty clay loam, 0 to 1 percent slopes

Setting

Location: This map unit occurs throughout the survey area.
Elevation: 3,901 to 5,200 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 145 to 152 days
Note: This very deep, moderately well drained soil is

in closed depressions. It formed in noncalcareous, fine textured alluvium derived dominantly from soils in adjacent areas. The native vegetation is mainly western wheatgrass.

Component Description

Pleasant and similar soils

Percent of the map unit: 85 percent
Landform: Depressions
Slope range: 0 to 1 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Moderately well drained
Parent material: Clayey alluvium
Native plant cover type: Rangeland
Flooding: None
Water table: Present within the profile
Ponding frequency: Occasional
Available water capacity: Mainly 10.7 inches
Typical profile:
A—0 to 5 inches; silty clay loam
BA—5 to 10 inches; silty clay
Bt—10 to 47 inches; silty clay
BC1—47 to 56 inches; silty clay
BC2—56 to 60 inches; silty clay loam
Note: The Pleasant soil in Kit Carson County is not considered a hydric soil.
Additional components:
Goshen and similar soils: 5 percent
Rago and similar soils: 5 percent
Sampson and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Rangeland and nonirrigated cropland in areas that are not ponded

The main limitations affecting nonirrigated crops are the ponding, tilth, and the hazard of soil blowing. A long period of runoff from the adjacent slopes affects plant growth. Maintaining crop residue on or near the surface can help to control soil blowing. Because of the clayey, moist soil, seedbed preparation can be difficult.

Controlled livestock management is the major management practice needed on this map unit.

This map unit is not suited to windbreaks and environmental plantings because of the ponding.

This map unit is not suited to homesite development because of the ponding.

In ponded areas this map unit provides water and food for openland wildlife, such as pheasants, ducks, rabbits, coyotes, and antelope.

70—Rago silt loam, 0 to 2 percent slopes, occasionally flooded

Setting

Location: This map unit occurs in the western and southern parts of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is in narrow drainageways. It formed in loess of two ages. The native vegetation is mainly grasses.

Component Description

Rago and similar soils

Percent of the map unit: 90 percent
Landform: Drainageways
Slope range: 0 to 2 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding frequency: Occasional
Available water capacity: Mainly 10.1 inches
Typical profile:
A—0 to 4 inches; silt loam
BA—4 to 10 inches; silt loam
Bt—10 to 24 inches; silty clay loam
Btb—24 to 40 inches; silty clay loam
Bkb—40 to 54 inches; silt loam
Bk—54 to 62 inches; silt loam
Additional components:
Weld and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation, the hazard of soil blowing, restricted permeability, and the occasional flooding. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Careful design of irrigation systems helps to overcome the restricted permeability.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the occasional flooding, low precipitation, and the hazard of soil blowing. Dikes and channels that have floodwater outlets can protect windbreaks from flooding.

This map unit is not suited to homesite development because of the flooding.

71—Rago-Weld silt loams, 0 to 2 percent slopes

Setting

Location: This map unit occurs in the central and northwestern parts of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This map unit is on nearly level plains. The native vegetation is mainly grasses.

Component Description

Rago and similar soils

Percent of the map unit: 55 percent
Landform: Plains
Slope range: 0 to 2 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.4 inches
Typical profile:
A—0 to 4 inches; silt loam
Bt—4 to 22 inches; silty clay loam
Btk—22 to 32 inches; silty clay loam
Btkb1—32 to 48 inches; silty clay loam
Btkb2—48 to 50 inches; silty clay loam
Bkb—50 to 70 inches; silt loam

Weld and similar soils

Percent of the map unit: 30 percent
Landform: Plains
Landform element: Summits
Slope range: 0 to 2 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.4 inches
Typical profile:
A—0 to 5 inches; silt loam
Bt1—5 to 12 inches; silty clay
Bt2—12 to 18 inches; silty clay
Bt3—18 to 28 inches; silty clay loam
C—28 to 60 inches; silt loam

Additional components

Norka and similar soils: 5 percent
Rago, occasionally flooded, soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Irrigated cropland, nonirrigated cropland, and rangeland

The main limitation affecting irrigated and nonirrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Carefully designed irrigation systems help to overcome the restricted permeability. These soils are very productive.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

72—Richfield silt loam, 0 to 2 percent slopes

Setting

Location: This map unit occurs dominantly in the eastern part of the survey area and north of Seibert and Vona.
Elevation: 3,901 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Richfield and similar soils

Percent of the map unit: 85 percent

Landform: Plains
Slope range: 0 to 2 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.9 inches
Typical profile:
Ap—0 to 5 inches; silt loam
Bt—5 to 15 inches; silty clay loam
Bk1—15 to 23 inches; silty clay loam
Bk2—23 to 37 inches; silt loam
C—37 to 60 inches; silt loam
Additional components:
Norka and similar soils: 10 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitation affecting nonirrigated and irrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. This soil is very productive.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

73—Richfield silty clay loam, 0 to 2 percent slopes

Setting

Location: This map unit occurs in the northwestern part of the survey area.
Elevation: 4,501 to 5,000 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Richfield and similar soils

Percent of the map unit: 85 percent
Landform: Plains
Slope range: 0 to 2 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.8 inches
Typical profile:
Ap—0 to 7 inches; silty clay loam
Bt—7 to 15 inches; silty clay
Btk—15 to 21 inches; silty clay loam
Bk—21 to 27 inches; silty clay loam
C—27 to 60 inches; silt loam
Additional components:
Rago and similar soils: 10 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Irrigated cropland, nonirrigated cropland, and rangeland

The main limitation affecting irrigated and nonirrigated crops is a tillage pan that forms easily if this soil is tilled during wet periods. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Chiseling or subsoiling breaks up the tillage pan. A crust that reduces the rate of water infiltration can form on the Richfield soil. Returning crop residue to the soil minimizes crusting, reduces the hazard of water erosion, and increases the water intake rate. This soil is very productive.

Controlled livestock management is the major management practice needed on this map unit.

No limitations affect windbreaks and environmental plantings.

74—Richfield silty clay loam, dry, 0 to 2 percent slopes, eroded

Setting

Location: This map unit occurs dominantly in the central and western parts of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches

Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Richfield and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 0 to 2 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.8 inches
Typical profile:
Ap—0 to 5 inches; silty clay loam
Bt—5 to 15 inches; silty clay
Bk—15 to 24 inches; silty clay loam
Ck1—24 to 27 inches; silty clay loam
Ck2—27 to 49 inches; silty clay loam
2C—49 to 60 inches; clay loam
Additional components:
Colby and similar soils: 5 percent
Norka and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Wiley and similar soils: 3 percent
Weld and similar soils: 2 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation and tilth. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. A crust that reduces the rate of water infiltration can form on the Richfield soil. A tillage pan forms easily if this soil is tilled during wet periods. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazard of water erosion, and increases the water intake rate.

In the Richfield and Wiley soils, deep tillage may bring the lime closer to the surface, resulting in lime-induced chlorosis. The Colby soil also is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum.

Because of the restricted permeability, the application of water should be regulated so that water does not stand on the surface and damage the crops.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is low precipitation. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

75—Sampson loam, 0 to 2 percent slopes, rarely flooded

Setting

Location: This map unit is dominantly in the western part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is in narrow, intermittent drainageways. It formed in alluvium. The native vegetation is mainly grasses.

Component Description

Sampson and similar soils

Percent of the map unit: 85 percent
Landform: Drainageways
Slope range: 0 to 2 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Flooding frequency: Rare
Available water capacity: Mainly 9.9 inches
Typical profile:
A—0 to 6 inches; loam
BA—6 to 10 inches; clay loam
Bt1—10 to 20 inches; clay loam
Bt2—20 to 29 inches; clay loam
Bt3—29 to 38 inches; clay loam
BC—38 to 60 inches; sandy clay loam
Additional components:
Glenberg and similar soils: 5 percent
Satanta and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated crops

are the flooding, low precipitation, active channels, and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter. Maintaining border strips and restricting the use of machinery help to stabilize banks and channels.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, the flooding, and the hazard of soil blowing. Dikes and channels that have floodwater outlets can protect windbreaks from flooding. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

This map unit is not suited to homesite development because of the flooding.

76—Satanta loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs dominantly in the southern part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level and gently sloping terraces. It formed in eolian material over alluvium. The native vegetation is mainly grasses.

Component Description

Satanta and similar soils

Percent of the map unit: 80 percent
Landform: Terraces
Slope range: 1 to 3 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.0 inches
Typical profile:
Ap—0 to 4 inches; loam
AB—4 to 7 inches; clay loam
Bt1—7 to 14 inches; clay loam
Bt2—14 to 19 inches; clay loam
Bt3—19 to 23 inches; clay loam
Bk—23 to 34 inches; loam
C—34 to 60 inches; loam
Additional components:
Ascalon and similar soils: 5 percent
Sampson and similar soils: 5 percent
Wages and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated crops are low precipitation and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

77—Satanta-Colby complex, 3 to 5 percent slopes

Setting

Location: This map unit occurs in the southern part of the survey area adjacent to Cheyenne County, Colorado.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 150 days
Note: This map unit is on gently sloping plains. The Satanta soil is on side slopes, and the Colby soil is on summits. The native vegetation is mainly grasses.

Component Description

Satanta and similar soils

Percent of the map unit: 50 percent
Landform: Plains
Slope range: 3 to 5 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained

Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.7 inches
Typical profile:
A1—0 to 5 inches; loam
A2—5 to 8 inches; loam
Bt—8 to 16 inches; clay loam
Bk1—16 to 21 inches; loam
Bk2—21 to 28 inches; loam
C—28 to 60 inches; loam

Colby and similar soils

Percent of the map unit: 20 percent
Landform: Plains
Landform element: Summits
Slope range: 3 to 5 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 3 inches; silt loam
AC—3 to 12 inches; silt loam
C1—12 to 28 inches; silt loam
C2—28 to 60 inches; silt loam

Additional components

Manter and similar soils: 15 percent
Sampson and similar soils: 15 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation and the hazards of water erosion and soil blowing. The Colby soil is also limited by low organic matter content, low fertility, and lime-induced chlorosis. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing. Tillage should be minimized and should be on the contour or across the slope. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture.

A high content of lime that causes lime-induced chlorosis decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing on the Satanta and Colby soils and lime-induced chlorosis on the Colby soil. Planting the trees on the contour helps to conserve moisture. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks on the Colby soil.

78—Satanta-Sampson, rarely flooded, loams, 0 to 3 percent slopes

Setting

Location: This map unit occurs throughout the survey area.
Elevation: 3,901 to 5,200 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 145 to 152 days
Note: This map unit is in nearly level and gently sloping areas on stream terraces and flood plains. The native vegetation is mainly grasses.

Component Description

Satanta and similar soils

Percent of the map unit: 40 percent
Landform: Terraces
Slope range: 0 to 3 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.0 inches
Typical profile:
Ap—0 to 4 inches; loam
AB—4 to 7 inches; clay loam
Bt1—7 to 14 inches; clay loam
Bt2—14 to 19 inches; clay loam
Bt3—19 to 23 inches; clay loam
Bk—23 to 34 inches; loam
C—34 to 60 inches; loam

Sampson and similar soils

Percent of the map unit: 30 percent
Landform: Flood plains
Slope range: 0 to 2 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Flooding frequency: Rare
Available water capacity: Mainly 9.9 inches
Typical profile:
A—0 to 6 inches; loam
BA—6 to 10 inches; clay loam
Bt1—10 to 20 inches; clay loam
Bt2—20 to 29 inches; clay loam
Bt3—29 to 38 inches; clay loam
BC—38 to 60 inches; sandy clay loam

Additional components

Paoli and similar soils: 10 percent
Bankard and similar soils: 5 percent
Glenberg and similar soils: 5 percent
Haverson and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation, the flooding on the Sampson soil, and the hazard of soil blowing. Also, the location of channels may restrict irrigation methods. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface can help to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

The Haverson soil is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans or grain sorghum.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, the hazard of soil blowing, and the flooding on the Sampson soil. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings. Dikes and channels that have floodwater outlets can protect windbreaks from flooding.

This map unit is not suited to homesite development because of the flooding.

79—Satanta-Ulmet loams, 1 to 3 percent slopes

Setting

Location: This map unit occurs dominantly in the southwestern part of the survey area and near Flagler, Seibert, and Vona.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This map unit is on nearly level and gently sloping plains. The native vegetation is mainly grasses.

Component Description

Satanta and similar soils

Percent of the map unit: 45 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.0 inches
Typical profile:
Ap—0 to 4 inches; loam
AB—4 to 7 inches; clay loam
Bt1—7 to 14 inches; clay loam
Bt2—14 to 19 inches; clay loam
Bt3—19 to 23 inches; clay loam
Bk—23 to 34 inches; loam
C—34 to 60 inches; loam

Ulmet and similar soils

Percent of the map unit: 30 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey alluvium
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 4 inches; loam
BAt—4 to 7 inches; clay loam
Bt1—7 to 12 inches; clay loam
Bt2—12 to 17 inches; clay
Bk1—17 to 26 inches; clay loam
Bk2—26 to 37 inches; clay loam
Bk3—37 to 60 inches; clay loam

Additional components

Sampson and similar soils: 10 percent
Nunn and similar soils: 5 percent
Stoneham and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. A tillage pan forms easily if the Nunn soil is tilled during wet periods.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

80—Stoneham loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs in the southwestern part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in eolian material over alluvium. The native vegetation is mainly grasses.

Component Description

Stoneham and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 6 inches; clay loam
Btk—6 to 10 inches; clay loam
Bk1—10 to 27 inches; loam
Bk2—27 to 60 inches; loam
Additional components:
Fort Collins and similar soils: 5 percent
Kimst and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Ulmet and similar soils: 3 percent
Olnest and similar soils: 2 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation and the hazard of soil blowing. In the Stoneham soil, deep tillage may bring lime closer to the surface, resulting in lime-induced chlorosis. Tillage should be minimized. A high content of lime decreases the available supply of most plant nutrients. Chlorosis may become apparent, particularly in beans and grain sorghum. The Kimst soil is already subject to lime-induced chlorosis. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Summer fallow, chemical fallow, fabric mulch for weed control, and selection of

adapted plants help to ensure the establishment and survival of seedlings.

81—Stoneham-Fort Collins loams, 3 to 5 percent slopes

Setting

Location: This map unit occurs dominantly in the southwestern part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 16 inches
Frost-free period: 145 to 148 days
Note: This map unit is on gently sloping plains. The Stoneham soil is on summits and side slopes. The Fort Collins soil is on toeslopes and footslopes. The native vegetation is mainly grasses.

Component Description

Stoneham and similar soils

Percent of the map unit: 50 percent
Landform: Plains
Landform element: Summits
Slope range: 3 to 5 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 6 inches; clay loam
Btk—6 to 10 inches; clay loam
Bk1—10 to 27 inches; loam
Bk2—27 to 60 inches; loam

Fort Collins and similar soils

Percent of the map unit: 30 percent
Landform: Plains
Landform element: Toeslopes, footslopes
Slope range: 3 to 5 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.4 inches
Typical profile:
A—0 to 5 inches; loam
BA—5 to 9 inches; loam
Bt—9 to 19 inches; clay loam
BCk—19 to 26 inches; clay loam
Ck—26 to 60 inches; loam

Additional components

Kimst and similar soils: 5 percent
Olnest and similar soils: 5 percent
Sampson and similar soils: 5 percent
Ulmet and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation, low organic matter content, and the hazards of water erosion and soil blowing. The Kimst soil is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. If the Stoneham soil is tilled deep, it is subject to lime-induced chlorosis. Returning crop residue to the soil or regularly adding other organic material improves fertility, reduces the hazard of soil blowing, and increases the water intake rate. Areas of the Stoneham and Kimst soils are more susceptible to soil blowing than areas of the Fort Collins soil. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized and should be on the contour or across the slope. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Planting the trees on the contour helps to conserve moisture. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

82—Stoneham-Kimst-Fort Collins loams, 5 to 15 percent slopes

Setting

Location: This map unit occurs dominantly in the southwestern part of the survey area and is also adjacent to major drainageways.

Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 16 inches
Frost-free period: 145 to 148 days
Note: This map unit is on moderately sloping and strongly sloping hills. The Stoneham soil is on side slopes. The Kimst soil is on summits and shoulders. The Fort Collins soil is on toeslopes and footslopes. The native vegetation is mainly grasses.

Component Description

Stoneham and similar soils

Percent of the map unit: 40 percent
Landform: Hills
Slope range: 5 to 9 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 6 inches; clay loam
Btk—6 to 10 inches; clay loam
Bk1—10 to 27 inches; loam
Bk2—27 to 60 inches; loam

Kimst and similar soils

Percent of the map unit: 20 percent
Landform: Hills
Landform element: Summits, shoulders
Slope range: 5 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.5 inches
Typical profile:
A—0 to 6 inches; loam
AC—6 to 12 inches; loam
C—12 to 60 inches; loam

Fort Collins and similar soils

Percent of the map unit: 20 percent
Landform: Hills
Landform element: Toeslopes, footslopes
Slope range: 5 to 9 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.4 inches
Typical profile:
A—0 to 5 inches; loam
BA—5 to 9 inches; loam
Bt—9 to 19 inches; clay loam
BCk—19 to 26 inches; clay loam
Ck—26 to 60 inches; loam

Additional components

Eckley and similar soils: 5 percent
Rock outcrop: 5 percent
Sampson and similar soils: 5 percent
Olnest and similar soils: 3 percent
Vona and similar soils: 2 percent

Management

Major uses: Rangeland (fig. 5)

This map unit is not suited to nonirrigated crops because of the slope and the hazard of water erosion.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are the slope, low precipitation, and the hazards of water erosion and soil blowing. The Kimst soil is also limited by lime-induced chlorosis. This map unit is not suited to windbreaks and environmental plantings in areas where the slope is more than 9 percent. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks on the Kimst soil.

83—Ulmet loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs in the southwestern part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in alluvium. The native vegetation is mainly grasses.

Figure 5.—An area of rangeland on Stoneham-Kimst-Fort Collins loams, 5 to 15 percent slopes, north of Bethune.

Component Description

Ulmet and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 4 inches; loam
BAt—4 to 7 inches; clay loam
Bt1—7 to 12 inches; clay loam
Bt2—12 to 17 inches; clay
Bk1—17 to 26 inches; clay loam
Bk2—26 to 37 inches; clay loam
Bk3—37 to 60 inches; clay loam

Additional components:
Fort Collins and similar soils: 5 percent
Stoneham and similar soils: 5 percent
Weld and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation and the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the

hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

84—Ulysses silt loam, 1 to 3 percent slopes

Setting

Location: This map unit occurs in the southeastern part of the survey area adjacent to Wallace County, Kansas.
Elevation: 3,901 to 4,199 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Ulysses and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.2 inches
Typical profile:
A1—0 to 4 inches; silt loam
A2—4 to 10 inches; silt loam
Bw—10 to 19 inches; silt loam
C—19 to 60 inches; silt loam
Additional components:
Kuma and similar soils: 10 percent
Colby and similar soils: 5 percent
Keith and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitation affecting nonirrigated and irrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. In the Ulysses soil, deep tillage may bring the lime to the surface layer. The Colby soil is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing.

85—Valent sand, 1 to 9 percent slopes

Setting

Location: This map unit occurs in the northern part of the survey area adjacent to Washington and Yuma Counties.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, excessively drained soil is on gently rolling dunes in the sandhills. It formed in fine and medium eolian sand. The native vegetation is mainly mid and tall grasses. Sagebrush is common.

Component Description

Valent and similar soils

Percent of the map unit: 85 percent
Landform: Dunes
Slope range: 1 to 9 percent
Surface layer texture: Sand
Depth to restrictive feature: More than 60 inches
Drainage class: Excessively drained
Parent material: Sandy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches
Typical profile:
A—0 to 8 inches; sand
C—8 to 60 inches; fine sand
Additional components:
Haxtun and similar soils: 5 percent
Julesburg and similar soils: 5 percent
Vona and similar soils: 5 percent

Management

Major uses: Rangeland and irrigated cropland

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

The main limitations affecting irrigated crops are

droughtiness, the slope, fast intake, low organic matter content, and a severe hazard of soil blowing. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients. Tillage should be minimized. Maintaining crop residue on or near the surface can help to control soil blowing and helps to maintain tilth and the content of organic matter.

The main limitations affecting windbreaks and environmental plantings are droughtiness and the severe hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

86—Valent sand, 15 to 45 percent slopes

Setting

Location: This map unit occurs north of Stratton and Vona in the sandhills.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, excessively drained soil is on steep dunes. Revegetated blowouts are common. The soil formed in fine and medium eolian sand. The native vegetation is mainly mid and tall grasses (fig. 6). Sagebrush is common.

Component Description

Valent and similar soils

Percent of the map unit: 90 percent
Landform: Dunes
Slope range: 15 to 45 percent
Surface layer texture: Sand
Depth to restrictive feature: More than 60 inches
Drainage class: Excessively drained
Parent material: Sandy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches
Typical profile:
A1—0 to 4 inches; sand
A2—4 to 7 inches; fine sand
C—7 to 60 inches; fine sand
Additional components:
Dwyer and similar soils: 5 percent
Otero and similar soils: 5 percent

Management

Major uses: Rangeland

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

This map unit is not suited to nonirrigated crops because of the slope, a severe hazard of soil blowing, and droughtiness.

This map unit is not suited to windbreaks and environmental plantings because of the slope.

87—Valent loamy sand, 1 to 5 percent slopes

Setting

Location: This map unit occurs in the northern part of the survey area in the sandhills.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, excessively drained soil is on gently undulating dunes. It formed in fine and medium eolian sand. The native vegetation is mainly mid and tall grasses. Sagebrush is common.

Component Description

Valent and similar soils

Percent of the map unit: 80 percent
Landform: Dunes
Slope range: 1 to 5 percent
Surface layer texture: Loamy sand
Depth to restrictive feature: More than 60 inches
Drainage class: Excessively drained
Parent material: Sandy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches
Typical profile:
A—0 to 9 inches; loamy sand
AC—9 to 14 inches; loamy sand
C—14 to 60 inches; loamy sand
Additional components:
Ascalon and similar soils: 5 percent
Haxtun and similar soils: 5 percent
Julesburg and similar soils: 5 percent
Manter and similar soils: 5 percent

Management

Major uses: Irrigated cropland and rangeland

Figure 6.—The native vegetation in this area of Valent sand, 15 to 45 percent slopes, north of Stratton, is prairie sandreed, sand bluestem, switchgrass, and little bluestem.

The main limitations affecting irrigated crops are droughtiness, fast intake, low organic matter content, and a severe hazard of soil blowing. Tillage should be minimized. Maintaining crop residue on or near the surface helps to control soil blowing and helps to maintain tilth and the content of organic matter. Adjusting applications of irrigation water to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

The main limitations affecting windbreaks and environmental plantings are droughtiness and the severe hazard of soil blowing. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

88—Valent loamy sand, 5 to 15 percent slopes

Setting

Location: This map unit occurs north of Bethune, Stratton, and Vona in the sandhills.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, excessively drained soil is on gently rolling and rolling dunes. It formed in fine and medium eolian sand. The native vegetation is mainly grasses. Sagebrush is common.

Component Description

Valent and similar soils

Percent of the map unit: 80 percent
Landform: Dunes
Slope range: 5 to 15 percent

Surface layer texture: Loamy sand
Depth to restrictive feature: More than 60 inches
Drainage class: Excessively drained
Parent material: Sandy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches
Typical profile:
A—0 to 9 inches; loamy sand
AC—9 to 14 inches; loamy sand
C—14 to 60 inches; loamy sand
Additional components:
Ascalon and similar soils: 5 percent
Dwyer and similar soils: 5 percent
Julesburg and similar soils: 5 percent
Otero and similar soils: 5 percent

Management

Major uses: Rangeland

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

This map unit is not suited to nonirrigated crops because of the droughtiness, a severe hazard of soil blowing, and the slope.

The main limitations affecting windbreaks and environmental plantings are the slope, the severe hazard of soil blowing, and the droughtiness. This unit is not suited to windbreaks and environmental plantings in areas where the slope is more than 9 percent. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

89—Vona fine sandy loam, 5 to 15 percent slopes

Setting

Location: This map unit occurs dominantly in the northeastern part of the survey area.
Elevation: 3,901 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 148 to 152 days
Note: This very deep, well drained soil is on moderately sloping and strongly sloping hills. It formed in fine and medium eolian material. The native vegetation is mainly grasses.

Component Description

Vona and similar soils

Percent of the map unit: 80 percent
Landform: Hills
Slope range: 5 to 15 percent
Surface layer texture: Fine sandy loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.7 inches
Typical profile:
Ap—0 to 5 inches; fine sandy loam
BA—5 to 10 inches; sandy loam
Bt—10 to 15 inches; fine sandy loam
Btk—15 to 25 inches; fine sandy loam
Bk1—25 to 33 inches; fine sandy loam
Bk2—33 to 42 inches; fine sandy loam
C—42 to 61 inches; fine sandy loam
Additional components:
Ascalon and similar soils: 5 percent
Otero and similar soils: 5 percent
Stoneham and similar soils: 5 percent
Valent and similar soils: 5 percent

Management

Major uses: Rangeland

Controlled livestock management is the major management practice needed on this map unit. Brush management may be a suitable management practice if the relative composition of sand sagebrush becomes the limiting factor for forage production on the site.

This map unit is not suited to nonirrigated crops because of the slope and the hazards of water erosion and soil blowing.

The main limitations affecting windbreaks and environmental plantings are the slope, droughtiness, and the hazard of soil blowing. This map unit is not suited to windbreaks and environmental plantings in areas where the slope is more than 9 percent. Cultivating only in the tree rows and leaving a strip of vegetation between the rows can reduce the hazard of soil blowing. Fabricated mulches protect the soil by reducing the acreage of land that is cultivated. Chemical fallow, fabric mulch for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

90—Wages loam, 0 to 2 percent slopes

Setting

Location: This map unit occurs in the eastern part of the survey area.
Elevation: 3,901 to 5,000 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level plains. It formed in eolian material over alluvium. The native vegetation is mainly grasses.

Component Description

Wages and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 0 to 2 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.8 inches
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 12 inches; loam
Bk—12 to 17 inches; loam
C—17 to 60 inches; loam
Additional components:
Ascalon and similar soils: 5 percent
Kimst and similar soils: 5 percent
Satanta and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitation affecting nonirrigated crops is the hazard of soil blowing. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion.

If the Wages soil is tilled deep or is eroded, it may be subject to lime-induced chlorosis. The Kimst soil also is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

91—Wages loam, 2 to 6 percent slopes

Setting

Location: This map unit occurs throughout the survey area.
Elevation: 3,901 to 5,000 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level to moderately sloping plains. It formed in eolian material over alluvium. The native vegetation is mainly grasses.

Component Description

Wages and similar soils

Percent of the map unit: 80 percent
Landform: Plains
Slope range: 2 to 6 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.8 inches
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 12 inches; loam
Bk—12 to 17 inches; loam
C—17 to 60 inches; loam
Additional components:
Ascalon and similar soils: 5 percent
Kimst and similar soils: 5 percent
Sampson and similar soils: 5 percent
Platner and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are the hazards of soil blowing and water erosion and the slope. Because the amount of

precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Tillage should be on the contour or across the slope. Terraces reduce the runoff rate, help to control erosion, and help to conserve moisture.

If the Wages soil is tilled deep or is eroded, it may become subject to lime-induced chlorosis. The Kimst soil also is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

92—Wages loam, 6 to 15 percent slopes

Setting

Location: This map unit occurs throughout the survey area.
Elevation: 3,901 to 5,000 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on moderately sloping and strongly sloping hills. It formed in eolian material over alluvium. The native vegetation is mainly grasses.

Component Description

Wages and similar soils

Percent of the map unit: 80 percent
Landform: Hills
Slope range: 6 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.8 inches
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 12 inches; loam
Bk—12 to 17 inches; loam
C—17 to 60 inches; loam

Additional components:
Stoneham and similar soils: 10 percent
Ascalon and similar soils: 5 percent
Sampson and similar soils: 5 percent

Management

Major uses: Rangeland

Controlled livestock management is the major management practice needed on this map unit.

This map unit is not suited to nonirrigated crops because of the slope and the hazard of water erosion.

The main limitations affecting windbreaks and environmental plantings are the slope and the hazard of soil blowing. This map unit is not suited to windbreaks and environmental plantings in areas where the slope is more than 9 percent. Planting the trees on the contour helps to conserve moisture. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

93—Wages-Kimst loams, 1 to 4 percent slopes

Setting

Location: This map unit occurs in the southeastern part of the survey area and near Vona and Stratton.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 16 inches
Frost-free period: 148 to 150 days
Note: This map unit is on nearly level and gently sloping plains. The Wages soil is on side slopes, and the Kimst soil is on summits. The native vegetation is mainly grasses.

Component Description

Wages and similar soils

Percent of the map unit: 45 percent
Landform: Plains
Slope range: 1 to 4 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.8 inches
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 12 inches; loam

Bk—12 to 17 inches; loam
C—17 to 60 inches; loam

Kimst and similar soils

Percent of the map unit: 30 percent
Landform: Plains
Landform element: Summits
Slope range: 1 to 4 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.5 inches
Typical profile:
A—0 to 6 inches; loam
AC—6 to 12 inches; loam
C—12 to 60 inches; loam

Additional components

Satanta and similar soils: 9 percent
Canyon and similar soils: 5 percent
Norka and similar soils: 5 percent
Rock outcrop: 5 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Irrigated cropland, nonirrigated cropland, and rangeland

The main limitations affecting irrigated and nonirrigated crops are the slope and the hazards of soil blowing and water erosion. The Kimst soil is subject to lime-induced chlorosis. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Maintaining crop residue on or near the surface helps to control runoff and soil blowing and helps to maintain tilth and the content of organic matter.

A high content of lime decreases the available supply of most plant nutrients in the Kimst soil. Chlorosis is apparent, particularly in beans and grain sorghum. If the Wages soil is tilled deep or is eroded, it may become subject to lime-induced chlorosis. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the hazards of water erosion and soil blowing, and increases the water intake rate.

Tillage may be restricted by areas of rock outcrop. The Canyon soil is shallow to bedrock.

Controlled livestock management is the major management practice needed on this map unit.

The main limitation affecting windbreaks and environmental plantings is the hazard of soil blowing. The Kimst soil is subject to lime-induced chlorosis. Planting the trees on the contour helps to conserve moisture. Shrubs and trees that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

94—Wages-Weld complex, 0 to 3 percent slopes

Setting

Location: This map unit occurs south of Bethune and Stratton.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This map unit is on nearly level and gently sloping plains. The native vegetation is mainly grasses.

Component Description

Wages and similar soils

Percent of the map unit: 45 percent
Landform: Plains
Slope range: 1 to 3 percent
Surface layer texture: Loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-loamy eolian deposits over fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.8 inches
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 12 inches; loam
Bk—12 to 17 inches; loam
C—17 to 60 inches; loam

Weld and similar soils

Percent of the map unit: 35 percent
Landform: Plains
Slope range: 0 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding: None

Available water capacity: Mainly 10.4 inches
Typical profile:
A—0 to 5 inches; silt loam
Bt1—5 to 12 inches; silty clay
Bt2—12 to 18 inches; silty clay
Bt3—18 to 28 inches; silty clay loam
C—28 to 60 inches; silt loam

Additional components

Iliff and similar soils: 5 percent
Norka and similar soils: 5 percent
Rago and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Rangeland

Controlled livestock management is the major management practice needed on this map unit.

If this map unit is used for nonirrigated crops, the main limitation is the hazard of soil blowing. Deep tillage may bring lime to the surface layer, resulting in lime-induced chlorosis.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

95—Weld silt loam, 0 to 2 percent slopes

Setting

Location: This map unit occurs dominantly in the western part of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level interfluves. It formed in loess. The native vegetation is mainly grasses.

Component Description

Weld and similar soils

Percent of the map unit: 80 percent
Landform: Interfluves
Landform element: Summits
Slope range: 0 to 2 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.4 inches
Typical profile:
A—0 to 5 inches; silt loam
Bt1—5 to 12 inches; silty clay
Bt2—12 to 18 inches; silty clay
Bt3—18 to 28 inches; silty clay loam
C—28 to 60 inches; silt loam
Additional components:
Keith and similar soils: 5 percent
Norka and similar soils: 5 percent
Rago and similar soils: 5 percent
Pleasant and similar soils: 4 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland (fig. 7), irrigated cropland, and rangeland

The main limitations affecting nonirrigated or irrigated crops are low precipitation, the hazard of soil blowing, and restricted permeability. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Irrigation water should be applied at a rate that ensures optimum production without increasing runoff and erosion. This soil is productive.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

96—Weld-Norka silt loams, 0 to 3 percent slopes

Setting

Location: This map unit occurs dominantly in the western and southern parts of the survey area.
Elevation: 4,301 to 5,200 feet
Mean annual precipitation: 13 to 15 inches
Frost-free period: 145 to 148 days
Note: This map unit is on nearly level and gently

Figure 7.—A stand of nonirrigated winter wheat in an area of Weld silt loam, 0 to 2 percent slopes, west of Bethune.

sloping interfluves. The native vegetation is mainly grasses.

Component Description

Weld and similar soils

Percent of the map unit: 45 percent
Landform: Interfluves
Slope range: 0 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Clayey, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.4 inches
Typical profile:
A—0 to 5 inches; silt loam
Bt1—5 to 12 inches; silty clay
Bt2—12 to 18 inches; silty clay
Bt3—18 to 28 inches; silty clay loam
C—28 to 60 inches; silt loam

Norka and similar soils

Percent of the map unit: 40 percent
Landform: Interfluves

Landform element: Summits
Slope range: 0 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
A—0 to 5 inches; silt loam
Bt—5 to 13 inches; silty clay loam
Bk1—13 to 28 inches; silt loam
Bk2—28 to 39 inches; silt loam
C1—39 to 49 inches; loam
C2—49 to 67 inches; loam

Additional components

Rago and similar soils: 5 percent
Richfield and similar soils: 4 percent
Colby and similar soils: 3 percent
Pleasant and similar soils: 2 percent
Lodgepole and similar soils: 1 percent

Management

Major uses: Nonirrigated cropland, irrigated cropland, and rangeland

The main limitations affecting nonirrigated and irrigated crops are low precipitation and the hazard of soil blowing. The Weld soil is also limited by restricted permeability. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Leaving crop residue on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Irrigation water should be applied at a rate that ensures optimum production without increasing runoff and erosion.

The Colby soil on summits is subject to lime-induced chlorosis. A high content of lime decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation and the hazard of soil blowing. Summer fallow, cultivation for weed control, and selection of adapted plants help to ensure the establishment and survival of seedlings.

97—Wiley silt loam, 0 to 3 percent slopes

Setting

Location: This map unit occurs in the western part of the survey area adjacent to Lincoln County.
Elevation: 4,600 to 5,200 feet
Mean annual precipitation: 14 to 16 inches
Frost-free period: 145 to 148 days
Note: This very deep, well drained soil is on nearly level and gently sloping plains. It formed in loess. The native vegetation is mainly grasses.

Component Description

Wiley and similar soils

Percent of the map unit: 75 percent
Landform: Plains
Slope range: 0 to 3 percent
Surface layer texture: Silt loam
Depth to restrictive feature: More than 60 inches
Drainage class: Well drained
Parent material: Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.6 inches
Typical profile:
Ap—0 to 4 inches; silt loam
Bt—4 to 10 inches; silty clay loam
Btk—10 to 18 inches; silty clay loam
Bk—18 to 23 inches; silty clay loam
C—23 to 60 inches; silt loam
Additional components:
Baca and similar soils: 10 percent
Colby and similar soils: 10 percent
Keith and similar soils: 5 percent

Management

Major uses: Nonirrigated cropland and rangeland

The main limitations affecting nonirrigated crops are low precipitation, low organic matter content, the hazard of soil blowing, and lime-induced chlorosis. Because the amount of precipitation is not sufficient for annual cropping, the best cropping system for nonirrigated crops is one that includes small grain and summer fallow. Tillage should be minimized.

The Colby soil is subject to lime-induced chlorosis, which decreases the available supply of most plant nutrients. Chlorosis is apparent, particularly in beans and grain sorghum. If the Wiley soil is tilled deep, lime-induced chlorosis is apparent. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, reduces the

hazards of water erosion and soil blowing, and increases the water intake rate.

Controlled livestock management is the major management practice needed on this map unit.

The main limitations affecting windbreaks and environmental plantings are low precipitation, the hazard of soil blowing, and lime-induced chlorosis. Summer fallow and cultivation for weed control help to ensure the establishment and survival of seedlings. Trees and shrubs that are not sensitive to lime-induced chlorosis are suitable for use in windbreaks.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It 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 the land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. It could be cultivated land, pasture, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 748,104 acres in Kit Carson County, or about 54 percent of the total acreage, meets the requirements for prime farmland if an adequate and dependable supply of irrigation water is available. Scattered areas of this land are throughout the county, but most are in associations 2, 3, 5, 6, 8, and 11, which are described under the heading "General Soil Map Units."

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

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Soils that receive an inadequate amount of rainfall qualify as prime farmland only in areas where this limitation has been overcome by irrigation. The need for irrigation is indicated in parentheses after the map unit names in table 5. Onsite evaluation is needed to determine whether or not a specific area is 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; 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. 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 some of the 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 are used in some of the tables. These ratings indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

Charles J. Starkovich and Kristi J. Gay, resource conservationists, Natural Resources Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Natural Resources Conservation Service is explained; and the estimated yields of the main crops are listed for each soil.

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

Conservation Service or the Cooperative Extension Service.

About 64 percent of the land in Kit Carson County is cropland. About 48 percent is nonirrigated cropland, and about 16 percent is irrigated cropland. Winter wheat is the major crop. Corn, sunflowers, dry beans, alfalfa, and other crops also are grown.

Nonirrigated Cropland Management

Cropping systems in this area have been developed to maximize captive storage and utilization of soil moisture. Stored soil moisture is more reliable than infrequent precipitation. Historically, a winter wheat/summer fallow crop rotation has been practiced. This rotation requires nearly 2 years to produce a winter wheat crop. With improved residue management practices, producers can increase cropping intensity and decrease fallow frequency in their rotations.

If nonirrigated cropland is not managed properly, soil blowing and water erosion are major problems. Soil blowing is most severe during March and April, when the wind blows mostly from the northwest. It reduces the productivity of the soil and damages growing crops.

Nonirrigated cropland accounts for 48 percent of the acreage in Kit Carson County. The main crop is winter wheat. Sunflowers, corn, millet, and other crops also are grown. Soil blowing and water erosion are major management concerns.

Soil conservation measures that minimize soil loss include:

1. Farming only those soils that are best suited to cultivation.
2. Growing crops that produce large amounts of crop residue.
3. Keeping most of the crop residue on or near the surface thorugh proper management of tillage and grazing after harvest.
4. Keeping the surface rough and cloddy through proper tillage during periods when the amount of crop residue is inadequate.

The best soil conservation practice for minimizing soil loss is residue management. A residue management system is designed to minimize tillage and may include the wise use of pesticides to prevent soil loss and cut production costs while maintaining or increasing yields. Residue management can improve precipitation effectiveness and can also conserve soil moisture.

Residue management may include such practices as no-till, strip till, mulch till, and ridge till. These practices can be applied to:

—control rill and inter-rill erosion
—control soil blowing
—maintain organic matter content
—conserve soil moisture
—manage snow to increase available plant moisture
—provide food and escape cover for wildlife
—conserve organic nutrients and reduce fertilizer and herbicide inputs.

Other practices, such as wind stripcropping, chiseling and subsoiling, or terracing, may also be included in a management system to enhance residue management.

Wind stripcropping is the production of crops in relatively narrow strips perpendicular to the prevailing northwest winds. The purpose of wind stripcropping is to provide barriers to the wind and thus minimize soil movement.

Chiseling and subsoiling can be used to shatter compacted soil layers below the normal plow depth and to improve water infiltration, storage of soil moisture, and root penetration. Compaction is a major management concern, and the soils must be checked regularly to prevent these restrictive layers (hardpans) from occurring.

Terraces are earthen embankments constructed across the slope of the land. They conserve water, protect fields against water erosion, and prevent the loss of topsoil. They are most practical on the deep, gently sloping soils. Terraces should be properly designed and should be used in combination with contour farming, chiseling and subsoiling, and crop residue management.

Soil fertility testing is the key to determining which fields should be fertilized and the proper fertilizer management program needed to obtain maximum economic yields. Applications of nitrogen, phosphorus, and zinc are necessary for optimum yields.

Irrigated Cropland Management

If irrigated cropland is not managed properly, soil erosion is a major problem. Irrigated cropland systems generally produce higher yields than nonirrigated systems. Higher yields generally produce greater amounts of crop residue, but the cropland must be managed to help control soil blowing. Irrigation-induced water erosion can also be a hazard if irrigation water is not applied properly.

Irrigated cropland accounts for 16 percent of the acreage in Kit Carson County. The main crop is corn. Winter wheat, dry beans, and other crops also are grown. Irrigation-induced water erosion is a major management concern, as are water quality, aquifer

depletion, and timely application of irrigation water at the proper stage of crop growth.

The Ogallala Aquifer is the main aquifer in Kit Carson County. It is the ancient buried erosion of the Rocky Mountains, which makes up several aquifers that stretch from Texas to South Dakota. Most of the water in the Ogallala Aquifer has been held within the formation for a few millennia. This aquifer is North America's largest and is rather like a gigantic underground sponge.

Soil and water conservation measures include:

1. Conservation crop rotation

Conservation crop rotation is defined as growing crops in a recurring sequence on the same field. This practice may be applied as part of a conservation management system to support one or more of the following:

control of rill and inter-rill erosion
control of irrigation-induced erosion
control of soil blowing
maintenance of organic matter content

2. Irrigation application hardware

Irrigation water application is generally applied by either a center-pivot sprinkler system or a surface irrigation system using furrows, whereby only part of the surface is wetted down the furrow. Present technology has proven that low-energy precision applications of irrigation water under a sprinkler irrigation system or furrow irrigation using a surge manner of water distribution is the most economical and the most environmentally compatible system of water application.

3. Irrigation water management

Monitoring soil moisture is an important aspect of irrigation. Like a fuel tank on a tractor, the thickness of the soil that supports plant roots has a water-holding capacity. Before irrigation, the water-holding capacity should be determined, and then the soil should be filled to capacity. Various methods of checking soil moisture are available; however, experience has shown that gypsum blocks can be inexpensive, user friendly, and accurate. Other methods include the use of soil probes, moisture-feel tests, or more expensive means of soil moisture monitoring, such as neutron probes. Soil moisture information gained from the various methods are combined with evapotranspiration (ET) data to schedule the proper timing and amounts of water used in irrigating crops.

4. Crop residue management

Using crop residue to trap snowfall during the winter by leaving the residue standing upright is important.

Crop residue also helps to control erosion, conserves soil moisture and organic nutrients, and can provide food and escape cover for wildlife.

5. Soil structure management

Monitoring soil structure is important in preventing the buildup of compacted soil layers (hardpan) under a continuous irrigated cropland rotation. Chiseling and subsoiling are used to shatter compacted soil layers. Caution must also be used to minimize compaction by not cultivating or tilling the soil during wet periods.

If soils are fall plowed, leaving the plowed soil in the rough condition for winter freeze-up is very important. The rough soil is cloddy, controls soil blowing, and catches rainfall in the spring.

6. Nutrient management

Soil and water testing is a key aspect of developing a nutrient management plan. Soils in each field under irrigation should be individually tested to determine a proper fertilizer management program and thus obtain maximum economic yields. For optimum yields, macronutrients and micronutrients should be tailored to the soils.

Irrigation water should also be tested for nitrate-nitrogen. The estimated amount of nitrogen applied during an irrigation season should be included in the annual nutrient budget.

An important effect of irrigating cropland is the beneficial use for supplemental livestock grazing and the extra feed derived from this use.

Overall, irrigating cropland provides a solid economic condition for the county's economy.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management on both nonirrigated and irrigated cropland are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall, pests, disease, and weed infestations. The land capability classification also is shown in the table.

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

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 recommended conservation practices are implemented.

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.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by 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 few limitations that restrict their use.

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

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

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

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 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, woodland, wildlife habitat, or recreation.

The capability classification of the map units in this survey area is given in table 6.

Rangeland

Ben P. Berlinger, area range conservationist, Natural Resources Conservation Service, helped prepare this section.

About 36 percent of the acreage in Kit Carson County is rangeland. About 62 percent of the farm income is derived from the sale of livestock, principally cattle (U.S. Department of Commerce, 1989). Cow-calf-yearling enterprises are the dominant types of ranching. The ranches are intermingled with cropland. On many ranches the forage produced on the rangeland is supplemented with wheat pasture and the grazing of crop residue. During the winter the range forage is typically supplemented by protein supplements, energy supplements, or both.

Soils strongly influence the native vegetation. Most of the county has loamy and silty soils that support a potential plant community dominated by blue grama, western wheatgrass, green needlegrass, and buffalograss. The sandy soils generally north of

Stratton and Bethune support a potential plant community in which the dominant species include prairie sandreed, sand bluestem, switchgrass, needleandthread, and sideoats grama. Annual forage production on sandy soils is slightly higher than that on loamy soils and is substantially higher than that on the fine textured soils. Some of the soils south of Flagler formed in material weathered from shale. These soils are calcareous and fine textured. They support a potential plant community dominated by alkali sacaton, green needlegrass, western wheatgrass, blue grama, and shrubs, such as fourwing saltbush and winterfat.

Sound range management based on soil survey information and rangeland inventories can increase forage production in the survey area. Proper grazing management is the major management need. It benefits the many values associated with rangeland, such as wildlife, watershed stability, recreation, and natural beauty. The density, intensity, and frequency of grazing should be controlled so that the kinds and amounts of plants that make up the potential or desired plant community are maintained. The maximum recommended levels of utilization vary by the intensity and complexity of the grazing management system, but a conservative goal is to generally maintain about 50 percent, by weight, of the current season's growth of selected key species at the end of the growing season.

If the range is overgrazed, the proportion of preferred forage plants decreases and the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. The application of a planned grazing system improves the condition of a range site and enhances wildlife habitat. Deferment is the postponement of grazing during a critical part of the growing season for key forage plants. For the cool-season grasses in the survey area, such as western wheatgrass and needleandthread, the deferment period should be planned from May 1 through August 15. The major warm-season grasses, such as switchgrass, sand bluestem, and blue grama, benefit by periodic deferment from June 1 through September 30. Rotating deferment among several pastures improves the entire rangeland unit. It allows the forage plants to grow to an adequate height before they are grazed and thus helps them to replenish root carbohydrate reserves and develop mature seed. Fencing, developing water areas, and distributing salt help to achieve a more uniform distribution of grazing and the successful implementation of a planned grazing system.

Range seeding may be necessary to improve seriously depleted rangeland. Sandy soils can be seeded by interseeding, which minimizes soil disturbance and controls the hazard of erosion. Loamy soils can be seeded most successfully by drilling the grass seed into a preparatory stubble cover of sorghum or sudan. The best time for range seeding in the survey area is from November to mid-May. Brush control is effective where competing shrubs, such as sand sagebrush, have so increased that they greatly exceed their extent in the potential plant community and exclude the desired grasses and forbs because of competition for soil and solar resources. Deferment of grazing for 1 or 2 years after brush-control measures are applied allows the desired forage grasses to become established. Effective management is based on knowledge of the relationship among the soils, vegetation, and climate.

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

Table 7 shows, for each soil that supports vegetation suitable for grazing, the ecological site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. An explanation of the column headings in table 7 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 througout 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 the 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.

Total dry-weight production is the amount of vegetation that can be expected to grow annually in a well managed area 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.

Characteristic vegetation—the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil—is listed by common name. Under *composition*, the expected percentage of the total annual production is given for each species making up the characteristic forest or rangeland vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

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 chapter 4 of the "National Range and Pasture Handbook," which is available in local offices of the Natural Resources Conservation Service.

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

Greg Sundstrom, forester, Colorado State Forest Service and Natural Resources Conservation Service, helped prepare this section.

While most of the native plant cover in Kit Carson County is grass, the bottomland forest type, consisting of plains cottonwood and willows, is in riparian zones along the South Fork of the Republican River and its tributaries. The climate has precluded the natural spread of trees from other regions, so naturally wooded areas are scarce.

The first trees and shrubs in Kit Carson County were planted under the Timber Culture Act of 1873 when the county was being settled. Settlers planted 10 acres of trees in order to acquire public land for a homestead. These timber claims go back to at least 1886. Few remnants of these early plantings remain.

Locating trees and shrubs away from their natural range places them in a stressful environment, causing them to be more susceptible to insect, disease, and environmental damage. To offset these factors and have a successful planting, the landowner should invest in the highest quality seedlings available, use those species that are adapted to the soils in the area, and prepare a quality planting site.

Limited available soil moisture is the main factor restricting windbreak plantings in Kit Carson County. Providing supplemental water and controlling vegetation, such as grasses and weeds, help to overcome this limitation. Drip irrigation and the use of plastics (fabricated mulches) for water collection, evaporation barriers, and weed control are newer windbreak technologies that have increased the first-year survival of plantings from 50 to more than 90 percent in areas that have limited soil moisture.

Early settlers used trees for fuel, lumber, and fence posts. Today in Kit Carson County, trees and shrubs are grown on most of the farmsteads and ranch headquarters primarily to provide protection, control drifting snow, and improve esthetics (fig. 8).

Tree planting is continually needed because trees and shrubs pass maturity and deteriorate; insects, disease, or storms can destroy individual trees or segments of tree rows in windbreaks; and new plantings are needed in areas where farming or ranching is expanding.

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and

Figure 8.—A living snow fence in an area of Rago-Weld silt loams, 0 to 2 percent slopes, east of Stratton and adjacent to U.S. Highway 24.

gardens, and they furnish wildlife habitat. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection. A minimum of two rows is necessary for adequate protection in Kit Carson County. In areas where space is limited, a high-density design consisting of two closely spaced rows with dense in-row tree spacing can be used, but a design of 5 to 7 rows with 20 to 24 feet between the rows gives the best results. Within rows in multiple-row windbreaks, in-row spacing of 14 to 18 feet for deciduous trees, 12 to 16 feet for evergreen trees, and 4 to 6 feet for shrubs provides the best protection and room enough for individual trees to reach their growth potential.

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. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced for these purposes. Environmental plantings also help to beautify and add to the esthetics of the locale while providing food and cover for wildlife. Planting healthy stock of suitable species on a well prepared site and following a well developed maintenance plan help to ensure plant survival.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established

plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service, the Colorado State Forest Service, or the Cooperative Extension Service or from a commercial nursery.

Recreation

The soils of the survey area are rated in tables 9a and 9b according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. 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 tables 9a and 9b 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 water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife Habitat

Terri J. Skadeland, biologist, Natural Resources Conservation Service, helped prepare this section.

The wildlife species in Kit Carson County include those that typically inhabit the plains or rangeland in Colorado. Some of the abundant or common species are pronghorn, black-tailed jackrabbit, white-tailed jackrabbit, desert cottontail, northern bobwhite, western meadowlark, horned lark, numerous species of sparrows, swallows, and other songbirds, shorebirds, raptors, mink, swift fox, striped skunk, opossum, and bats. Other important species include ring-necked pheasant, wild turkey, great horned owls, mule deer, white-tailed deer, and coyotes. Permanent water areas are limited to tailwater pits, lagoons, the South Fork of the Republican River, and the Flagler Reservoir. Seasonal water is provided in intermittent streams and in playa lakes. These aquatic habitats attract waterfowl, herons, bitterns, and numerous shorebirds. Overall, the scarcity of water limits these species.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

Vegetative components of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, millet, grain sorghum, sunflowers, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. These plants may be either native or introduced. They are often used to

provide feed for livestock. Grasses and legumes are used for nesting, food, and cover by wildlife species. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are bluestems, buffalograss, switchgrass, indiangrass, grama grass, wheatgrass, bromegrass, native milkvetch, alfalfa, sweetclover, peavine, wild licorice, prairie-clover, and scurfpea.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. These plants provide food and cover for wildlife. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are primrose, scarlet globemallow, sunflower, prairie coneflower, mentzelia, goldenrod, and spiderwort.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of fruit-producing shrubs are American plum, sandcherry, yucca, leadplant, sagebrush, fourwing saltbush, and willows.

Wetland plants are annual and perennial wild herbaceous plants that are adapted to anaerobic soil conditions and grow on moist or wet sites. These plants provide valuable nesting and escape cover for both wetland and upland wildlife. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are playas, potholes, marshes, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include quail, pheasant, meadowlark, songbirds, rabbits, fox, ground squirrels, and mice.

Habitat for woodland wildlife consists of areas of deciduous plants, coniferous plants, or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are frogs, ducks, geese, herons, shorebirds, and mink.

Habitat for rangeland wildlife consists of areas of native grasses and associated shrubs and forbs, including native legumes. Wildlife attracted to rangeland include antelope, deer, jackrabbits, coyote, cottontail rabbits, meadowlark, lark bunting, upland game birds, songbirds, raptors, rodents, and small mammals.

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 estimated 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 within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

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 grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

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. Tables 11a and 11b show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables 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 building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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

ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

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

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

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils 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.

Selection of adapted vegetation, native vegetation, or both is critical for the establishment of lawns, shrubs, trees, and vegetable gardens. In summer, irrigation is required for lawn grasses, shrubs, vines, shade trees, and ornamental trees.

Sanitary Facilities

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

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. 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 downslope 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

Tables 13a and 13b give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. 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 13a, 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.

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).

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.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

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

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

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

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

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

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones

and depth to bedrock or a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

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

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 shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

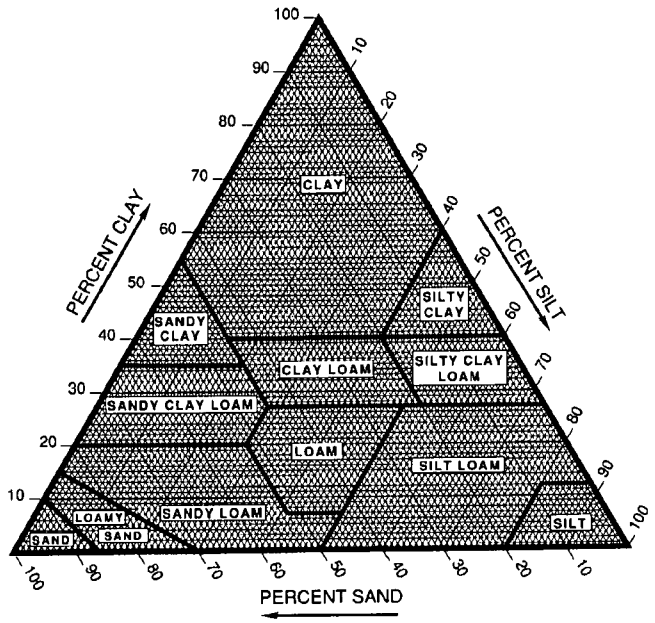

Figure 9.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 9). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1986).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH,

and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 16, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine 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-bar moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each major 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. A bulk density of more than 1.6 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" has traditionally been used to indicate saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of movement of water 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 major soil layer. The capacity varies, depending on soil properties that affect retention of water and depth of the root zone. 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 shrink-swell potential is rated moderate to very high, 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 16, 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 or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Erosion factors are shown in table 16 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) 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 (as much as 4 percent) 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 resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. The soils assigned to group 1 are the most susceptible to soil blowing, 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 soil blowing because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to soil blowing, or the tons per acre per year that can be expected to be lost to soil blowing. There is a close correlation between soil blowing 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 soil blowing.

Chemical Properties

Table 17 shows estimates of some characteristics and features that affect soil behavior. The estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

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. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major 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 and can be dissolved and removed by water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Water Features

Table 18 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 18 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 18 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, the temporary inundation of an area, is 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 are 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 19 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 otherwise provide an unfavorable root environment. Examples include bedrock, cemented layers, dense layers, and frozen layers. *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 mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves 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 in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel 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

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1975). 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 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven 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 Mollisol.

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 Ustoll (*Ust*, referring to an ustic moisture regime, plus *oll*, from Mollisol).

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; 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 Argiustolls (*Argi*, meaning argillic horizon, plus *ustoll*, the suborder of the Mollisols that has an ustic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic 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 known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. An example is Aridic Argiustolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, superactive, mesic Aridic Argiustolls.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

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" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1975). Unless otherwise stated, matrix colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

Altvan Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills and plains
Parent material: Eolian material over alluvium
Slope range: 3 to 20 percent

Average annual precipitation: 13 to 15 inches
Average annual air temperature: 47 to 50 degrees F
Frost-free period: 145 to 148 days
Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Aridic Argiustolls

Typical Pedon

Altvan loam, 6.0 miles north and 6.5 miles west of Bushnell, Nebraska; 2,160 feet east and 100 feet south of the northwest corner of sec. 31, T. 16 N., R. 58 W.

Ap—0 to 6 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; neutral; abrupt smooth boundary.
A—6 to 8 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable; neutral; abrupt smooth boundary.
BA—8 to 12 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable; neutral; clear smooth boundary.
Bt—12 to 23 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; faint patchy clay films on faces of peds; slightly alkaline; clear smooth boundary.
Bk—23 to 26 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable; carbonate coatings on faces of peds and in root channels, pores, or both; violently effervescent; moderately alkaline; clear smooth boundary.
C1—26 to 35 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; massive; soft, very friable; strongly effervescent; strongly alkaline; gradual wavy boundary.
2C2—35 to 60 inches; pale brown (10YR 6/3) gravelly sand, brown (10YR 5/3) moist; single grain; strongly effervescent; 20 percent gravel; strongly alkaline.

Range in Characteristics

Depth to carbonates: 16 to 38 inches
Depth to the 2C horizon: 20 to 40 inches
Thickness of the mollic epipedon: 7 to 20 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Reaction—neutral

Bt horizon:
Hue—10YR
Value—5 to 7 dry, 4 to 6 moist
Chroma—2 or 3
Texture of the fine-earth fraction—clay loam
Reaction—slightly alkaline or moderately alkaline

Bk horizon:
Hue—10YR
Value—5 to 7 dry, 4 to 6 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Reaction—moderately alkaline

C horizon:
Hue—10YR
Value—6 to 8 dry, 5 or 6 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Reaction—strongly alkaline

2C horizon:
Hue—10YR
Value—5 to 7 dry, 4 to 6 moist
Chroma—3 or 4
Texture of the fine-earth fraction—gravelly sand
Reaction—strongly alkaline

Aridic Ustorthents

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills
Parent material: Alluvium
Slope range: 9 to 25 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 48 to 51 degrees F
Frost-free period: 148 to 150 days
Taxonomic classification: Aridic Ustorthents

Typical Pedon

Aridic Ustorthents, in an area of Colby-Aridic Ustorthents complex, 9 to 25 percent slopes, gullied, about 1,000 feet south and 1,900 feet west of the northeast corner of sec. 13, T. 6 S., R. 44 W.; USGS Idalia, Colorado, SE, topographic quadrangle; lat. 30 degrees 31 minutes 42 seconds N. and long. 102 degrees 15 minutes 52 seconds W.

A—0 to 4 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak thick platy structure parting to weak fine subangular blocky; soft, very

friable, nonsticky and slightly plastic; slightly effervescent; moderately alkaline; clear smooth boundary.

AC—4 to 8 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; common very fine and fine roots; few very fine and fine vesicular pores; slightly effervescent; 2 percent gravel; moderately alkaline; gradual smooth boundary.

C1—8 to 17 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine and fine vesicular pores; slightly effervescent; 5 percent gravel; moderately alkaline; clear smooth boundary.

C2—17 to 35 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak thick platy structure; slightly hard, friable, nonsticky and slightly plastic; common very fine and fine roots; common very fine vesicular pores; slightly effervescent; 10 percent gravel; moderately alkaline; clear smooth boundary.

C3—35 to 63 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive; soft, friable, nonsticky and slightly plastic; few very fine roots; common very fine vesicular pores; slightly effervescent; moderately alkaline.

Range in Characteristics

A horizon:
Hue—10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Reaction—moderately alkaline

C horizon:
Hue—10YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Reaction—moderately alkaline

Arvada Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Very slow
Landform: Alluvial fans
Parent material: Alluvium
Slope range: 0 to 1 percent
Average annual precipitation: 13 to 14 inches
Average annual air temperature: 45 to 47 degrees F
Frost-free period: 140 to 145 days
Taxonomic classification: Fine, smectitic, mesic Ustic Natrargids

Typical Pedon

Arvada fine sandy loam is included in areas of Beckton silt loam, 1 to 6 percent slopes. The type location for the series is 650 feet south and 200 feet west of the northeast corner of sec. 29, T. 55 N., R. 78 W.; lat. 44 degrees 43 minutes 7 seconds N. and long. 106 degrees 15 minutes 54 seconds W., Sheridan County, Wyoming.

E—0 to 4 inches; light gray (10YR 7/2) fine sandy loam, grayish brown (10YR 5/2) moist; moderate very thin platy structure parting to moderate very fine granular; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; slightly alkaline; abrupt smooth boundary.

Btn—4 to 14 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium columnar structure parting to moderate medium angular blocky; extremely hard, firm, moderately sticky and very plastic; common medium roots; many prominent clay films on faces of peds and in root channels, pores, or both; very strongly alkaline; 20 percent ESP (exchangeable sodium percentage); clear smooth boundary.

Btkn—14 to 20 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium angular blocky structure; extremely hard, firm, moderately sticky and very plastic; few faint clay films on faces of peds and in root channels, pores, or both; few fine threads of carbonate; strongly effervescent; strongly alkaline; 20 percent ESP (exchangeable sodium percentage); gradual smooth boundary.

Bkny—20 to 60 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; massive; hard, friable, moderately sticky and moderately plastic; common medium threads and masses of carbonate in cracks and common medium threads and masses of gypsum in cracks; violently effervescent; strongly alkaline; 20 percent ESP (exchangeable sodium percentage).

Range in Characteristics

Depth to layers that have more than 15 percent exchangeable sodium: 4 to 15 inches

E horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 to 4

Texture of the fine-earth fraction—fine sandy loam or clay loam
Reaction—slightly alkaline

Btn horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—clay loam or clay
Reaction—very strongly alkaline

Btkny horizon:
Hue—2.5Y
Value—5 or 6 dry, 4 or 5 moist
Texture of the fine-earth fraction—typically silty clay loam but ranges to clay loam
Reaction—strongly alkaline or very strongly alkaline

Ascalon Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills and plains
Parent material: Eolian material
Slope range: 0 to 15 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aridic Argiustolls

Typical Pedon

Ascalon sandy loam, in an area of Manter-Ascalon sandy loams, 5 to 15 percent slopes, about 420 feet north and 2,400 feet east of the southwest corner of sec. 36, T. 11 S., R. 50 W.; USGS Big Spring Creek, Colorado, topographic quadrangle; lat. 39 degrees 2 minutes 29 seconds N. and long. 103 degrees 56 minutes 59 seconds W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, friable, nonsticky and slightly plastic; common very fine and fine roots; slightly alkaline; clear smooth boundary.

Bt1—6 to 10 inches; dark grayish brown (10YR 4/2) sandy clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few faint patchy clay films on faces of peds and clay bridged between sand grains; slightly alkaline; clear smooth boundary.

Bt2—10 to 21 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; common very fine and fine and few medium roots; very few faint patchy clay films on faces of peds and clay bridged between sand grains; slightly alkaline; clear wavy boundary.

Bk1—21 to 37 inches; very pale brown (10YR 7/3) sandy clay loam, pale brown (10YR 6/3) moist; weak medium and coarse prismatic structure parting to weak coarse subangular blocky; hard, firm, very sticky and very plastic; few very fine and fine roots; many rounded carbonate nodules; violently effervescent; moderately alkaline; gradual wavy boundary.

Bk2—37 to 50 inches; light gray (10YR 7/2) sandy clay loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure parting to weak coarse subangular blocky; slightly hard, firm, very sticky and very plastic; few fine roots; many rounded carbonate nodules; violently effervescent; moderately alkaline; clear wavy boundary.

C—50 to 60 inches; very pale brown (10YR 7/3) sandy loam, light brownish gray (10YR 6/2) moist; massive; soft, friable, slightly sticky and slightly plastic; few fine roots; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 16 inches
Depth to the base of the argillic horizon: 19 to 24 inches
Depth to calcareous material: 8 to 24 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—sandy loam, fine sandy loam, loam
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—4 or 5 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—sandy clay loam
Fine-earth fraction—20 to 35 percent clay
Reaction—neutral or slightly alkaline

Bk horizon:
Hue—10YR
Value—6 or 7 dry, 4 to 6 moist

Chroma—2 to 4
Texture of the fine-earth fraction—sandy loam, sandy clay loam, loam, or fine sandy loam
Fine-earth fraction—8 to 30 percent clay
Calcium carbonate equivalent—5 to 10 percent

C horizon:
Hue—10YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—loamy fine sand or sandy loam
Fine-earth fraction—3 to 12 percent clay
Calcium carbonate equivalent—5 to 10 percent

Baca Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Plains
Parent material: Loess
Slope range: 0 to 3 percent
Average annual precipitation: 14 to 16 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 145 to 148 days
Taxonomic classification: Fine, smectitic, mesic Aridic Haplustalfs

Typical Pedon

Baca silt loam is included in areas of Wiley silt loam, 0 to 3 percent slopes. The type location for the series is 230 feet east of the northwest corner of sec. 5, T. 33 S., R. 48 W., Baca County, Colorado.

A—0 to 5 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate very fine granular structure; soft, very friable; neutral; clear smooth boundary.
BA—5 to 8 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; weak fine and medium prismatic structure parting to moderate fine subangular blocky; slightly hard, very friable; few faint clay films on horizontal and vertical faces of peds; slightly alkaline; clear smooth boundary.
Bt—8 to 20 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; moderate and strong prismatic structure parting to moderate and strong very fine and fine angular blocky; very hard, friable; few distinct clay films; slightly alkaline; gradual smooth boundary.
Btk—20 to 24 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak and moderate medium subangular blocky; hard, friable; few distinct clay films on horizontal and vertical faces of peds; few carbonate concretions; strongly effervescent; moderately alkaline; gradual smooth boundary.
Bk—24 to 44 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive; hard, very friable; few carbonate concretions and few fine carbonate threads; strongly effervescent; moderately alkaline; gradual smooth boundary.
C—44 to 60 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive; slightly hard, friable; few carbonate concretions; moderately alkaline.

Range in Characteristics

Depth to calcareous material: 8 to 20 inches

A horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam
Reaction—neutral

Bt horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silty clay loam

Bk or C horizon:
Hue—10YR
Texture of the fine-earth fraction—clay loam or loam
Reaction—moderately alkaline

Bankard Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Rapid
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent
Average annual precipitation: 14 to 17 inches
Average annual air temperature: 48 to 51 degrees F
Frost-free period: 145 to 150 days
Taxonomic classification: Sandy, mixed, mesic Ustic Torrifluvents

Typical Pedon

Bankard loamy sand, in an area of Glenberg, rarely flooded-Bankard, occasionally flooded, complex, 0 to 3 percent slopes, about 2,100 feet south and 1,410 feet east of the northwest corner of sec. 17, T. 7 S., R. 44 W.; USGS Burlington, Colorado, NE, topographic

quadrangle; lat. 39 degrees 26 minutes 26 seconds N. and long. 102 degrees 20 minutes 49 seconds W.

A—0 to 4 inches; light yellowish brown (10YR 6/4) loamy sand, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; slightly effervescent; slightly alkaline; abrupt smooth boundary.

C—4 to 60 inches; very pale brown (10YR 7/3) sand, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; slightly effervescent; slightly alkaline.

Range in Characteristics

Depth to calcareous material: 0 to 13 inches

A horizon:
- Hue—10YR
- Value—5 or 6 dry, 3 or 4 moist
- Chroma—2 to 4
- Texture of the fine-earth fraction—loamy sand
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—slightly alkaline

C horizon:
- Hue—10YR
- Value—5 to 7 dry, 4 to 6 moist
- Chroma—2 or 3
- Texture of the fine-earth fraction—loamy sand or sand
- Content of clay in the fine-earth fraction—0 to 10 percent
- Calcium carbonate equivalent—1 to 5 percent
- Reaction—slightly alkaline or moderately alkaline

Bayard Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Alluvial fans
Parent material: Alluvium
Slope range: 2 to 6 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 48 to 51 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Torriorthentic Haplustolls

Typical Pedon

Bayard fine sandy loam, 2 to 6 percent slopes, in an area of grass, about 5 miles west and 1 mile south of Wray, 800 feet south and 800 feet east of the northwest corner of sec. 17, T. 1 N., R. 44 W.

A1—0 to 5 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; slightly alkaline; clear smooth boundary.

A2—5 to 15 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, very friable, nonsticky and nonplastic; common very fine and fine roots; slightly alkaline; clear wavy boundary.

Bk1—15 to 21 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; few fine rounded soft masses of carbonate; violently effervescent; moderately alkaline; clear wavy boundary.

Bk2—21 to 36 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; few medium rounded soft masses of carbonate; violently effervescent; moderately alkaline; gradual wavy boundary.

C—36 to 60 inches; very pale brown (10YR 7/3) loamy fine sand, brown (10YR 5/3) moist; single grain; loose; few very fine and fine roots; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 8 to 20 inches
Depth to calcareous material: 8 to 18 inches
Content of rock fragments: 0 to 15 percent

A horizon:
- Hue—10YR
- Value—4 or 5 dry, 2 or 3 moist
- Chroma—2 or 3
- Reaction—neutral or slightly alkaline

Bk or C horizon:
- Hue—10YR
- Value—5 to 7 dry, 4 to 6 moist
- Chroma—2 or 3

Texture of the fine-earth fraction—fine sandy loam or loamy fine sand

Beckton Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Stream terraces
Parent material: Alluvium
Slope range: 1 to 6 percent
Average annual precipitation: 13 to 15 inches
Average annual air temperature: 45 to 48 degrees F
Frost-free period: 148 to 150 days
Taxonomic classification: Fine, smectitic, mesic Aridic Natrustolls
Taxadjunct features: The Beckton soil in map unit 11 has a longer frost-free period than is defined as the range for the series. This difference does not significantly affect the use and management of the soil.

Typical Pedon

Beckton silt loam, 1 to 6 percent slopes, about 850 feet north and 1,950 feet west of the southeast corner of sec. 4, T. 9 S., R. 50 W.; USGS Flagler Reservoir, Colorado, topographic quadrangle; lat. 39 degrees 17 minutes 22 seconds N. and long. 102 degrees 59 minutes 18 seconds W.

A—0 to 2 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; slightly alkaline; abrupt smooth boundary.

Btn1—2 to 4 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; strong medium columnar structure parting to strong medium subangular blocky; hard, very firm, moderately sticky and moderately plastic; many very fine and fine roots; few very fine tubular pores; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds and light brownish gray (10YR 6/2) coats on faces of peds; moderately alkaline; abrupt smooth boundary.

Btn2—4 to 8 inches; brown (10YR 5/3) silty clay, dark brown (10YR 3/3) moist; strong medium prismatic structure parting to strong medium subangular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots; few very fine tubular pores; common distinct dark brown (10YR 3/3) clay films on faces of peds; strongly effervescent; very strongly alkaline; clear smooth boundary.

Btn3—8 to 17 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; common distinct brown (10YR 4/3) clay films on faces of peds and very pale brown (10YR 7/3) coats on faces of peds; violently effervescent; very strongly alkaline; clear smooth boundary.

Btn4—17 to 24 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; few distinct brown (10YR 5/3) clay films on faces of peds; violently effervescent; very strongly alkaline; gradual smooth boundary.

C—24 to 60 inches; light yellowish brown (10YR 6/4) silty clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine and fine tubular pores; violently effervescent; very strongly alkaline.

Range in Characteristics

Special features: Some pedons have an E horizon.

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam
Fine-earth fraction—20 to 24 percent clay
Reaction—slightly alkaline or moderately alkaline

Bt horizon:
Hue—10YR
Value—5 or 6 dry, 3 to 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay loam or silty clay
Fine-earth fraction—35 to 40 percent clay
Calcium carbonate equivalent—5 to 10 percent
Reaction—moderately alkaline to very strongly alkaline

C horizon:
Hue—10YR
Value—5 to 8 dry, 4 to 6 moist
Chroma—2 to 4

Texture of the fine-earth fraction—silty clay loam
Reaction—very strongly alkaline

Bethune Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Landform: Plains
Parent material: Loess over weakly cemented, calcareous sandstone
Slope range: 0 to 2 percent
Average annual precipitation: 13 to 15 inches
Average annual air temperature: 45 to 48 degrees F
Frost-free period: 148 to 150 days
Taxonomic classification: Fine, smectitic, mesic Aridic Argiustolls

Typical Pedon

Bethune silty clay loam, 0 to 2 percent slopes, about 750 feet south and 750 feet west of the northeast corner of sec. 35, T. 10 S., R. 45 W.; USGS South of Bethune, Colorado, topographic quadrangle; lat. 39 degrees 8 minutes 32 seconds N. and long. 102 degrees 23 minutes 31 seconds W.

Ap—0 to 4 inches; brown (10YR 5/3) silty clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common very fine and fine roots; 2 percent subrounded limestone-sandstone gravel; slightly alkaline; abrupt smooth boundary.

Bt—4 to 11 inches; very dark grayish brown (10YR 3/2) silty clay, very dark brown (10YR 2/2) moist; strong medium prismatic structure parting to strong fine angular blocky; very hard, firm, very sticky and very plastic; common very fine and fine roots; common very fine and fine tubular pores; many distinct clay films on faces of peds and distinct clay films in root channels, pores, or both; slightly alkaline; clear smooth boundary.

BCk—11 to 17 inches; brown (10YR 5/3) silty clay, brown (10YR 4/3) moist; weak coarse subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine and fine roots; few very fine and fine tubular pores; common fine and medium irregular soft masses of lime; strongly effervescent; moderately alkaline; 5 percent gravel; gradual wavy boundary.

Ck—17 to 25 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 5/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine tubular pores; many fine and medium irregular soft masses of lime; violently effervescent; moderately alkaline; 20 percent gravel; abrupt wavy boundary.

Cr—25 to 29 inches; soft, calcareous sandstone.

Range in Characteristics

Depth to weathered sandstone: 20 to 40 inches
Depth to the base of the argillic horizon: 8 to 11 inches
Depth to calcareous material: 8 to 11 inches

Ap horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay loam
Fine-earth fraction—32 to 36 percent clay

Bt horizon:
Hue—10YR
Value—3 or 4 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay
Fine-earth fraction—40 to 45 percent clay, 40 to 60 percent silt, 5 to 15 percent sand

BCk horizon:
Hue—10YR and 2.5Y
Value—5 to 7 dry, 4 to 6 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay loam, clay loam, silty clay
Fine-earth fraction—35 to 45 percent clay
Calcium carbonate equivalent—20 to 30 percent

Ck horizon:
Hue—10YR and 2.5Y
Value—6 to 8 dry, 5 to 7 moist
Chroma—1 to 3
Texture of the fine-earth fraction—gravelly clay loam
Fine-earth fraction—30 to 35 percent clay
Content of rock fragments—15 to 20 percent gravel
Calcium carbonate equivalent—30 to 40 percent
Reaction—moderately alkaline or strongly alkaline

Bijou Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Rapid
Landform: Plains
Parent material: Eolian material over alluvium
Slope range: 3 to 6 percent
Average annual precipitation: 13 to 15 inches

Average annual air temperature: 45 to 47 degrees F
Frost-free period: 140 days
Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Ustic Haplargids

Typical Pedon

Bijou loamy sand is included in an area of Otero-Olnest sandy loams, 3 to 6 percent slopes. The type location for the series is 190 feet west and 175 feet north of the southeast corner of sec. 25, T. 4 N., R. 59 W., Morgan County, Colorado.

A1—0 to 10 inches; brown (10YR 5/3) loamy sand, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 5 percent angular gravel; neutral; clear smooth boundary.
A2—10 to 15 inches; brown (10YR 5/3) loamy sand, brown (10YR 4/3) moist; weak medium subangular blocky structure parting to weak fine granular; slightly hard, very friable, nonsticky and nonplastic; 5 percent angular gravel; neutral; clear smooth boundary.
Bt—15 to 28 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; moderate very coarse prismatic structure parting to moderate medium subangular blocky; hard, very friable, nonsticky and nonplastic; faint patchy clay films on faces of peds and discontinuous clay films in root channels, pores, or both; 5 percent angular gravel; neutral; clear smooth boundary.
BC—28 to 33 inches; light olive brown (2.5Y 5/4) sandy loam, olive brown (2.5Y 4/3) moist; weak coarse angular blocky structure; hard, very friable, nonsticky and nonplastic; very few patchy clay films on faces of peds; 5 percent angular gravel; slightly alkaline; clear smooth boundary.
C—33 to 60 inches; light yellowish brown (2.5Y 6/3) loamy sand, light olive brown (2.5Y 5/3) moist; massive; very hard, loose, nonsticky and nonplastic; 10 percent angular gravel; slightly alkaline.

Range in Characteristics

Depth to calcareous material: 40 to more than 60 inches
Depth to the base of the argillic horizon: 12 to 40 inches

A horizon:
Hue—10YR
Value—4 to 7 dry, 3 to 6 moist
Chroma—1 to 4
Reaction—neutral

Bt horizon:
Hue—10YR
Value—4 to 7 dry, 3 to 6 moist
Chroma—1 to 6
Texture of the fine-earth fraction—sandy loam
Reaction—neutral or slightly alkaline

C horizon:
Hue—10YR or 2.5Y
Value—5 to 7 dry, 4 to 6 moist
Chroma—2 to 6
Texture of the fine-earth fraction—loamy sand
Reaction—slightly alkaline

Canyon Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderate
Landform: Hills and plains
Parent material: Residuum derived from weakly cemented, calcareous sandstone
Slope range: 2 to 60 percent
Average annual precipitation: 14 to 17 inches
Average annual air temperature: 48 to 51 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents

Typical Pedon

Canyon gravelly loam, in an area of Canyon-Rock outcrop complex, 5 to 60 percent slopes, about 150 feet south and 1,900 feet east of the northwest corner of sec. 3, T. 6 S., R. 45 W.; USGS Idalia, Colorado, SW, topographic quadrangle; lat. 39 degrees 33 minutes 53 seconds N. and long. 102 degrees 25 minutes 18 seconds W.

A—0 to 3 inches; brown (10YR 5/3) gravelly loam, brown (10YR 4/3) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; strongly effervescent; 15 percent gravel; moderately alkaline; clear smooth boundary.
AC—3 to 7 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; strongly effervescent; moderately alkaline; clear smooth boundary.
C—7 to 10 inches; very pale brown (10YR 8/2) loam, grayish brown (10YR 5/2) moist; massive; hard, very friable, nonsticky and nonplastic; violently

effervescent; 5 percent gravel; moderately alkaline; abrupt wavy boundary.
Cr—10 to 14 inches; weakly cemented, calcareous sandstone.

Range in Characteristics

Depth to paralithic contact: 10 to 18 inches
Depth to calcareous material: 0 to 6 inches
Content of rock fragments: 0 to 20 percent

A horizon:
Hue—10YR
Value—4 to 6 dry, 3 to 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam or gravelly loam
Fine-earth fraction—12 to 20 percent clay
Calcium carbonate equivalent—0 to 10 percent
Reaction—slightly alkaline or moderately alkaline

AC horizon:
Hue—10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam or gravelly loam
Calcium carbonate equivalent—1 to 10 percent
Reaction—moderately alkaline

C horizon:
Hue—10YR
Value—6 to 8 dry, 5 or 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—gravelly loam or loam
Range of calcium carbonate—1 to 10 percent
Reaction—moderately alkaline

Colby Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills, plains, and interfluves
Parent material: Loess
Slope range: 0 to 25 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 48 to 51 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine-silty, mixed, superactive, calcareous, mesic Aridic Ustorthents

Typical Pedon

Colby silt loam, in an area of Norka-Colby silt loams, 5 to 15 percent slopes, about 2,120 feet south and 75 feet east of the northwest corner of sec. 14, T. 6 S., R. 45 W.; USGS Idalia, Colorado, SW, topographic quadrangle; lat. 39 degrees 31 minutes 39 seconds N. and long. 102 degrees 23 minutes 53 seconds W.

A—0 to 3 inches; brown (10YR 5/3) silt loam, dark grayish brown (10YR 4/2) moist; weak very fine granular structure; loose, very friable, slightly sticky and slightly plastic; common very fine and fine roots; slightly effervescent; moderately alkaline; clear smooth boundary.
AC—3 to 8 inches; light yellowish brown (10YR 6/4) silt loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; slightly effervescent; moderately alkaline; clear smooth boundary.
C1—8 to 30 inches; very pale brown (10YR 7/4) silt loam, brown (10YR 5/3) moist; massive; hard, very friable, slightly sticky and slightly plastic; few fine roots; few fine carbonate threads; violently effervescent; moderately alkaline; gradual smooth boundary.
C2—30 to 60 inches; very pale brown (10YR 7/4) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to calcareous material: 0 to 4 inches
Calcium carbonate equivalent: 5 to 10 percent
Other features: Some pedons do not have an AC horizon.

A horizon:
Hue—10YR
Value—5 to 7 dry, 3 to 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or silty clay loam
Fine-earth fraction—15 to 32 percent clay

AC or C horizon:
Hue—10YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam
Fine-earth fraction—18 to 27 percent clay

Concordia Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow

Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 48 to 51 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Fine, smectitic, mesic Typic Natrustalfs

Typical Pedon

Concordia loam, 0 to 2 percent slopes, rarely flooded, about 2,825 feet north and 1,550 feet east of the southwest corner of sec. 13, T. 6 S., R. 46 W.; USGS Idalia, Colorado, SW, topographic quadrangle; lat. 39 degrees 31 minutes 17 seconds N. and long. 102 degrees 29 minutes 38 seconds E.

A—0 to 2 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2), rubbed, moist; weak thin platy structure parting to moderate fine granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine and common fine and medium roots; electrical conductivity 1.0 mmho/cm; slightly effervescent; moderately alkaline; clear smooth boundary.

Btn1—2 to 6 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2), rubbed, moist; strong fine columnar structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine to medium roots; few fine tubular pores; electrical conductivity 3.1 mmhos/cm; many distinct continuous clay films on faces of peds; slightly effervescent; very strongly alkaline; clear smooth boundary.

Btn2—6 to 13 inches; brown (10YR 5/3) clay, brown (10YR 4/3), rubbed, moist; strong medium columnar structure parting to strong medium subangular blocky; very hard, extremely firm, very sticky and very plastic; common very fine to medium roots; few fine tubular pores; electrical conductivity 5.0 mmhos/cm; sodium adsorption ratio 70; many distinct continuous clay films on faces of peds; slightly effervescent; very strongly alkaline; clear smooth boundary.

Btn3—13 to 24 inches; pale brown (10YR 6/3) clay, brown (10YR 5/3), rubbed, moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; very hard, very firm, very sticky and very plastic; common very fine to medium roots; many very fine and fine tubular pores; electrical conductivity 4.7 mmhos/cm; sodium adsorption ratio 70; common distinct clay films on faces of peds; strongly effervescent; very strongly alkaline; gradual smooth boundary.

Btkn—24 to 38 inches; light brownish gray (10YR 6/2) clay, brown (10YR 5/3), rubbed, moist; weak medium prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine to medium roots; many very fine and fine tubular pores; electrical conductivity 2.5 mmhos/cm; sodium adsorption ratio 22; common distinct clay films on faces of peds; many fine and medium irregular soft masses of lime; slightly effervescent; very strongly alkaline; gradual smooth boundary.

Btk—38 to 47 inches; light brownish gray (10YR 6/2) clay loam, brown (10YR 4/3) moist; common medium distinct olive brown (2.5Y 4/4 moist) mottles; weak medium prismatic structure parting to weak medium subangular blocky; hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; many very fine and fine tubular pores; electrical conductivity 1.3 mmhos/cm; common distinct clay films on faces of peds; common fine and medium irregular soft masses of lime; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—47 to 56 inches; pale brown (10YR 6/3) silty clay, brown (10YR 4/3), rubbed, moist; common fine and medium distinct olive brown (2.5Y 4/4 moist) mottles; weak medium subangular blocky structure; very hard, very firm, moderately sticky and moderately plastic; few very fine and fine roots; many very fine and fine tubular pores; electrical conductivity 1.2 mmhos/cm; distinct pressure faces on faces of peds; common fine and medium irregular soft masses of lime; slightly effervescent; moderately alkaline; gradual smooth boundary.

Bk2—56 to 80 inches; light brownish gray (10YR 6/2) silty clay, brown (10YR 4/3), rubbed, and gray (5Y 5/1) moist; common fine and medium prominent olive (5Y 4/4 moist) irregular mottles; massive; very hard, very firm, moderately sticky and moderately plastic; few very fine and fine roots; common very fine and fine tubular pores; electrical conductivity 0.8 mmho/cm; common fine irregular soft masses of lime and common fine carbonate threads; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 47 to 66 inches
Depth to the top of the natric horizon: 2 to 20 inches
Depth to the base of the natric horizon: 32 to 63 inches
Particle-size control section: Clay or clay loam averaging 35 to 50 percent clay

Content of rock fragments: 0 to 10 percent gravel
Depth to mottling: 38 to 60 inches
Depth to calcareous material: 0 to 5 inches
Sodium adsorption ratio: 15 to 70
Other features: A C or Ck horizon in some pedons

A horizon:
Hue—10YR
Value—3 to 5 dry, 2 or 3 moist
Chroma—2 or 3 dry, 1 or 2 moist
Texture of the fine-earth fraction—loam
Fine-earth fraction—13 to 26 percent clay
Reaction—slightly alkaline or moderately alkaline
Electrical conductivity—0.4 to 2.0 mmhos/cm

Btn and Btkn horizons:
Hue—10YR or 2.5Y
Value—4 to 6 dry, 3 to 5 moist
Chroma—1 to 3
Texture of the fine-earth fraction—clay or clay loam
Fine-earth fraction—35 to 50 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—strongly alkaline or very strongly alkaline
Sodium adsorption ratio—22 to 70
Electrical conductivity—0.9 to 6.0 mmhos/cm

Btk and Bk horizons:
Hue—10YR or 2.5Y
Value—5 or 6 dry, 4 or 5 moist
Chroma—1 to 3
Texture of the fine-earth fraction—loam, clay loam, silty clay
Fine-earth fraction—22 to 42 percent clay
Calcium carbonate equivalent—5 to 10 percent
Reaction—moderately alkaline or strongly alkaline
Electrical conductivity—0.4 to 2.0 mmhos/cm

Dwyer Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Landform: Dunes
Parent material: Eolian sand
Slope range: 1 to 45 percent
Average annual precipitation: 15 to 16 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Mixed, mesic Ustic Torripsamments

Typical Pedon

Dwyer fine sand is included in an area of Valent loamy sand, 5 to 15 percent slopes. The type location for the series is 200 feet south and 100 feet west of the northeast corner of SE¼NE¼ of sec. 26, T. 22 N., R. 61 W., Goshen County, Wyoming.

A—0 to 6 inches; pale brown (10YR 6/3) fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose; moderately alkaline; gradual smooth boundary.
C—6 to 60 inches; very pale brown (10YR 7/3) fine sand, grayish brown (10YR 5/2) moist; single grain; loose; moderately alkaline.

Range in Characteristics

A horizon:
Hue—10YR
Value—5 to 7 dry, 3 to 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loamy sand or fine sand
Reaction—slightly alkaline to strongly alkaline

C horizon:
Hue—10YR
Value—5 to 7 dry, 3 to 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—fine sand or loamy fine sand
Reaction—moderately alkaline or strongly alkaline

Eckley Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills and plains
Parent material: Eolian material over alluvium
Slope range: 1 to 20 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Aridic Argiustolls

Typical Pedon

Eckley gravelly sandy loam, in an area of Eckley-Wages complex, 4 to 20 percent slopes, about 275 feet north and 1,000 feet east of the southwest corner of sec. 33, T. 11 S., R. 51 W.; USGS Bellyache Creek, Colorado, topographic quadrangle; lat. 39 degrees 2 minutes 22 seconds N. and long. 103 degrees 7 minutes 18 seconds W.

A—0 to 4 inches; brown (10YR 5/3) gravelly sandy

loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; 15 percent gravel; neutral; abrupt smooth boundary.

Bt—4 to 12 inches; brown (10YR 4/3) gravelly sandy clay loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few fine tubular pores; few faint clay films on faces of peds; 25 percent gravel; neutral; clear smooth boundary.

BC—12 to 15 inches; brown (10YR 4/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; 30 percent gravel; slightly alkaline; clear smooth boundary.

2C1—15 to 22 inches; yellowish brown (10YR 5/4) gravelly sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; 35 percent gravel; slightly alkaline; gradual wavy boundary.

2C2—22 to 60 inches; brown (10YR 5/3) gravelly sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; 15 percent gravel; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 9 to 15 inches
Depth to the base of the argillic horizon: 9 to 12 inches
Depth to contrasting gravelly or very gravelly sand: 12 to 20 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam or gravelly sandy loam
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—4 to 6 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—gravelly sandy clay loam or sandy clay loam
Reaction—neutral or slightly alkaline

2C horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—3 or 4
Texture of the fine-earth fraction—gravelly sand, very gravelly sand, or gravelly loamy sand
Reaction—neutral or slightly alkaline
Other features—lime in some pedons

Fort Collins Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills and plains
Parent material: Eolian material over alluvium
Slope range: 1 to 9 percent
Average annual precipitation: 13 to 16 inches
Average annual air temperature: 47 to 49 degrees F
Frost-free period: 145 to 148 days
Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical Pedon

Fort Collins loam, 1 to 3 percent slopes, about 1,950 feet north and 1,420 feet west of the southeast corner of sec. 36, T. 11 S., R. 51 W.; USGS Bellyache Creek, Colorado, topographic quadrangle; lat. 39 degrees 2 minutes 42 seconds N. and long. 103 degrees 3 minutes 19 seconds W.

A—0 to 5 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; slightly alkaline; clear smooth boundary.

BA—5 to 9 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; slightly alkaline; clear smooth boundary.

Bt—9 to 19 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; few fine tubular pores; common distinct brown (10YR 4/3) clay films on faces of peds; slightly alkaline; gradual smooth boundary.

BCk—19 to 26 inches; light yellowish brown (10YR 6/4) clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few fine roots; common very fine and fine tubular pores; strongly effervescent; moderately alkaline; gradual smooth boundary.

Ck—26 to 60 inches; light gray (10YR 7/2) loam, yellowish brown (10YR 5/4) moist; massive; soft, friable, slightly sticky and slightly plastic; few fine

roots; common very fine and fine tubular pores; few fine soft masses of carbonate; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to the base of the argillic horizon: 11 to 20 inches
Depth to calcareous material: 10 to 20 inches

A horizon:
Hue—10YR
Value—5 to 7 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Fine-earth fraction—15 to 22 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—clay loam
Fine-earth fraction—27 to 33 percent clay
Reaction—neutral or slightly alkaline

Bk or C horizon:
Hue—10YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—clay loam or loam
Fine-earth fraction—25 to 31 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline or strongly alkaline

Glenberg Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 4 percent
Average annual precipitation: 14 to 17 inches
Average annual air temperature: 48 to 51 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents

Typical Pedon

Glenberg fine sandy loam, in an area of Glenberg, rarely flooded-Bankard, occasionally flooded, complex, 0 to 3 percent slopes, about 1,850 feet south and 1,890 feet east of the northwest corner of sec. 17, T. 7 S., R. 44 W.; USGS Burlington, Colorado, NE, topographic quadrangle; lat. 39 degrees 26 minutes 29 seconds N. and long. 102 degrees 20 minutes 43 seconds W.

A—0 to 4 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; slightly alkaline; clear smooth boundary.
AC—4 to 13 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; slightly effervescent; moderately alkaline; gradual smooth boundary.
C1—13 to 21 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; strongly effervescent; 1 percent gravel; strongly alkaline; gradual smooth boundary.
C2—21 to 60 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; slightly effervescent; 5 percent gravel; moderately alkaline.

Range in Characteristics

Depth to calcareous material: 0 to 5 inches
Other features: Some pedons do not have an AC horizon.

A horizon:
Hue—10YR
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 to 4
Texture of the fine-earth fraction—fine sandy loam or sandy loam
Fine-earth fraction—10 to 18 percent clay
Calcium carbonate equivalent—0 to 3 percent
Reaction—slightly alkaline or moderately alkaline
Other features—a buried A horizon in some pedons

C horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—fine sandy loam, sandy loam, loamy sand
Fine-earth fraction—8 to 18 percent clay
Calcium carbonate equivalent—1 to 10 percent
Reaction—moderately alkaline or strongly alkaline

Goshen Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate

Landform: Drainageways
Parent material: Alluvium
Slope range: 0 to 2 percent
Average annual precipitation: 14 to 17 inches
Average annual air temperature: 45 to 51 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine-silty, mixed, superactive, mesic Pachic Argiustolls

Typical Pedon

Goshen silt loam, 0 to 2 percent slopes, rarely flooded, about 1,900 feet north and 2,400 feet west of the southeast corner of sec. 26, T. 7 S., R. 43 W.; USGS Kanorado, Colorado, NW, topographic quadrangle; lat. 39 degrees 23 minutes 29 seconds N. and long. 102 degrees 10 minutes 26 seconds W.

A1—0 to 4 inches; brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; slightly alkaline; abrupt smooth boundary.

A2—4 to 19 inches; brown (10YR 4/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine prismatic structure parting to moderate fine and medium granular; slightly hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; slightly alkaline; gradual smooth boundary.

Bt1—19 to 32 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; few faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—32 to 45 inches; brown (10YR 5/3) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; very hard, firm, slightly sticky and slightly plastic; few very fine roots; common very fine and fine tubular pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; slightly alkaline; gradual smooth boundary.

Bt3—45 to 52 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; few very fine roots; common fine tubular pores; few faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

BCk—52 to 60 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine roots; few fine rounded carbonate threads; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 22 to 45 inches
Depth to the base of the argillic horizon: 37 to more than 60 inches
Depth to calcareous material: 37 to 52 inches
Other features: A buried Btk horizon in some pedons

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam
Fine-earth fraction—21 to 26 percent clay
Reaction—neutral or slightly alkaline
Other features—a buried A horizon in some pedons

Bt horizon:
Hue—10YR
Value—4 or 5 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or silty clay loam
Fine-earth fraction—24 to 33 percent clay
Reaction—neutral or slightly alkaline

BCk or Bk horizon:
Hue—10YR
Value—6 to 8 dry, 4 to 6 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or loam
Fine-earth fraction—20 to 26 percent clay
Calcium carbonate equivalent—0 to 5 percent

Haverson Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 1 percent
Average annual precipitation: 14 to 17 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustifluvents

Typical Pedon

Haverson loam, 0 to 1 percent slopes, occasionally flooded, about 2,100 feet south and 72 feet east of the northwest corner of sec. 27, T. 13 S., R. 42 W.

Ap—0 to 5 inches; light brownish gray (10YR 6/2) loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; slightly alkaline; abrupt smooth boundary.

C1—5 to 14 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; slightly alkaline; clear smooth boundary.

C2—14 to 60 inches; pale brown (10YR 6/3), stratified loam, clay loam, and sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; moderately alkaline.

Range in Characteristics

Control section:

Texture—stratified loam, clay loam, and sandy loam
Clay content—18 to 35 percent
Silt content—10 to 50 percent
Sand content—20 to 60 percent
Content of fine sand or coarser sand—more than 15 percent but less than 35 percent

A horizon:

Hue—10YR
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Fine-earth fraction—10 to 27 percent clay
Calcium carbonate equivalent—0 to 5 percent
Reaction—slightly alkaline or moderately alkaline
Note—Where the value of the A horizon is as dark as 5 dry and 3 moist, the horizon is too thin, even after mixing, to meet the requirements for a mollic epipedon.

C horizon:

Hue—10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—stratified loam, clay loam, and sandy loam
Fine-earth fraction—18 to 35 percent clay
Calcium carbonate equivalent—1 to 15 percent
Reaction—slightly alkaline to strongly alkaline

Haxtun Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Plains
Parent material: Eolian material
Slope range: 0 to 3 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Fine-loamy, mixed, superactive, mesic Pachic Argiustolls

Typical Pedon

Haxtun sandy loam, in an area of Ascalon-Haxtun sandy loams, 0 to 3 percent slopes, about 1,800 feet south and 2,500 feet east of the northwest corner of sec. 17, T. 6 S., R. 47 W.; USGS Joes, Colorado, topographic quadrangle; lat. 39 degrees 31 minutes 45 seconds N. and long. 102 degrees 40 minutes 35 seconds W.

A—0 to 9 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; neutral; gradual smooth boundary.

BA—9 to 24 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; slightly alkaline; clear smooth boundary.

Btb1—24 to 30 inches; brown (10YR 5/3) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly alkaline; clear wavy boundary.

Btb2—30 to 40 inches; very dark grayish brown (10YR 3/2) sandy clay loam, very dark brown (10YR 2/2) moist; strong medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; common fine roots; common distinct very dark brown (10YR 2/2) clay films on faces of peds; slightly alkaline; gradual wavy boundary.

Bkb—40 to 48 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist;

strong medium prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; few very fine roots; slightly alkaline; gradual wavy boundary.

BC—48 to 58 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; soft, very friable, nonsticky and nonplastic; slightly alkaline; gradual wavy boundary.

C—58 to 72 inches; pale brown (10YR 6/3) loamy sand, dark grayish brown (10YR 4/2) moist; massive; soft, loose, nonsticky and nonplastic; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 28 to 47 inches
Depth to the base of the argillic horizon: 28 to 48 inches
Depth to calcareous material: 28 to 60 inches

A horizon:
Hue—10YR
Value—4 or 5 dry
Chroma—2 or 3
Texture of the fine-earth fraction—sandy loam or loamy sand
Fine-earth fraction—2 to 19 percent clay

Btb horizon:
Hue—10YR
Value—3 to 5 dry, 2 or 3 moist
Chroma—1 to 3
Texture of the fine-earth fraction—clay loam or sandy clay loam
Fine-earth fraction—20 to 35 percent clay
Reaction—neutral or slightly alkaline

C horizon:
Hue—10YR
Value—6 or 7 dry, 4 to 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—sandy loam, loam, loamy sand
Fine-earth fraction—8 to 23 percent clay
Calcium carbonate equivalent—0 to 15 percent
Reaction—slightly alkaline or moderately alkaline

Iliff Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Landform: Plains
Parent material: Loess over cemented, calcareous sandstone
Slope range: 0 to 2 percent
Average annual precipitation: 13 to 15 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 148 to 150 days
Taxonomic classification: Fine, smectitic, mesic Aridic Paleustolls

Typical Pedon

Iliff silt loam, 0 to 2 percent slopes, about 125 feet north and 1,950 feet east of the southwest corner of sec. 33, T. 10 S., R. 45 W.; USGS Rock Creek, Colorado, topographic quadrangle; lat. 39 degrees 7 minutes 43 seconds N. and long. 102 degrees 26 minutes 18 seconds W.

A1—0 to 6 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; slightly alkaline; clear smooth boundary.

A2—6 to 9 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure parting to moderate fine granular; soft, friable, slightly sticky and slightly plastic; common very fine roots; slightly alkaline; abrupt smooth boundary.

Bt1—9 to 15 inches; brown (10YR 4/3) silty clay, very dark grayish brown (10YR 3/2) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine roots; few fine tubular pores; many distinct very dark grayish brown (10YR 3/2) clay films; slightly alkaline; clear smooth boundary.

Bt2—15 to 20 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; strong medium prismatic structure parting to moderate medium angular blocky; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; common distinct dark grayish brown (10YR 4/2) clay films; moderately alkaline; clear smooth boundary.

Bk1—20 to 25 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; few fine rounded soft masses of lime; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bk2—25 to 31 inches; light brownish gray (10YR 6/2) clay loam, brown (10YR 5/3) moist; massive; slightly hard, firm, moderately sticky and

moderately plastic; few very fine roots; common fine soft masses of carbonate; strongly effervescent; 5 percent gravel; moderately alkaline; gradual smooth boundary.

BCk—31 to 36 inches; light gray (10YR 7/2) clay loam, pale brown (10YR 6/3) moist; massive; slightly hard, firm, moderately sticky and moderately plastic; common fine irregular soft masses of carbonate; violently effervescent; 5 percent gravel; moderately alkaline.

R—36 to 40 inches; cemented, calcareous sandstone.

Range in Characteristics

Thickness of the mollic epipedon: 8 to 15 inches
Depth to the base of the argillic horizon: 11 to 20 inches
Depth to bedrock: 23 to 36 inches
Other features: A C horizon in some pedons

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay loam or silty clay
Fine-earth fraction—35 to 50 percent clay

Bk horizon:
Hue—10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay loam or clay loam
Fine-earth fraction—30 to 40 percent clay
Calcium carbonate equivalent—5 to 15 percent

BCk horizon:
Hue—10YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—2 or 3
Texture of the fine-earth fraction—clay loam
Fine-earth fraction—30 to 35 percent clay
Content of rock fragments—0 to 5 percent gravel
Calcium carbonate equivalent—5 to 15 percent

Julesburg Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Hills and plains
Parent material: Eolian material
Slope range: 1 to 9 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Aridic Argiustolls

Typical Pedon

Julesburg sandy loam, 1 to 3 percent slopes, about 900 feet south and 1,800 feet east of the northwest corner of sec. 26, T. 6 S., R. 47 W.; USGS Stratton, Colorado, NW, topographic quadrangle; lat. 39 degrees 24 minutes 53 seconds N. and long. 102 degrees 37 minutes 39 seconds W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; neutral; clear smooth boundary.

BA—5 to 12 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; neutral; gradual smooth boundary.

Bt—12 to 30 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; very few faint clay films on faces of peds and clay bridged between sand grains; slightly alkaline; gradual smooth boundary.

BC—30 to 42 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; very few faint clay films on faces of peds and clay bridged between sand grains; slightly alkaline; clear smooth boundary.

C—42 to 60 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 8 to 12 inches
Depth to the base of the argillic horizon: 14 to 34 inches
Depth to calcareous material: 55 to more than 60 inches

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

Texture of the fine-earth fraction—sandy loam or loamy sand
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 to 4
Texture of the fine-earth fraction—sandy loam
Fine-earth fraction—12 to 16 percent clay
Reaction—neutral or slightly alkaline

C horizon:
Hue—10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—loamy sand or sandy loam
Fine-earth fraction—2 to 12 percent clay
Reaction—slightly alkaline

Keith Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Plains and interfluves
Parent material: Loess
Slope range: 0 to 3 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 48 to 51 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Fine-silty, mixed, superactive, mesic Aridic Argiustolls

Typical Pedon

Keith silt loam, in an area of Kuma-Keith silt loams, 0 to 2 percent slopes, about 750 feet south and 1,300 feet west of the northeast corner of sec. 31, T. 11 S., R. 42 W.; USGS Mount Sunflower, Colorado, SW, topographic quadrangle; lat. 39 degrees 3 minutes 32 seconds N. and long. 102 degrees 9 minutes 8 seconds W.

A—0 to 6 inches; brown (10YR 4/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure parting to weak fine and medium granular; soft, very friable, slightly sticky and slightly plastic; common very fine roots; neutral; clear smooth boundary.

Bt1—6 to 9 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; common faint clay films on faces of peds; neutral; clear smooth boundary.

Bt2—9 to 17 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; few very fine tubular pores; many faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Btk—17 to 24 inches; light brownish gray (10YR 6/2) silty clay loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few fine roots; few fine tubular pores; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—24 to 34 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine roots; common very fine and fine tubular pores; few fine irregular soft masses of carbonate; violently effervescent; moderately alkaline; clear smooth boundary.

Bk2—34 to 41 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine irregular soft masses of carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk3—41 to 47 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak fine prismatic structure parting to weak fine and medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine and fine tubular pores; few fine irregular carbonate threads; violently effervescent; moderately alkaline; clear smooth boundary.

C—47 to 60 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 9 to 19 inches
Depth to the base of the argillic horizon: 16 to 31 inches
Depth to calcareous material: 16 to 27 inches
Other features: Some pedons do not have a C horizon.

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

Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or very fine sandy loam
Fine-earth fraction—15 to 27 percent clay
Reaction—neutral

Bt horizon:
Hue—10YR
Value—4 to 6 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay loam or silt loam
Fine-earth fraction—20 to 35 percent clay
Reaction—neutral or slightly alkaline

Bk horizon:
Hue—10YR
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay loam, silt loam, loam
Fine-earth fraction—18 to 34 percent clay
Calcium carbonate equivalent—3 to 15 percent

C horizon:
Hue—10YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam, loam, very fine sandy loam
Fine-earth fraction—10 to 26 percent clay
Calcium carbonate equivalent—3 to 15 percent

Kimst Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills and plains
Parent material: Eolian material over alluvium
Slope range: 1 to 15 percent
Average annual precipitation: 13 to 16 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 150 days
Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents

Typical Pedon

Kimst sandy clay loam, in an area of Kimst-Wages sandy clay loams, 1 to 6 percent slopes, about 1,100 feet north and 1,300 feet west of the southeast corner of sec. 29, T. 11 S., R. 49 W.; USGS Big Spring Creek, Colorado, topographic quadrangle; lat. 39 degrees 3 minutes 25 seconds N. and long. 102 degrees 54 minutes 38 seconds W.

Ap—0 to 5 inches; light brownish gray (10YR 6/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; slightly hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; strongly effervescent; slightly alkaline; clear smooth boundary.
AC—5 to 12 inches; brown (10YR 5/3) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure; slightly hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; few very fine vesicular pores; violently effervescent; moderately alkaline; gradual wavy boundary.
C—12 to 60 inches; very pale brown (10YR 7/3) sandy clay loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; few very fine roots; common very fine vesicular pores; violently effervescent; moderately alkaline.

Range in Characteristics

Content of organic matter: 0.5 to 2.0 percent in the Ap horizon

A horizon:
Hue—10YR
Value—5 to 7 dry, 3 to 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—sandy clay loam, loam, clay loam
Fine-earth fraction—21 to 31 percent clay
Content of rock fragments—0 to 5 percent gravel
Calcium carbonate equivalent—5 to 15 percent
Reaction—slightly alkaline or moderately alkaline

C horizon:
Hue—10YR or 7.5YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—3 to 6
Texture of the fine-earth fraction—loam, clay loam, sandy clay loam
Fine-earth fraction—20 to 35 percent clay
Content of rock fragments—0 to 10 percent gravel
Calcium carbonate equivalent—5 to 15 percent

Kitcarson Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent

Average annual precipitation: 15 to 17 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Coarse-loamy, mixed, superactive, calcareous, mesic Oxyaquic Ustifluvents

Typical Pedon

Kitcarson loam, 0 to 2 percent slopes, rarely flooded, about 350 feet north and 350 feet west of the southeast corner of sec. 35, T. 5½ S., R. 44 W.; USGS Idalia, Colorado, SW, topographic quadrangle; lat. 39 degrees 33 minutes 53 seconds N. and long. 102 degrees 15 minutes 39 seconds W.

Ap1—0 to 6 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; slightly effervescent; moderately alkaline; gradual smooth boundary.

Ap2—6 to 15 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine vesicular pores; slightly effervescent; moderately alkaline; gradual smooth boundary.

C1—15 to 22 inches; pale brown (10YR 6/3) loam, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and slightly plastic; few very fine roots; common very fine vesicular pores; slightly effervescent; moderately alkaline; clear smooth boundary.

C2—22 to 28 inches; grayish brown (10YR 5/2) silt loam, dark grayish brown (10YR 4/2) moist; few fine faint and common fine yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine and fine vesicular pores; slightly effervescent; moderately alkaline; abrupt smooth boundary.

C3—28 to 34 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate fine subangular blocky; hard, firm, slightly sticky and slightly plastic; few very fine roots; common very fine and fine vesicular pores; slightly effervescent; moderately alkaline; clear smooth boundary.

C4—34 to 46 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; few and common fine yellowish brown (10YR 5/6) mottles; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; slightly effervescent; moderately alkaline; gradual smooth boundary.

C5—46 to 60 inches; light yellowish brown (10YR 6/4) sand, brown (10YR 5/3) moist; few fine faint mottles; single grain; loose, nonsticky and nonplastic; slightly effervescent; moderately alkaline.

Range in Characteristics

Depth to the water table: 22 to 36 inches from March through September in most years
Content of organic matter: 0.5 to 2.0 percent in the surface layer and decreasing irregularly with depth; in areas where the moist value and chroma are as dark as 3/3, the horizon is too thin or contains too little organic carbon to meet the requirements for a mollic epipedon.

Ap horizon:
Hue—10YR
Value—5 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Fine-earth fraction—16 to 21 percent clay
Calcium carbonate equivalent—5 to 10 percent

C horizon:
Hue—10YR
Value—4 to 7 dry, 3 to 5 moist
Chroma—1 to 4
Texture of the fine-earth fraction—loam, silt loam, clay loam, fine sandy loam, sandy loam, and sand but averages less than 18 percent clay in the particle-size control section
Calcium carbonate equivalent—5 to 15 percent

Kuma Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Plains
Parent material: Loess
Slope range: 0 to 3 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 48 to 51 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Fine-silty, mixed, superactive, mesic Pachic Argiustolls

Typical Pedon

Kuma silt loam (fig. 10), in an area of Kuma-Keith silt

loams, 0 to 2 percent slopes, about 1,750 feet south and 750 feet east of the northwest corner of sec. 9, T. 11 S., R. 42 W.; USGS Mount Sunflower, Colorado-Kansas, topographic quadrangle; lat. 39 degrees 6 minutes 51 seconds N. and long. 102 degrees 7 minutes 35 seconds W.

A—0 to 5 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine roots; neutral; clear smooth boundary.

BAt—5 to 9 inches; brown (10YR 4/3) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; few very fine tubular pores; few faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt1—9 to 16 inches; brown (10YR 4/3) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; common very fine roots; common very fine tubular pores; many faint and few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—16 to 19 inches; brown (10YR 5/3) silty clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine tubular pores; common faint and few distinct dark brown (10YR 3/3) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Btkb1—19 to 24 inches; dark grayish brown (10YR 4/2) silty clay loam, black (10YR 2/1) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine tubular pores; common faint and few distinct clay films on faces of peds; slightly effervescent; moderately alkaline; clear smooth boundary.

Btkb2—24 to 34 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine tubular pores; few faint clay films on faces of peds; few fine irregular carbonate threads; strongly effervescent; moderately alkaline; gradual smooth boundary.

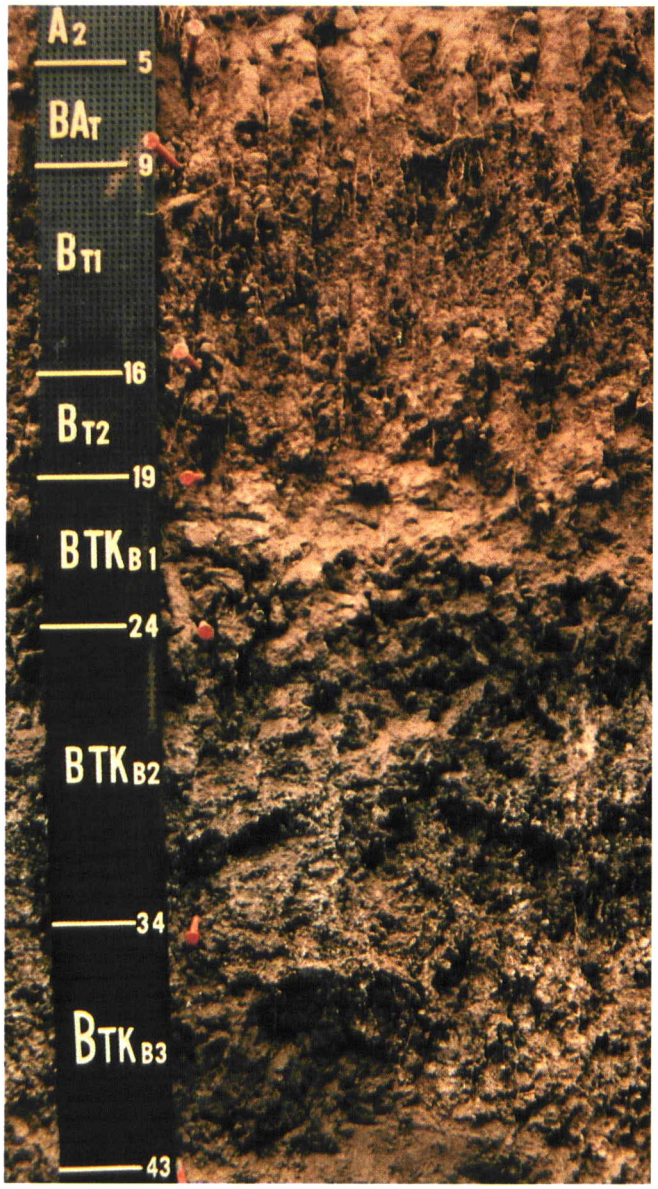

Figure 10.—Profile of Kuma silt loam showing polygenetic solums in which a younger soil superimposes and merges with a paleosol.

Btkb3—34 to 43 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; common faint clay films on faces of peds; many medium irregular soft masses of carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Bkb1—43 to 56 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard,

friable, slightly sticky and slightly plastic; many medium irregular soft masses of carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Bkb2—56 to 61 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many medium irregular soft masses of carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 23 to 41 inches
Depth to the base of the argillic horizon: 29 to 51 inches
Depth to calcareous material: 10 to 40 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or very fine sandy loam
Fine-earth fraction—14 to 27 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—3 to 5 dry, 2 or 3 moist
Chroma—1 to 3
Texture of the fine-earth fraction—silty clay loam, silt loam, loam
Fine-earth fraction—20 to 35 percent clay
Reaction—neutral or slightly alkaline

Btkb horizon:
Hue—10YR
Value—4 to 6 dry, 2 to 5 moist
Chroma—1 to 3
Texture of the fine-earth fraction—silty clay loam, silt loam, loam
Fine-earth fraction—25 to 35 percent clay
Calcium carbonate equivalent—1 to 10 percent

Bkb horizon:
Hue—10YR
Value—5 to 7 dry, 4 to 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam, loam
Fine-earth fraction—10 to 25 percent clay
Calcium carbonate equivalent—1 to 10 percent

Las Animas Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately rapid
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent
Average annual precipitation: 15 to 16 inches
Average annual air temperature: 49 to 51 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Coarse-loamy, mixed, superactive, calcareous, mesic Typic Fluvaquents

Typical Pedon

Las Animas sandy loam is included in an area of Oxyaquic Ustifluvents, occasionally flooded. The type location for the series is 2,640 feet south of the northwest corner of sec. 6, T. 23 S., R. 51 W., Bent County, Colorado.

A—0 to 6 inches; gray (N 5/0) sandy loam, dark gray (N 4/0) moist; moderate fine granular structure; soft, very friable; strongly effervescent; moderately alkaline; clear smooth boundary.

ACg—6 to 10 inches; light brownish gray (2.5Y 6/2) sandy loam stratified with loamy sand to loam, grayish brown (2.5Y 5/2) moist; common medium prominent yellowish brown (10YR 5/4) mottles; weak coarse subangular blocky structure parting to weak fine granular; slightly hard, very friable; strongly effervescent; moderately alkaline; gradual smooth boundary.

Cg—10 to 60 inches; light brownish gray (2.5Y 6/2) sandy loam stratified with loamy sand to loam, grayish brown (2.5Y 5/2) moist; many coarse prominent light olive brown (2.5Y 5/6 moist) and (N 5/0 moist) mottles; massive; soft, very friable; carbonate concretions and masses of carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to calcareous material: 0 to 10 inches
Electrical conductivity: 2 to 15 millimhos per centimeter

A horizon:
Hue—N
Value—4 to 6 dry, 3 or 4 moist
Chroma—0 to 2
Texture of the fine-earth fraction—fine sandy loam or sandy loam

C horizon:
Hue—2.5Y
Value—3 to 7 dry, 5 or 6 moist
Chroma—1 to 3
Texture of the fine-earth fraction—stratified loamy sand to loam

Lodgepole Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landform: Depressions
Parent material: Loess
Slope range: 0 to 1 percent
Average annual precipitation: 14 to 17 inches
Average annual air temperature: 47 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine, smectitic, mesic Typic Argiaquolls

Typical Pedon

Lodgepole silty clay loam, 17 miles north and 4 miles east of Benkelman, Nebraska; 2,500 feet east and 750 feet north of the southwest corner of sec. 24, T. 4 N., R. 37 W.; lat. 40 degrees 17 minutes 40 seconds N. and long. 101 degrees 26 minutes 46 seconds W.

Ap—0 to 5 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; weak fine granular structure; slightly hard, friable; many very fine roots; slightly acid; abrupt smooth boundary.

Bt1—5 to 9 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; strong fine and medium angular blocky structure; very hard, very firm; many very fine roots; patchy clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—9 to 24 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; strong coarse prismatic structure parting to strong fine subangular blocky; very hard, very firm; few very fine roots; patchy clay films on faces of peds; few fine brown (7.5YR 4/4) masses of iron accumulation throughout; slightly acid; diffuse wavy boundary.

Bt3—24 to 38 inches; dark grayish brown (10YR 4/2) silty clay, very dark brown (10YR 2/2) moist; strong coarse prismatic structure parting to moderate fine and medium subangular blocky; very hard, very firm; patchy clay films on faces of peds; common fine brown (7.5YR 4/4) masses of iron accumulation throughout; neutral; clear wavy boundary.

Bt4—38 to 45 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; organic coats on faces of peds; neutral; gradual wavy boundary.

BC—45 to 54 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; organic coats on faces of peds; neutral; gradual wavy boundary.

C—54 to 80 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 4/3) moist; massive; soft, very friable; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 20 to 50 inches
Depth to carbonates: 30 to more than 60 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay loam

Bt horizon:
Hue—10YR
Value—3 to 5 dry, 2 to 4 moist
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay loam or silty clay

C horizon:
Hue—10YR
Value—5 to 8 dry, 4 to 7 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam
Reaction—slightly alkaline

Manter Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Hills and plains
Parent material: Eolian material
Slope range: 1 to 15 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Aridic Argiustolls

Typical Pedon

Manter sandy loam, in an area of Manter-Ascalon sandy loams, 5 to 15 percent slopes, about 625 feet north and 180 feet west of the southeast corner of sec. 31, T. 10 S., R. 48 W.; USGS South of Seibert, Colorado, topographic quadrangle; lat. 39 degrees 7 minutes 43 seconds N. and long. 102 degrees 48 minutes 3 seconds W.

Ap—0 to 6 inches; brown (10YR 4/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable,

nonsticky and nonplastic; slightly alkaline; clear smooth boundary.

BA—6 to 9 inches; brown (10YR 4/3) sandy loam, dark brown (10YR 3/3) moist; weak coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; 2 percent gravel; slightly alkaline; clear smooth boundary.

Bt1—9 to 22 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to weak medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few faint clay bridges; 2 percent gravel; slightly alkaline; gradual smooth boundary.

Bt2—22 to 40 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few faint clay bridges; 2 percent gravel; slightly alkaline; clear smooth boundary.

Bk—40 to 60 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine irregular nodules and threads of carbonate; violently effervescent; 2 percent gravel; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 9 to 16 inches
Depth to the base of the argillic horizon: 25 to 40 inches
Depth to calcareous material: 25 to 40 inches
Other features: A C horizon in some pedons

Ap horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—sandy loam or loamy sand
Fine-earth fraction—5 to 20 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—4 or 5 dry, 3 or 4 moist
Chroma—2 to 4
Texture of the fine-earth fraction—sandy loam
Fine-earth fraction—12 to 18 percent clay
Reaction—neutral or slightly alkaline

Bk horizon:
Hue—10YR or 7.5YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—3 or 4
Texture of the fine-earth fraction—dominantly sandy loam but ranges to loamy sand in some pedons
Fine-earth fraction—5 to 15 percent clay
Calcium carbonate equivalent—5 to 15 percent

Manzanst Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Drainageways
Parent material: Alluvium
Slope range: 1 to 3 percent
Average annual precipitation: 14 to 16 inches
Average annual air temperature: 45 to 48 degrees F
Frost-free period: 145 to 148 days
Taxonomic classification: Fine, smectitic, mesic Aridic Haplustalfs

Typical Pedon

Manzanst clay loam, 1 to 3 percent slopes, rarely flooded, about 725 feet south and 175 feet west of the northeast corner of sec. 23, T. 9 S., R. 51 W.; USGS Flagler, Colorado, topographic quadrangle; lat. 39 degrees 15 minutes 23 seconds N. and long. 103 degrees 3 minutes 42 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to moderate fine and medium granular; hard, firm, very sticky and very plastic; common very fine and fine pores; slightly effervescent; moderately alkaline; clear smooth boundary.

Bt—3 to 12 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; moderate fine prismatic structure parting to moderate medium subangular blocky; extremely hard, extremely firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; slightly effervescent; moderately alkaline; clear smooth boundary.

Btk—12 to 37 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; moderate medium and coarse columnar structure parting to moderate medium angular blocky; extremely hard, extremely firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine irregular carbonate threads; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—37 to 52 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; weak coarse columnar structure parting to moderate medium and coarse subangular blocky; extremely hard, extremely firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; few faint clay films on faces of peds; common fine and medium irregular carbonate threads and soft masses of carbonate; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk2—52 to 60 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; weak medium prismatic structure; extremely hard, extremely firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; common fine and medium irregular carbonate threads and soft masses of carbonate; slightly effervescent; moderately alkaline.

Range in Characteristics

Depth to the base of the Bt horizon: 12 to 21 inches

A horizon:
- Hue—10YR
- Value—4 to 6 dry, 3 to 5 moist
- Chroma—2 or 3
- Organic carbon—1 to 2 percent in the upper 4 inches; does not meet the requirements for a mollic epipedon
- Texture of the fine-earth fraction—clay loam
- Fine-earth fraction—27 to 35 percent clay
- Calcium carbonate equivalent—5 to 10 percent
- Reaction—slightly alkaline or moderately alkaline

Bt horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry, 4 or 5 moist
- Chroma—2 or 3
- Texture of the fine-earth fraction—dominantly clay but can include clay loam or silty clay loam
- Fine-earth fraction—35 to 50 percent clay
- Calcium carbonate equivalent—5 to 10 percent
- Reaction—slightly alkaline or moderately alkaline

Bk or C horizon:
- Hue—10YR
- Value—5 to 7 dry, 4 to 6 moist
- Chroma—2 or 3
- Texture of the fine-earth fraction—dominantly clay but can include clay loam or silty clay loam
- Fine-earth fraction—30 to 45 percent clay
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—moderately alkaline or strongly alkaline

Midway Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Slow
Landform: Hills
Parent material: Residuum derived from shale
Slope range: 5 to 15 percent
Average annual precipitation: 13 to 15 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 148 days
Taxonomic classification: Clayey, smectitic, calcareous, mesic, shallow Ustic Torriorthents

Typical Pedon

Midway clay loam, 5 to 15 percent slopes, in an area of Midway-Razor clay loams, 5 to 15 percent slopes, about 100 feet north and 1,000 feet east of the southwest corner of sec. 30, T. 10 S., R. 51 W.; USGS East of Sevenmile Ranch, Colorado, topographic quadrangle; lat. 39 degrees 8 minutes 34 seconds N. and long. 103 degrees 9 minutes 5 seconds W.

A—0 to 4 inches; brown (10YR 4/3) clay loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; slightly hard, friable, moderately sticky and moderately plastic; common very fine roots; strongly effervescent; shale channers and 2 percent gravel; moderately alkaline; clear smooth boundary.

C—4 to 15 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; massive; hard, firm, very sticky and very plastic; few very fine roots; violently effervescent; moderately alkaline; clear wavy boundary.

Cr—15 to 19 inches; soft shale.

Range in Characteristics

Depth to weathered shale: 10 to 20 inches

A horizon:
- Hue—10YR or 2.5Y
- Value—4 to 6 dry, 4 or 5 moist
- Chroma—3 or 4
- Texture of the fine-earth fraction—clay loam
- Fine-earth fraction—30 to 40 percent clay
- Reaction—moderately alkaline

C horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry
- Chroma—3 or 4

Texture of the fine-earth fraction—clay or clay loam
Fine-earth fraction—35 to 45 percent clay

Norka Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills, plains, and interfluves
Parent material: Loess
Slope range: 0 to 9 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 47 to 51 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine-silty, mixed, superactive, mesic Aridic Argiustolls

Typical Pedon

Norka silt loam (fig. 11), 0 to 3 percent slopes, about 1,950 feet south and 2,250 feet east of the northwest corner of sec. 9, T. 11 S., R. 42 W.; USGS Mount Sunflower, Colorado-Kansas, topographic quadrangle; lat. 39 degrees 6 minutes 48 seconds N. and long. 102 degrees 7 minutes 17 seconds W.

A—0 to 5 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine roots; slightly alkaline; clear smooth boundary.

Bt—5 to 13 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; common very fine roots; few very fine tubular pores; many faint clay films on faces of peds; slightly alkaline; gradual smooth boundary.

Bk1—13 to 28 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; common fine and medium irregular soft masses of carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bk2—28 to 39 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; few fine irregular carbonate threads; violently effervescent; moderately alkaline; gradual smooth boundary.

C1—39 to 49 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine tubular pores; strongly effervescent; moderately alkaline.

C2—49 to 67 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; strongly effervescent; moderately alkaline.

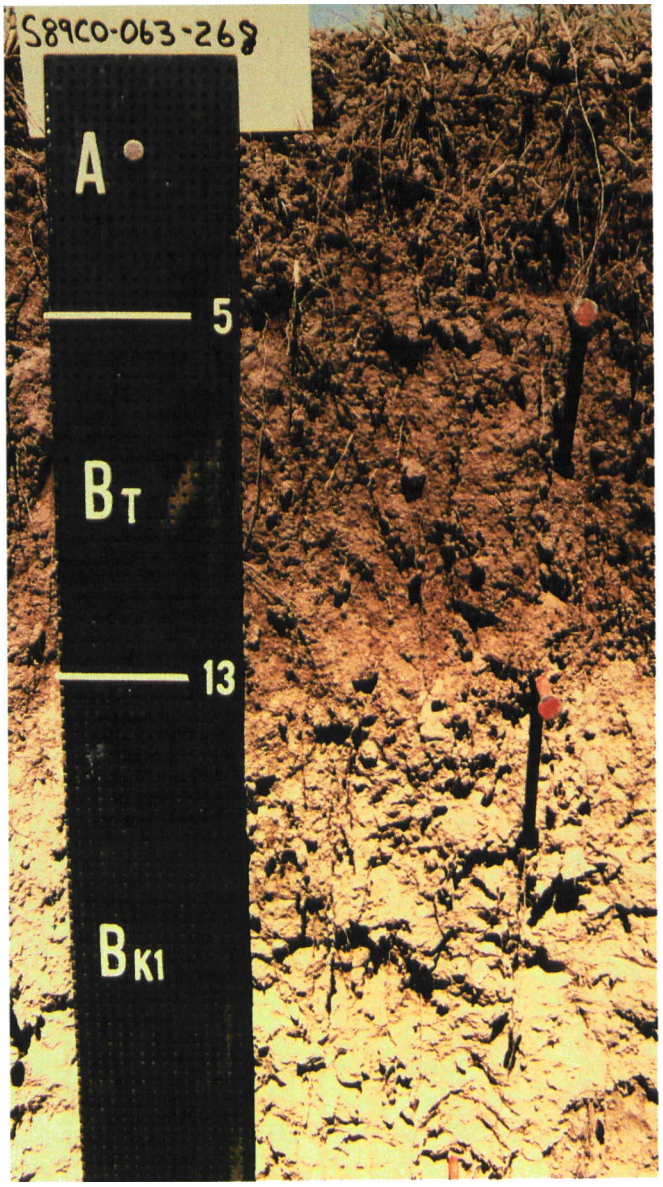

Figure 11.—Profile of Norka silt loam showing a thin Bt horizon.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 13 inches
Depth to the base of the argillic horizon: 9 to 15 inches
Depth to calcareous material: 9 to 14 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam
Fine-earth fraction—18 to 25 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—4 or 5 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or silty clay loam
Fine-earth fraction—25 to 34 percent clay
Reaction—neutral or slightly alkaline

Bk horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or silty clay loam
Fine-earth fraction—22 to 32 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline

C horizon:
Hue—10YR
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam or loam
Fine-earth fraction—18 to 26 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline

Nunn Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Upland terraces
Parent material: Alluvium
Slope range: 1 to 4 percent
Average annual precipitation: 13 to 16 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 145 to 150 days
Taxonomic classification: Fine, smectitic, mesic Aridic Argiustolls

Typical Pedon

Nunn clay loam, 1 to 4 percent slopes, eroded, about 1,550 feet south and 150 feet east of the northwest corner of sec. 19, T. 10 S., R. 49 W.; USGS South of Seibert, Colorado, topographic quadrangle; lat. 39 degrees 10 minutes 2 seconds N. and long. 102 degrees 55 minutes 48 seconds W.

Ap—0 to 5 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to moderate medium granular; soft, friable, moderately sticky and moderately plastic; common very fine roots; slightly alkaline; abrupt smooth boundary.

Bt—5 to 11 inches; dark yellowish brown (10YR 4/4) clay, dark brown (10YR 3/3) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; many distinct dark brown (10YR 3/3) clay films on faces of peds; slightly alkaline; clear wavy boundary.

Bk1—11 to 17 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; few fine irregular soft masses of carbonate; moderately alkaline; clear smooth boundary.

Bk2—17 to 23 inches; very pale brown (10YR 7/3) sandy clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; few fine irregular soft masses of carbonate; moderately alkaline; clear smooth boundary.

C1—23 to 50 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and slightly plastic; strongly effervescent; moderately alkaline; gradual smooth boundary.

C2—50 to 60 inches; very pale brown (10YR 7/3) sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 17 to 37 inches
Depth to calcareous material: 10 to 18 inches

Ap horizon:
Hue—10YR

Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—clay loam or sandy clay loam
Fine-earth fraction—27 to 32 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—4 or 5 dry, 2 to 4 moist
Chroma—2 to 4
Texture of the fine-earth fraction—clay or clay loam
Fine-earth fraction—35 to 45 percent clay
Reaction—slightly alkaline

Bk or C horizon:
Hue—10YR
Value—6 or 7 dry, 4 to 6 moist
Chroma—3 or 4
Texture of the fine-earth fraction—clay loam, sandy clay loam, sandy loam
Fine-earth fraction—10 to 40 percent clay
Calcium carbonate equivalent—4 to 15 percent
Reaction—moderately alkaline or strongly alkaline

Olnest Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills and plains
Parent material: Eolian material over alluvium
Slope range: 1 to 9 percent
Average annual precipitation: 13 to 15 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 150 days
Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical Pedon

Olnest sandy loam, 1 to 6 percent slopes, about 220 feet north and 2,440 feet east of the southwest corner of sec. 21, T. 10 S., R. 50 W.; USGS South of Flagler Reservoir, Colorado, topographic quadrangle; lat. 39 degrees 9 minutes 26 seconds N. and long. 102 degrees 59 minutes 45 seconds W.

A—0 to 4 inches; brown (10YR 5/3) sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; slightly alkaline; clear smooth boundary.

BA—4 to 7 inches; brown (10YR 5/3) sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine tubular pores; 2 percent gravel; slightly alkaline; clear smooth boundary.

Bt—7 to 16 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; soft, friable, slightly sticky and slightly plastic; common fine tubular pores; few faint clay bridges between sand grains and few clay films on faces of peds; 2 percent gravel; slightly alkaline; clear smooth boundary.

Bk1—16 to 22 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; few very fine and fine pores; few carbonate concretions; strongly effervescent; 1 percent gravel; moderately alkaline; gradual smooth boundary.

Bk2—22 to 35 inches; very pale brown (10YR 7/3) sandy clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine tubular pores; common fine soft masses of carbonate; violently effervescent; strongly alkaline; gradual smooth boundary.

Bk3—35 to 49 inches; very pale brown (10YR 7/3) sandy clay loam, light yellowish brown (10YR 6/4) moist; massive; soft, friable, slightly sticky and slightly plastic; common very fine and fine pores; common fine soft masses of carbonate; violently effervescent; strongly alkaline; clear smooth boundary.

C—49 to 60 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; strongly effervescent; 10 percent gravel; strongly alkaline.

Range in Characteristics

Depth to the base of the argillic horizon: 16 to 23 inches
Depth to calcareous material: 12 to 23 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 3 or 4 moist
Chroma—2 to 4
Texture of the fine-earth fraction—sandy loam or sandy clay loam
Fine-earth fraction—10 to 26 percent clay
Content of rock fragments—0 to 5 percent gravel
Reaction—neutral or slightly alkaline
Note—Where the moist value and chroma of the

A horizon are as dark as 3/3, the horizon is too thin or contains too little organic carbon to meet the requirements for a mollic epipedon.

Bt horizon:
- Hue—10YR
- Value—4 to 6 dry, 4 or 5 moist
- Chroma—3 or 4
- Texture of the fine-earth fraction—sandy clay loam
- Fine-earth fraction—23 to 32 percent clay
- Content of rock fragments—0 to 5 percent gravel
- Reaction—neutral or slightly alkaline

Bk and C horizons:
- Hue—10YR
- Value—5 to 8 dry, 4 to 6 moist
- Chroma—2 to 4
- Texture of the fine-earth fraction—sandy loam, fine sandy loam, sandy clay loam, loam
- Fine-earth fraction—5 to 25 percent clay
- Content of rock fragments—0 to 10 percent gravel
- Calcium carbonate equivalent—4 to 15 percent
- Reaction—moderately alkaline or strongly alkaline

Otero Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Hills, plains, and blowouts
Parent material: Eolian material
Slope range: 1 to 20 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 49 to 51 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents

Typical Pedon

Otero fine sandy loam, 1 to 20 percent slopes, moist, about 40 feet north and 2,400 feet east of the southwest corner of sec. 1, T. 7 S., R. 46 W.; USGS Settlement, Colorado, topographic quadrangle; lat. 39 degrees 27 minutes 41 seconds N. and long. 102 degrees 29 minutes 29 seconds W.

A—0 to 6 inches; very pale brown (10YR 7/4) fine sandy loam, light yellowish brown (10YR 6/4) moist; moderate thick platy structure; soft, very friable, nonsticky and nonplastic; strongly effervescent; slightly alkaline; abrupt smooth boundary.

C—6 to 60 inches; very pale brown (10YR 7/4) loamy very fine sand, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to calcareous material: 0 to 6 inches

A horizon:
- Hue—10YR
- Value—5 to 7 dry, 3 to 6 moist
- Chroma—2 to 4
- Texture of the fine-earth fraction—fine sandy loam or sandy loam
- Fine-earth fraction—9 to 20 percent clay
- Reaction—slightly alkaline or moderately alkaline

C horizon:
- Hue—10YR
- Value—6 or 7 dry, 5 or 6 moist
- Chroma—3 or 4
- Texture of the fine-earth fraction—sandy loam, fine sandy loam, loamy very fine sand
- Fine-earth fraction—5 to 18 percent clay
- Calcium carbonate equivalent—1 to 5 percent
- Reaction—moderately alkaline

Oxyaquic Ustifluvents

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landform: Flood plains and drainageways
Parent material: Alluvium
Slope range: 0 to 1 percent
Average annual precipitation: 14 to 17 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Oxyaquic Ustifluvents

Typical Pedon

Oxyaquic Ustifluvents, occasionally flooded, about 2,750 feet south and 2,000 feet west of the northeast corner of sec. 8, T. 6 S., R. 45 W.; USGS Idalia, Colorado, SW, topographic quadrangle; lat. 39 degrees 32 minutes 35 seconds N. and long. 102 degrees 27 minutes 4 seconds W.

A—0 to 7 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium and thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; slightly effervescent; slightly alkaline; clear smooth boundary.

C1—7 to 11 inches; pale brown (10YR 6/3) fine sandy loam, dark grayish brown (10YR 4/2) moist;

massive; soft, friable, nonsticky and nonplastic; common fine roots; slightly effervescent; slightly alkaline; clear smooth boundary.

C2—11 to 30 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; common medium distinct brown (7.5YR 4/4) mottles; moderate medium and thick platy structure; soft, friable, nonsticky and nonplastic; common fine roots; slightly effervescent; slightly alkaline; clear smooth boundary.

C3—30 to 35 inches; light gray (10YR 7/2) sand, grayish brown (10YR 5/2) moist; common fine and medium distinct brown (7.5YR 4/4) mottles; single grain; loose, nonsticky and nonplastic; few very fine roots; slightly effervescent; slightly alkaline; clear smooth boundary.

C4—35 to 44 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; brown (7.5YR 4/4) and common medium prominent reddish brown (5YR 4/4) mottles; weak thin, medium, and thick platy structure; hard, firm, moderately sticky and moderately plastic; common fine and medium roots; slightly effervescent; slightly alkaline; clear smooth boundary.

C5—44 to 56 inches; dark gray (10YR 4/1) silty clay loam, very dark grayish brown (10YR 3/2) moist; brown (7.5YR 4/4) and common medium prominent reddish brown (5YR 4/4) mottles; massive; hard, firm, moderately sticky and moderately plastic; common fine and medium roots; slightly effervescent; moderately alkaline; clear smooth boundary.

Cg1—56 to 60 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; massive; hard, firm, very sticky and very plastic; common very fine roots; slightly effervescent; moderately alkaline; clear smooth boundary.

Cg2—60 to 62 inches; gray (10YR 5/1) coarse sand, dark gray (10YR 4/1) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; slightly effervescent; moderately alkaline.

Range in Characteristics

Depth to the water table: 0.5 foot to 1.5 feet from March to September in most years

A horizon:
Hue—10YR
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 to 4
Texture of the fine-earth fraction—loam
Fine-earth fraction—12 to 19 percent clay
Reaction—slightly alkaline or moderately alkaline
Note—Where the moist value and chroma of the A horizon are as dark as 3/3, the horizon is too thin or contains too little organic carbon to meet the requirements for a mollic epipedon.

C horizon:
Hue—10YR
Value—4 to 7 dry, 3 to 5 moist
Chroma—1 to 3
Texture of the fine-earth fraction—coarse sand, sand, fine sandy loam, very fine sandy loam, silty clay loam, and silty clay
Fine-earth fraction—2 to 42 percent clay
Calcium carbonate equivalent—5 to 10 percent
Reaction—slightly alkaline or moderately alkaline

Paoli Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Terraces
Parent material: Alluvium
Slope range: 0 to 2 percent
Average annual precipitation: 14 to 17 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Pachic Haplustolls

Typical Pedon

Paoli fine sandy loam, 0 to 2 percent slopes, rarely flooded, about 2,200 feet south and 450 feet east of the northwest corner of sec. 7, T. 6 S., R. 45 W.; USGS Idalia, Colorado, topographic quadrangle; lat. 39 degrees 35 minutes 35 seconds N. and long. 102 degrees 28 minutes 47 seconds W.

A1—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and medium roots; neutral; clear smooth boundary.

A2—6 to 14 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; few very fine vesicular and interstitial pores; neutral; gradual smooth boundary.

A3—14 to 28 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic;

common very fine and fine roots; few very fine and fine vesicular pores and few very fine interstitial pores; slightly alkaline; clear smooth boundary.

A4—28 to 34 inches; dark grayish brown (10YR 4/2) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; slightly alkaline; abrupt smooth boundary.

Bk1—34 to 44 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine and fine vesicular and interstitial pores; few fine irregular carbonate threads; moderately alkaline; clear smooth boundary.

Bk2—44 to 55 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine and fine vesicular pores and few very fine and fine interstitial pores; few fine irregular carbonate threads; moderately alkaline; clear smooth boundary.

Bk3—55 to 60 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common fine irregular carbonate threads; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 21 to 44 inches
Depth to calcareous material: 25 to 44 inches
Other features: A C horizon in some pedons

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—fine sandy loam or sandy loam
Fine-earth fraction—12 to 17 percent clay
Reaction—neutral or slightly alkaline

Bk horizon:
Hue—10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—sandy loam or fine sandy loam
Fine-earth fraction—10 to 18 percent clay
Calcium carbonate equivalent—4 to 10 percent
Reaction—moderately alkaline

Platner Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Plains
Parent material: Alluvium
Slope range: 0 to 3 percent
Average annual precipitation: 14 to 17 inches
Average annual air temperature: 47 to 50 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Fine, smectitic, mesic Aridic Paleustolls

Typical Pedon

Platner loam, 0 to 3 percent slopes, about 1,525 feet north and 1,320 feet east of the southwest corner of sec. 20, T. 6 S., R. 51 W.; USGS Thurman, Colorado, topographic quadrangle; lat. 39 degrees 30 minutes 34 seconds N. and long. 102 degrees 7 minutes 51 seconds W.

A—0 to 6 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate very fine and fine granular structure; soft, friable, slightly sticky and slightly plastic; common very fine roots; neutral; clear smooth boundary.

Bt1—6 to 11 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to strong medium subangular blocky; hard, very firm, very sticky and very plastic; common very fine and fine roots; few very fine and fine tubular pores; common distinct dark brown (10YR 3/3) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—11 to 20 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong fine prismatic structure parting to strong fine angular blocky; hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine and fine tubular pores; many distinct brown (10YR 4/3) clay films on faces of peds; 5 percent gravel; slightly alkaline; gradual smooth boundary.

Bk1—20 to 27 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine and fine tubular pores; common fine carbonate threads; violently effervescent; moderately alkaline; clear smooth boundary.

Bk2—27 to 37 inches; very pale brown (10YR 7/3) sandy clay loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine tubular pores; few fine carbonate threads; violently effervescent; moderately alkaline; gradual smooth boundary.

C—37 to 60 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; violently effervescent; strongly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 19 inches
Depth to the base of the argillic horizon: 14 to 30 inches
Depth to calcareous material: 14 to 24 inches
Other features: An E horizon in some pedons

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Fine-earth fraction—12 to 26 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—4 or 5 dry, 3 or 4 moist
Chroma—2 to 4
Texture of the fine-earth fraction—clay loam or clay
Fine-earth fraction—35 to 45 percent clay

Bk horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—loam, sandy clay loam, clay loam
Fine-earth fraction—23 to 34 percent clay
Calcium carbonate equivalent—5 to 15 percent

C horizon:
Hue—10YR
Value—6 or 7 dry, 4 to 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—sandy loam or sandy clay loam
Fine-earth fraction—15 to 25 percent clay
Calcium carbonate equivalent—5 to 10 percent
Reaction—moderately alkaline or strongly alkaline

Pleasant Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Landform: Shallow closed depressions
Parent material: Alluvium
Slope range: 0 to 1 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine, smectitic, mesic Torrertic Argiustolls

Typical Pedon

Pleasant silty clay loam, 0 to 1 percent slopes, about 1,200 feet north and 1,200 feet east of the southwest corner of sec. 6, T. 6 S., R. 50 W.; USGS Anton, Colorado, SE, topographic quadrangle; lat. 39 degrees 33 minutes 6 seconds N. and long. 103 degrees 2 minutes 13 seconds W.

A—0 to 5 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; strong very fine subangular blocky structure; very hard, very firm, moderately sticky and moderately plastic; common very fine and fine roots; few cracks 1/8 to 1/4 inch wide; neutral; clear smooth boundary.

BA—5 to 10 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; strong medium prismatic structure parting to strong medium subangular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots; few faint clay films on faces of peds; slightly alkaline; gradual smooth boundary.

Bt—10 to 47 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; strong fine and medium prismatic structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; few very fine and fine roots; few fine tubular pores; many distinct clay films on faces of peds; slightly alkaline; gradual smooth boundary.

BC1—47 to 56 inches; grayish brown (10YR 5/2) silty clay, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; slightly alkaline; gradual smooth boundary.

BC2—56 to 60 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; hard,

firm, moderately sticky and moderately plastic; few very fine roots; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 38 to 47 inches
Depth to the base of the argillic horizon: 30 to more than 60 inches
Depth to calcareous material: 50 to more than 60 inches
Other features: Some pedons do not have a 2C horizon.

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay loam
Fine-earth fraction—35 to 40 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—5 or 6 dry, 3 or 4 moist
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay, silty clay loam, clay
Fine-earth fraction—37 to 60 percent clay

BC horizon:
Hue—10YR
Value—5 to 7 dry
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay or silty clay loam
Fine-earth fraction—37 to 50 percent clay
Calcium carbonate equivalent—0 to 5 percent
Reaction—slightly alkaline or moderately alkaline

Rago Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Drainageways, plains, and interfluves
Parent material: Loess
Slope range: 0 to 2 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 47 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine, smectitic, mesic Pachic Argiustolls

Typical Pedon

Rago silt loam, in an area of Rago-Weld silt loams, 0 to 2 percent slopes, about 2,000 feet north and 250 feet east of the southwest corner of sec. 9, T. 6 S., R. 50 W.; USGS Cope, Colorado, SW, topographic quadrangle; lat. 39 degrees 5 minutes 11 seconds N. and long. 103 degrees 0 minutes 12 seconds W.

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; neutral; gradual smooth boundary.

Bt—4 to 22 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; many distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Btk—22 to 32 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to fine and medium subangular blocky; hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine tubular pores; few faint and distinct clay films on faces of peds; many fine and medium irregular carbonate threads and soft masses of carbonate; moderately alkaline; clear smooth boundary.

Btkb1—32 to 48 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; common distinct and faint clay films on faces of peds; common fine and medium irregular carbonate threads and soft masses of carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Btkb2—48 to 50 inches; brown (10YR 5/3) silty clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; common distinct and faint clay films on faces of peds; common fine and medium irregular carbonate threads and soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bkb—50 to 70 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very

fine tubular pores; common fine irregular carbonate threads and soft masses of carbonate; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 25 to 50 inches
Depth to the base of the argillic horizon: 24 to 60 inches
Depth to calcareous material: 22 to 40 inches

A horizon:
Hue—10YR
Value—4 or 5 dry
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam
Fine-earth fraction—18 to 25 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 to 3
Texture of the fine-earth fraction—silty clay or silty clay loam
Fine-earth fraction—35 to 41 percent clay
Reaction—neutral or slightly alkaline

Btkb horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 to 3
Texture of the fine-earth fraction—silty clay loam or silty clay
Fine-earth fraction—27 to 45 percent clay
Calcium carbonate equivalent—5 to 10 percent
Reaction—moderately alkaline

Bkb or C horizons:
Hue—10YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam, fine sandy loam, loam
Fine-earth fraction—15 to 26 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline

Razor Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Landform: Hills
Parent material: Residuum derived from shale
Slope range: 5 to 15 percent
Average annual precipitation: 13 to 15 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 148 days
Taxonomic classification: Fine, smectitic, mesic Ustic Haplocambids

Typical Pedon

Razor clay loam, in an area of Midway-Razor clay loams, 5 to 15 percent slopes, about 2,100 feet north and 310 feet west of the southeast corner of sec. 14, T. 9 S., R. 51 W.; USGS Flagler, Colorado, topographic quadrangle; lat. 39 degrees 15 minutes 51 seconds N. and long. 103 degrees 3 minutes 44 seconds W.

A—0 to 4 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate fine granular structure; slightly hard, friable, very sticky and very plastic; common very fine roots; slightly effervescent; moderately alkaline; clear smooth boundary.
Bw—4 to 10 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; weak fine prismatic structure parting to moderate fine and medium subangular blocky; very hard, firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; pressure faces on 90 percent of peds; few fine irregular soft masses of carbonate; slightly effervescent; moderately alkaline; clear smooth boundary.
BCky—10 to 25 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; moderate medium and coarse subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; many fine and medium irregular carbonate threads and soft masses of carbonate; moderately alkaline; clear smooth boundary.
Cr—25 to 29 inches; weathered shale.

Range in Characteristics

Depth to weathered shale: 25 to 38 inches
Other features: A C horizon in some pedons

A horizon:
Hue—10YR or 2.5Y
Value—3 to 6 dry, 3 to 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—clay loam
Fine-earth fraction—30 to 40 percent clay
Calcium carbonate equivalent—0 to 5 percent
Reaction—moderately alkaline or slightly alkaline

Bw or BCky horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4
Texture of the fine-earth fraction—clay, silty clay, clay loam
Fine-earth fraction—35 to 60 percent clay
Calcium carbonate equivalent—1 to 15 percent
Calcium sulfate—0 to 5 percent

Richfield Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Plains and interfluves
Parent material: Loess
Slope range: 0 to 3 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine, smectitic, mesic Aridic Argiustolls

Typical Pedon

Richfield silt loam, 0 to 2 percent slopes, about 2,200 feet north and 1,175 feet east of the southwest corner of sec. 4, T. 9 S., R. 42 W.; USGS Kanorado, Colorado, topographic quadrangle; lat. 39 degrees 17 minutes 42 seconds N. and long. 102 degrees 6 minutes 20 seconds W.

Ap—0 to 5 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable, nonsticky and slightly plastic; common very fine and fine roots; slightly alkaline; clear smooth boundary.
Bt—5 to 15 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to strong fine and medium subangular blocky; very hard, very firm, very sticky and very plastic; few very fine and fine roots; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly alkaline; clear smooth boundary.
Bk1—15 to 23 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; many fine carbonate threads; slightly effervescent; moderately alkaline; gradual smooth boundary.
Bk2—23 to 37 inches; very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few fine carbonate threads; violently effervescent; moderately alkaline; gradual smooth boundary.
C—37 to 60 inches; very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; strongly effervescent; strongly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 9 to 17 inches
Depth to the base of the argillic horizon: 8 to 18 inches
Depth to calcareous material: 10 to 18 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or silty clay loam
Fine-earth fraction—20 to 35 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—4 or 5 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay loam or silty clay
Fine-earth fraction—35 to 42 percent clay
Reaction—neutral or slightly alkaline

Bk horizon:
Hue—10YR
Value—6 or 7 dry, 4 to 6 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or silty clay loam
Fine-earth fraction—20 to 35 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline

C horizon:
Hue—10YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam, silty clay loam, clay loam
Fine-earth fraction—18 to 35 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline or strongly alkaline
Other features—Some pedons do not have a C horizon.

Sampson Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Drainageways and flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 47 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine-loamy, mixed, superactive, mesic Pachic Argiustolls

Typical Pedon

Sampson loam, in an area of Satanta-Sampson, rarely flooded, loams, 0 to 3 percent slopes, about 120 feet north and 120 feet west of the southeast corner of sec. 30, T. 11 S., R. 49 W.; USGS Big Spring Creek, Colorado, topographic quadrangle; lat. 39 degrees 3 minutes 16 seconds N. and long. 102 degrees 55 minutes 24 seconds W.

A—0 to 6 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak thin and thick platy structure parting to moderate fine granular; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; neutral; clear smooth boundary.

BA—6 to 10 inches; grayish brown (10YR 5/2) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; few faint clay films on faces of peds; neutral; clear smooth boundary.

Bt1—10 to 20 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; few faint clay films on faces of peds; 5 percent gravel; neutral; clear smooth boundary.

Bt2—20 to 29 inches; grayish brown (10YR 5/2) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots; few faint clay films on faces of peds; neutral; clear smooth boundary.

Bt3—29 to 38 inches; dark gray (10YR 4/1) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots; few faint clay films on faces of peds; neutral; clear wavy boundary.

BC—38 to 60 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; few fine roots; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 27 to 38 inches
Depth to the base of the argillic horizon: 24 to 38 inches
Depth to calcareous material: 24 to 38 inches
Other features: A Bk or C horizon in some pedons

A horizon:
- Hue—10YR
- Value—4 or 5 dry, 2 or 3 moist
- Chroma—2 or 3
- Texture of the fine-earth fraction—loam
- Fine-earth fraction—20 to 25 percent clay
- Reaction—neutral or slightly alkaline

Bt horizon:
- Hue—10YR
- Value—4 or 5 dry, 3 or 4 moist
- Chroma—1 to 3
- Texture of the fine-earth fraction—loam or clay loam
- Fine-earth fraction—24 to 35 percent clay
- Reaction—neutral or slightly alkaline

BC horizon:
- Hue—10YR
- Value—5 or 6 dry, 4 or 5 moist
- Chroma—2 or 3
- Texture of the fine-earth fraction—loam, sandy clay loam, clay loam
- Fine-earth fraction—15 to 30 percent clay
- Calcium carbonate equivalent—3 to 15 percent

Satanta Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Terraces, stream terraces, and plains
Parent material: Eolian material over alluvium
Slope range: 0 to 5 percent
Average annual precipitation: 14 to 17 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aridic Argiustolls

Typical Pedon

Satanta loam, 1 to 3 percent slopes, about 903 feet north and 30 feet east of the southwest corner of sec. 31, T. 10 S., R. 48 W.; USGS South of Seibert, Colorado, topographic quadrangle; lat. 39 degrees 7 minutes 47 seconds N. and long. 102 degrees 49 minutes 6 seconds W.

Ap—0 to 4 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots; neutral; clear smooth boundary.

AB—4 to 7 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; neutral; clear smooth boundary.

Bt1—7 to 14 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; very few faint clay films on faces of peds; 3 percent gravel; neutral; clear smooth boundary.

Bt2—14 to 19 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; few faint clay films on faces of peds; 3 percent gravel; neutral; clear smooth boundary.

Bt3—19 to 23 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; very few faint clay films on faces of peds; strongly effervescent; 5 percent gravel; slightly alkaline; clear smooth boundary.

Bk—23 to 34 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; few fine carbonate nodules; violently effervescent; 5 percent gravel; moderately alkaline; gradual smooth boundary.

C—34 to 60 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure; hard, friable, slightly sticky and slightly plastic; violently effervescent; 7 percent gravel; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 19 inches
Depth to the base of the argillic horizon: 16 to 32 inches
Depth to calcareous material: 16 to 32 inches
Content of rock fragments: 0 to 10 percent
Other features: Some pedons do not have an AB horizon. Some pedons have a BA horizon.

A horizon:
- Hue—10YR
- Value—4 or 5 dry, 2 or 3 moist
- Chroma—2 or 3
- Texture of the fine-earth fraction—loam or clay loam
- Fine-earth fraction—10 to 28 percent clay
- Reaction—neutral or slightly alkaline

Bt horizon:
- Hue—10YR
- Value—4 to 6 dry, 3 to 5 moist
- Chroma—2 to 4
- Texture of the fine-earth fraction—loam or clay loam
- Fine-earth fraction—25 to 35 percent clay
- Reaction—neutral or slightly alkaline

Bk horizon:
- Hue—10YR
- Value—5 or 6 dry, 4 or 5 moist
- Chroma—2 or 3
- Texture of the fine-earth fraction—loam, sandy clay loam, clay loam
- Fine-earth fraction—25 to 30 percent clay
- Calcium carbonate equivalent—3 to 15 percent
- Reaction—moderately alkaline

C horizon:
- Hue—10YR
- Value—6 or 7 dry, 4 to 6 moist
- Chroma—2 to 4
- Texture of the fine-earth fraction—loam, very fine sandy loam, fine sandy loam
- Fine-earth fraction—10 to 27 percent clay
- Calcium carbonate equivalent—4 to 15 percent

Stoneham Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills and plains
Parent material: Eolian material over alluvium
Slope range: 1 to 15 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 45 to 50 degrees F

Frost-free period: 145 to 152 days
Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical Pedon

Stoneham loam, in an area of Stoneham-Fort Collins loams, 3 to 5 percent slopes, about 1,820 feet north and 750 feet west of the southeast corner of sec. 36, T. 11 S., R. 51 W.; USGS Bellyache Creek, Colorado, topographic quadrangle; lat. 39 degrees 2 minutes 40 seconds N. and long. 103 degrees 3 minutes 13 seconds W.

A—0 to 3 inches; brown (10YR 5/3) loam, dark grayish brown (10YR 4/2) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; neutral; abrupt smooth boundary.

Bt—3 to 6 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; few fine pores; few faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Btk—6 to 10 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; few fine tubular pores; few faint patchy clay films on faces of peds; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—10 to 27 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; few fine soft masses of carbonate and carbonate threads; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk2—27 to 60 inches; very pale brown (10YR 7/3) loam, light yellowish brown (10YR 6/4) moist; massive; soft, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; few fine soft masses of carbonate and carbonate threads; strongly effervescent; strongly alkaline.

Range in Characteristics

Depth to the base of the argillic horizon: 6 to 11 inches
Depth to calcareous material: 3 to 10 inches

A horizon:
Hue—10YR
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Fine-earth fraction—16 to 24 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—clay loam, sandy clay loam, loam
Fine-earth fraction—22 to 31 percent clay
Reaction—neutral or slightly alkaline

Bk or C horizon:
Hue—10YR or 7.5YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—3 or 4
Texture of the fine-earth fraction—loam, clay loam, sandy clay loam
Fine-earth fraction—21 to 32 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline or strongly alkaline

Ulmet Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Plains
Parent material: Alluvium
Slope range: 1 to 3 percent
Average annual precipitation: 14 to 16 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 145 to 148 days
Taxonomic classification: Fine, smectitic, mesic Aridic Haplustalfs

Typical Pedon

Ulmet loam, in an area of Satanta-Ulmet loams, 1 to 3 percent slopes, about 105 feet south and 796 feet east of the northwest corner of sec. 16, T. 11 S., R. 49 W.; USGS Big Spring Creek, Colorado, topographic quadrangle; lat. 39 degrees 5 minutes 50 seconds N. and long. 102 degrees 54 minutes 1 second W.

A—0 to 4 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots; neutral; clear smooth boundary.

BAt—4 to 7 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; very few faint clay films on faces of peds; neutral; clear smooth boundary.

Bt1—7 to 12 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate fine and medium prismatic structure parting to moderate fine subangular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—12 to 17 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bk1—17 to 26 inches; pale brown (10YR 6/3) clay loam, light yellowish brown (10YR 6/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, firm, very sticky and very plastic; many very fine and fine roots; many carbonate nodules and carbonate threads; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bk2—26 to 37 inches; very pale brown (10YR 7/3) clay loam, light yellowish brown (10YR 6/4) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots; many fine pores; many carbonate nodules and soft masses of carbonate; violently effervescent; moderately alkaline; gradual smooth boundary.

Bk3—37 to 60 inches; light gray (10YR 7/2) clay loam, very pale brown (10YR 7/3) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; few fine roots; many fine pores; few fine carbonate nodules; violently effervescent; 2 percent gravel; moderately alkaline.

Range in Characteristics

Depth to the base of the argillic horizon: 17 to 24 inches
Depth to calcareous material: 13 to 24 inches
Other features: Some pedons do not have a BA horizon. Some pedons have a C horizon.

A horizon:
Hue—10YR
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam
Fine-earth fraction—18 to 25 percent clay
Reaction—neutral or slightly alkaline
Note—Where the moist value and chroma of the A horizon are as dark as 3/3, the horizon is too thin or contains too little organic carbon to meet the requirements for a mollic epipedon.

Bt horizon:
Hue—10YR
Value—4 to 6 dry, 4 or 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—clay loam or clay
Fine-earth fraction—35 to 45 percent clay
Reaction—neutral or slightly alkaline

Bk horizon:
Hue—10YR
Value—6 or 7 dry, 5 to 7 moist
Chroma—2 to 4
Texture of the fine-earth fraction—clay loam, sandy clay loam, loam
Fine-earth fraction—18 to 37 percent clay
Content of rock fragments—0 to 5 percent gravel
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline

Ulysses Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Plains
Parent material: Loess
Slope range: 1 to 3 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 48 to 51 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Fine-silty, mixed, superactive, mesic Aridic Haplustolls

Typical Pedon

Ulysses silt loam, 1 to 3 percent slopes, about 200 feet east and 100 feet south of the northwest corner of sec. 26, T. 13 S., R. 41 W.

A1—0 to 4 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable; many very fine roots; slightly alkaline; clear smooth boundary.

A2—4 to 10 inches; dark grayish brown (10YR 4/2) silt

loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, friable; many fine roots; slightly alkaline; gradual smooth boundary.

Bw—10 to 19 inches; grayish brown (10YR 5/2) silt loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, friable; many fine roots; strongly effervescent; moderately alkaline; gradual smooth boundary.

C—19 to 60 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; slightly hard, friable; few fine roots; few fine soft masses of carbonate and carbonate threads; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 10 to 24 inches
Depth to calcareous material: 7 to 15 inches
Thickness of the mollic epipedon: 7 to 12 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam
Reaction—neutral or slightly alkaline

Bw horizon:
Hue—10YR
Value—4 to 6 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or silty clay loam
Fine-earth fraction—21 to 32 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—slightly alkaline or moderately alkaline

C horizon:
Hue—10YR
Value—5 to 7 dry, 4 to 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam or loam
Fine-earth fraction—18 to 27 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline

Valent Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Landform: Dunes
Parent material: Eolian sand
Slope range: 1 to 45 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 48 to 50 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Mixed, mesic Ustic Torripsamments

Typical Pedon

Valent loamy sand, 5 to 15 percent slopes, about 550 feet south and 2,150 feet east of the northwest corner of sec. 20, T. 6 S., R. 47 W.; USGS Joes, Colorado, SW, topographic quadrangle; lat. 39 degrees 31 minutes 1 second N. and long. 102 degrees 40 minutes 40 seconds W.

A—0 to 9 inches; brown (10YR 4/3) loamy sand, very dark grayish brown (10YR 3/2) moist; single grain; loose, nonsticky and nonplastic; many very fine and common fine roots; slightly alkaline; gradual smooth boundary.

AC—9 to 14 inches; brown (10YR 4/3) loamy sand, dark brown (10YR 3/3) moist; single grain; loose, nonsticky and nonplastic; common very fine and fine roots; slightly alkaline; gradual smooth boundary.

C—14 to 60 inches; brown (10YR 5/3) loamy sand, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; slightly alkaline.

Range in Characteristics

Depth to calcareous material: 48 to more than 60 inches

A horizon:
Hue—10YR
Value—4 to 6 dry, 3 to 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—sand, fine sand, or loamy sand
Reaction—neutral or slightly alkaline
Organic carbon—less than 0.6 percent in the A and AC horizons

C horizon:
Hue—10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—loamy sand, fine sand, or sand
Reaction—slightly alkaline

Vona Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform: Hills

Parent material: Eolian material
Slope range: 3 to 15 percent
Average annual precipitation: 15 to 17 inches
Average annual air temperature: 47 to 50 degrees F
Frost-free period: 148 to 152 days
Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical Pedon

Vona fine sandy loam, 5 to 15 percent slopes, about 1,750 feet north and 2,450 feet east of the southwest corner of sec. 15, T. 6 S., R. 45 W.; USGS Idalia, Colorado, SW, topographic quadrangle; lat. 39 degrees 31 minutes 26 seconds N. and long. 102 degrees 25 minutes 0 seconds W.

Ap—0 to 5 inches; grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak thick platy structure parting to weak medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; common very fine roots; slightly alkaline; gradual smooth boundary.

BA—5 to 10 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak thick platy structure parting to moderate medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; common very fine roots; few very fine tubular pores; slightly alkaline; clear smooth boundary.

Bt—10 to 15 inches; brown (10YR 5/3) fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; common very fine roots; few fine interstitial pores; few faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Btk—15 to 25 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; few faint clay films on faces of peds; few fine irregular soft masses of carbonate; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—25 to 33 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; few fine irregular soft masses of carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bk2—33 to 42 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few fine and common very fine interstitial pores; common fine irregular soft masses of carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary.

C—42 to 61 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine interstitial pores; few fine irregular soft masses of carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to the base of the argillic horizon: 10 to 25 inches
Depth to calcareous material: 15 to 30 inches

A horizon:
- Hue—10YR
- Value—4 or 5 dry, 3 or 4 moist
- Chroma—2 or 3
- Texture of the fine-earth fraction—fine sandy loam or loamy sand
- Fine-earth fraction—10 to 15 percent clay
- Reaction—neutral or slightly alkaline

Bt horizon:
- Hue—10YR
- Value—5 or 6 dry, 4 or 5 moist
- Chroma—2 or 3
- Texture of the fine-earth fraction—fine sandy loam or sandy loam
- Fine-earth fraction—10 to 18 percent clay
- Reaction—slightly alkaline or moderately alkaline

Bk or C horizon:
- Hue—10YR
- Value—5 or 6 dry, 4 or 5 moist
- Chroma—2 or 3
- Texture of the fine-earth fraction—fine sandy loam, sandy loam, or loamy sand
- Fine-earth fraction—8 to 17 percent clay
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—moderately alkaline

Wages Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Hills and plains
Parent material: Eolian material over alluvium

Slope range: 0 to 15 percent
Average annual precipitation: 14 to 16 inches
Average annual air temperature: 47 to 51 degrees F
Frost-free period: 145 to 150 days
Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aridic Argiustolls

Typical Pedon

Wages loam, in an area of Eckley-Wages complex, 4 to 20 percent slopes, about 46 feet north and 1,810 feet west of the southeast corner of sec. 33, T. 6 S., R. 44 W.; USGS South of Burlington, Colorado, topographic quadrangle; lat. 39 degrees 28 minutes 29 seconds N. and long. 102 degrees 19 minutes 16 seconds W.

A—0 to 5 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots; 2 percent gravel; slightly alkaline; clear smooth boundary.

Bt—5 to 12 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bk—12 to 17 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and nonplastic; few very fine and fine roots; many very fine and fine tubular pores; few fine soft masses of carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

C—17 to 60 inches; very pale brown (10YR 7/3) loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine and fine roots; few very fine tubular pores; strongly effervescent; 5 percent gravel; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 9 to 14 inches
Depth to the base of the argillic horizon: 8 to 14 inches
Depth to calcareous material: 8 to 14 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam or sandy clay loam
Fine-earth fraction—18 to 25 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—4 or 5 dry, 3 to 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—loam, clay loam, sandy clay loam
Fine-earth fraction—25 to 33 percent clay
Reaction—slightly alkaline

Bk horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—sandy clay loam, clay loam, loam
Fine-earth fraction—20 to 30 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline

C horizon:
Hue—10YR
Value—5 to 7 dry, 5 or 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—sandy loam, loam, sandy clay loam
Fine-earth fraction—12 to 27 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline or strongly alkaline

Weld Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Interfluves and plains
Parent material: Loess
Slope range: 0 to 5 percent
Average annual precipitation: 13 to 17 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 152 days
Taxonomic classification: Fine, smectitic, mesic Aridic Paleustolls

Typical Pedon

Weld silt loam, 0 to 2 percent slopes, about 75 feet south and 900 feet east of the northwest corner of sec. 7, T. 11 S., R. 51 W.; USGS Bledsoe Ranch, Colorado, topographic quadrangle; lat. 39 degrees 6 minutes 36 seconds N. and long. 103 degrees 9 minutes 33 seconds W.

A—0 to 5 inches; grayish brown (10YR 5/2) silt loam, dark brown (10YR 3/3) moist; moderate medium

platy structure parting to weak very fine granular; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots; slightly alkaline; abrupt smooth boundary.

Bt1—5 to 12 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; strong fine prismatic structure parting to strong fine angular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—12 to 18 inches; grayish brown (10YR 5/2) silty clay, brown (10YR 4/3) moist; strong fine prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt3—18 to 28 inches; light brownish gray (10YR 6/2) silty clay loam, yellowish brown (10YR 5/4) moist; weak medium prismatic structure parting to moderate medium angular blocky; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; few faint yellowish brown (10YR 5/4) clay films on faces of peds; strongly effervescent; moderately alkaline; gradual smooth boundary.

C—28 to 60 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and slightly plastic; few very fine roots; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 19 inches
Depth to the base of the argillic horizon: 11 to 28 inches
Depth to calcareous material: 9 to 19 inches
Other features: A Bk horizon in some pedons

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam
Fine-earth fraction—19 to 25 percent clay
Reaction—neutral or slightly alkaline

Bt horizon:
Hue—10YR
Value—4 to 6 dry, 3 to 5 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silty clay or silty clay loam
Fine-earth fraction—35 to 45 percent clay
Calcium carbonate equivalent—0 to 10 percent
Reaction—neutral to moderately alkaline

C horizon:
Hue—10YR
Value—7 or 8 dry, 5 or 6 moist
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam or loam
Fine-earth fraction—16 to 27 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline or strongly alkaline

Wiley Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Plains
Parent material: Loess
Slope range: 0 to 3 percent
Average annual precipitation: 14 to 16 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 148 days
Taxonomic classification: Fine-silty, mixed, superactive, mesic Aridic Haplustalfs

Typical Pedon

Wiley silt loam, 0 to 3 percent slopes, about 150 feet south and 2,050 feet east of the northwest corner of sec. 22, T. 7 S., R. 56 W.; USGS T Draw, Colorado, topographic quadrangle; lat. 39 degrees 25 minutes 55 seconds N. and long. 103 degrees 38 minutes 27 seconds W.

Ap—0 to 4 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; slightly effervescent; moderately alkaline; clear smooth boundary.

Bt—4 to 10 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; slightly effervescent; moderately alkaline; clear smooth boundary.

Btk—10 to 18 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few medium soft masses of lime; violently effervescent; moderately alkaline; clear smooth boundary.

Bk—18 to 23 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium soft masses of lime; few faint clay films on faces of peds; violently effervescent; strongly alkaline; gradual smooth boundary.

C—23 to 60 inches; light yellowish brown (10YR 6/4) silt loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; violently effervescent; strongly alkaline.

Range in Characteristics

Depth to the base of the argillic horizon: 12 to 25 inches
Depth to calcareous material: 0 to 7 inches

A horizon:
Hue—10YR
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam
Fine-earth fraction—15 to 27 percent clay
Calcium carbonate equivalent—0 to 10 percent
Reaction—neutral to moderately alkaline

Bt horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay loam or silt loam
Fine-earth fraction—18 to 35 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline or strongly alkaline

Bk or C horizons:
Hue—10YR
Value—6 or 7 dry, 5 or 6 moist
Chroma—3 or 4
Texture of the fine-earth fraction—silt loam or silty clay loam
Fine-earth fraction—15 to 27 percent clay
Calcium carbonate equivalent—5 to 15 percent
Reaction—moderately alkaline or strongly alkaline

Formation of the Soils

This section relates the soils in the survey area to the major factors of soil formation and describes the system of soil classification. The acreage and proportionate extent of the soils in this survey area are shown in table 4, and the classification of the soils is shown in table 20.

A soil is a three-dimensional natural body consisting of mineral and organic material that can support plant growth. The characteristics of a soil at any given place are determined by the interactions among five factors of soil formation. Each of these factors affect the formation of every soil, and each modifies the effects of the other four. The effects of the individual factors vary from place to place. The interactions among the factors are more complex for some soils than for others. The five interacting soil-forming factors are the physical and mineralogical composition of the parent material; the climate under which the parent material has accumulated and existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time these forces have acted on the parent material.

Parent Material

Parent material is the unconsolidated material in which a soil forms. It influences the chemical and mineralogical properties of the soil as well as the physical characteristics, such as texture, color, consistence, and erodibility. The soils of Kit Carson County formed in three main types of parent material: alluvium, eolian material, and residuum.

Alluvium is material that has been transported and deposited by water. In Kit Carson County, soils have formed in both recent alluvium and old alluvial material. Recent alluvium is variable sandy material deposited on flood plains and stream terraces. Glenberg and Bankard soils formed in this type of parent material. Old alluvium is material derived from sedimentary rock of the Ogallala Formation. Platner, Nunn, and Ulmet soils formed in this type of parent material.

Eolian material is wind-deposited material. In Kit Carson County, Valent and Julesburg soils formed in sandy and mixed eolian material. Loess is silty, windblown material. Colby, Norka, Keith, Kuma, Weld, and Richfield soils in this county formed in loess.

Residuum is unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place. In Kit Carson County, Pierre Shale and Ogallala Sandstone are the two types of residuum in which soils formed. Canyon soils formed in residuum derived from the calcareous sandstone of the Ogallala Formation. Midway and Razor soils formed in clayey residuum derived from the soft shale of the Pierre Formation.

Climate

The climate in Kit Carson County is semiarid. It is characterized by extremes in temperature and precipitation. Winters are cold and dry, and summers are hot. Most of the 13- to 17-inch average annual precipitation falls in the period from March through August.

The amount of available water and its distribution relative to soil temperature and to periods of plant growth and biological activity have a great influence on soil formation.

Moisture moving downward through the soil leaches calcium carbonate from the surface horizon and deposits it in the subsoil. Clay particles are also transported from the upper horizons to the lower horizons.

The amount of available moisture also affects the amount and kind of vegetation and consequently the amount of organic matter in the soil. Stoneham, Ulmet, Olnest, and Fort Collins soils in the southwestern part of the county have less available moisture; therefore, they have less accumulation of organic matter in the surface layer.

Both soil blowing and water erosion inhibit the soil-forming processes. Soil blowing affects soil formation mainly by removal and deposition of surface layer material. Intense thundershowers increase the hazard of water erosion.

Freezing and thawing also influence soil formation, especially soil structure.

Plant and Animal Life

The vegetaton under which a soil forms influences soil properties, such as color, structure, reaction, and content and distribution of organic matter. The types of plant cover and animal life are determined by other soil-forming factors, mainly climate.

Most of the soils in Kit Carson County formed under native prairie grasses. The root system of perennial grasses contributes to the accumulation of organic matter in the upper part of the soil. Decomposed organic matter has darkened the upper part of the soil and has influenced the development of soil structure. Rago, Kuma, Weld, Sampson, and Satanta soils in Kit Carson County are examples of soils that have a dark surface horizon. Sandy soils and soils that have steeper slopes and increased runoff have less moisture and sparse vegetation, resulting in less organic matter and a light colored surface horizon. Also, areas of the county that have less rainfall have less accumulation of organic matter. Stoneham, Kimst, Colby, Otero, and Valent soils are examples of soils that have less organic matter and a light colored surface horizon.

Bacteria, fungi, and many other micro-organisms decompose organic matter and release nutrients to growing plants.

Earthworms, insects, prairie dogs, gophers, and badgers mix soil and create small channels that influence soil aeration and percolation of water. Earthworms feed on organic matter and help mix soil material. Wormcasts improve soil fertility.

Relief

Relief is the change in elevation or inequalities of a land surface. It affects the formation of soils by its influence on runoff, organic matter content, and erosion. If the other factors of soil formation are constant, an increase in slope results in increased runoff and erosion and slower profile development.

The steeper slopes have a more rapid rate of runoff and are most susceptible to soil erosion, resulting in a minimum of leaching. The sloping Colby and Kimst soils are less developed and are more susceptible to soil erosion, resulting in a minimum of leaching. Level soils have less runoff, resulting in greater leaching and less erosion. They generally have a thicker surface horizon, more organic matter, and a more developed subsoil. The level Keith, Richfield, Weld, Kuma, and Satanta soils have a well developed subsoil and a thicker, darker surface horizon.

Time

Time is necessary for soils to form from parent material. Soils in Kit Carson County have been developing for thousands of years. The length of time needed for a soil to develop depends upon the other factors of soil formation. Soils that developed from similar materials of the same age may vary because of differences in erosion, relief, and moisture. The age of soil is indicated by the depth to lime, the structure, and profile development. Young soils do not have the distinct genetic horizons that are in a more mature soil. Thousands of years are required for a B horizon to develop. The accumulation of organic matter in the surface layer also requires a long time. Alluvial soils, such as Bankard soils, that have recent deposition and very weak profile development are considered young soils. Leached soils that have strong structure and a dark surface horizon, such as Platner, Weld, and Richfield soils, are considered more mature.

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Glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

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.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Association, soil. A group of soils 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

Backfilling. The process of refilling a ditch or other excavation with soil material.

Backslope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Backslopes in profile are commonly steep, are linear, and may or may not include cliff segments.

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.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or 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 more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds directly beneath the solum, or it is exposed at the surface by erosion.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Canyon. A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

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 film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 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 is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is more than 60 percent.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil 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 are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

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.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

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.

Coppice dune. A small dune of fine grained soil material stabilized around shrubs or small trees.

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.

Cropping system. Growing crops according to a planned system of rotation and management practices.

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.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Desert pavement. On a desert surface, a layer of gravel or larger fragments that was emplaced by upward movement of the underlying sediment or that remains after finer particles have been removed by running water or the wind.

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.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Electrical conductivity (EC). Conductivity of electricity through water or an extract of soil; can be used to estimate the soluble salts in solution.

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.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (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 pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill 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. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess salt (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (or 300 meters) and fringes a mountain range or high-plateau escarpment.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

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.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon 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) granular, 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 horizon. 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.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

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.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

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.

Lime-induced chlorosis. An abnormal yellowing of plant foliage, caused by excess lime and/or low levels of iron or zinc.

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. Fine grained material, dominantly of silt-sized particles, deposited by wind.

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.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

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. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

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. Mottling generally indicates poor aeration and impeded drainage. 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.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

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.

Outwash plain. A landform of mainly sandy or coarse

textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Paleoterrace. An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water 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:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

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.

Post and piling outlet. A market location where posts and pilings are bought, processed, and sold.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range 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 range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in 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:

Extremely acid	below 4.5
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

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salty water (in tables). Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through

the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the substratum. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

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 position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site class. A grouping of site indexes into five to seven production capability levels. Each level can be represented by a site curve.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

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 (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil material. Soil or portions of soil that have been

displaced or mixed by either natural or mechanical means.

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 substratum. 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 which provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing 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. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

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 about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Tailwater. In hydraulics, the water directly downstream from a dam or similar structure.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms 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.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

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.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Burlington, Colorado)

Month	Temperature						Precipitation				
				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 lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	42.7	16.7	29.7	70	-12	29	0.29	0.13	0.54	1	4.3
February	47.3	20.6	33.9	74	-8	52	0.32	0.11	0.58	1	2.7
March	54.4	26.0	40.2	81	2	135	0.87	0.16	1.42	2	5.4
April	64.7	35.5	50.1	87	15	324	1.25	0.71	1.81	3	3.5
May	73.3	45.0	59.2	92	28	585	2.93	1.65	4.06	5	0.2
June	84.4	55.1	69.8	102	40	886	2.28	0.99	3.38	4	0.0
July	90.2	60.9	75.6	103	48	1,087	2.12	1.05	3.05	4	0.0
August	87.3	58.9	73.1	101	46	1,020	1.95	0.85	2.89	3	0.0
September	78.8	50.0	64.4	97	31	721	1.26	0.31	2.08	2	0.0
October	68.1	38.4	53.3	89	21	418	0.83	0.25	1.42	2	0.7
November	53.1	26.8	39.9	77	5	116	0.50	0.23	0.84	1	2.2
December	43.7	18.7	31.2	72	-10	37	0.30	0.11	0.58	1	3.7
Yearly:											
Average	65.7	37.7	51.7	---	---	---	---	---	---	---	---
Extreme	107	-23	---	105	-17	---	---	---	---	---	---
Total	---	---	---	---	---	5,410	14.89	9.61	17.55	29	22.6

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Burlington, Colorado)

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--	Apr. 24	May 5	May 17
2 years in 10 later than--	Apr. 20	Apr. 30	May 13
5 years in 10 later than--	Apr. 10	Apr. 19	May 5
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 4	Oct. 1	Sept. 20
2 years in 10 earlier than--	Oct. 11	Oct. 7	Sept. 26
5 years in 10 earlier than--	Oct. 24	Oct. 18	Oct. 8

Table 3.--Growing Season

(Recorded for the period 1961-90 at Burlington, Colorado)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	169	156	130
8 years in 10	178	165	139
5 years in 10	196	182	156
2 years in 10	214	199	173
1 year in 10	223	207	181

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
1	Ascalon sandy loam, 1 to 3 percent slopes	8,147	0.6
2	Ascalon sandy loam, 3 to 5 percent slopes	10,742	0.8
3	Ascalon sandy loam, 5 to 9 percent slopes	5,018	0.4
4	Ascalon fine sandy loam, 1 to 3 percent slopes	685	*
5	Ascalon loam, 1 to 3 percent slopes	3,481	0.3
6	Ascalon loam, 3 to 5 percent slopes	2,589	0.2
7	Ascalon loam, 5 to 15 percent slopes	2,847	0.2
8	Ascalon-Eckley loams, 1 to 5 percent slopes	1,229	*
9	Ascalon-Haxtun sandy loams, 0 to 3 percent slopes	11,672	0.8
10	Bayard fine sandy loam, 2 to 6 percent slopes	50	*
11	Beckton silt loam, 1 to 6 percent slopes	231	*
12	Bethune silty clay loam, 0 to 2 percent slopes	623	*
13	Canyon gravelly loam, 3 to 15 percent slopes	2,807	0.2
14	Canyon-Rock outcrop complex, 5 to 60 percent slopes	7,421	0.5
15	Colby silt loam, 1 to 3 percent slopes	18,383	1.3
16	Colby silt loam, 3 to 5 percent slopes	32,355	2.3
17	Colby silt loam, 5 to 15 percent slopes	28,185	2.0
18	Colby silt loam, dry, 3 to 12 percent slopes	184	*
19	Colby silty clay loam, dry, 1 to 3 percent slopes	3,671	0.3
20	Colby-Aridic Ustorthents complex, 9 to 25 percent slopes, gullied	1,595	0.1
21	Concordia loam, 0 to 2 percent slopes, rarely flooded	490	*
22	Eckley-Wages complex, 4 to 20 percent slopes	12,401	0.9
23	Fort Collins loam, 1 to 3 percent slopes	6,109	0.4
24	Glenberg sandy loam, 1 to 4 percent slopes, rarely flooded	629	*
25	Glenberg, rarely flooded-Bankard, occasionally flooded, complex, 0 to 3 percent slopes	25,730	1.9
26	Goshen silt loam, 0 to 2 percent slopes, rarely flooded	28,139	2.0
27	Haverson loam, 0 to 1 percent slopes, occasionally flooded	70	*
28	Haxtun loamy sand, 0 to 3 percent slopes	5,913	0.4
29	Iliff silt loam, 0 to 2 percent slopes	1,484	0.1
30	Julesburg loamy sand, 1 to 3 percent slopes	3,118	0.2
31	Julesburg loamy sand, 3 to 5 percent slopes	2,664	0.2
32	Julesburg sandy loam, 1 to 3 percent slopes	4,437	0.3
33	Julesburg sandy loam, 3 to 5 percent slopes	3,835	0.3
34	Julesburg-Otero complex, 1 to 9 percent slopes	1,723	0.1
35	Keith silt loam, 1 to 3 percent slopes	396	*
36	Kimst loam, 1 to 5 percent slopes	13,668	1.0
37	Kimst loam, 3 to 12 percent slopes	276	*
38	Kimst-Canyon loams, 2 to 5 percent slopes	40	*
39	Kimst-Richfield, eroded, complex, 1 to 5 percent slopes	6,310	0.5
40	Kimst-Wages sandy clay loams, 1 to 6 percent slopes	27,187	2.0
41	Kitcarson loam, 0 to 2 percent slopes, rarely flooded	1,084	*
42	Kuma-Keith very fine sandy loams, 1 to 3 percent slopes	2,697	0.2
43	Kuma-Keith silt loams, 0 to 2 percent slopes	136,226	9.9
44	Manter loamy sand, 1 to 6 percent slopes, overblown	664	*
45	Manter sandy loam, 1 to 3 percent slopes	1,354	*
46	Manter sandy loam, 3 to 5 percent slopes	6,678	0.5
47	Manter sandy loam, 5 to 9 percent slopes	2,088	0.2
48	Manter-Ascalon sandy loams, 5 to 15 percent slopes	16,974	1.2
49	Manter-Otero complex, 1 to 6 percent slopes	6,335	0.5
50	Manzanst clay loam, 1 to 3 percent slopes, rarely flooded	1,377	*
51	Midway-Razor clay loams, 5 to 15 percent slopes	5,566	0.4
52	Norka silt loam, 0 to 3 percent slopes	120,978	8.8
53	Norka silt loam, 1 to 3 percent slopes, eroded	3,379	0.2
54	Norka-Colby silt loams, 0 to 3 percent slopes	19,528	1.4
55	Norka-Colby silt loams, 3 to 5 percent slopes	55,275	4.0
56	Norka-Colby silt loams, 5 to 15 percent slopes	59,408	4.3
57	Norka-Colby-Weld silt loams, 3 to 5 percent slopes	27,322	2.0
58	Nunn sandy clay loam, 1 to 3 percent slopes, eroded	8,425	0.6
59	Nunn clay loam, 1 to 4 percent slopes, eroded	8,025	0.6
60	Olnest sandy loam, 1 to 6 percent slopes	3,345	0.2
61	Olnest sandy loam, 6 to 9 percent slopes	2,821	0.2

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
62	Olnest-Ascalon complex, 1 to 6 percent slopes	6,003	0.4
63	Otero fine sandy loam, 1 to 20 percent slopes, moist	3,623	0.3
64	Otero-Olnest sandy loams, 3 to 6 percent slopes	8	*
65	Oxyaquic Ustifluvents, occasionally flooded	1,402	0.1
66	Paoli fine sandy loam, 0 to 2 percent slopes, rarely flooded	7,169	0.5
67	Pits, gravel	190	*
68	Platner loam, 0 to 3 percent slopes	18,097	1.3
69	Pleasant silty clay loam, 0 to 1 percent slopes	8,822	0.6
70	Rago silt loam, 0 to 2 percent slopes, occasionally flooded	12,648	0.9
71	Rago-Weld silt loams, 0 to 2 percent slopes	19,824	1.4
72	Richfield silt loam, 0 to 2 percent slopes	17,550	1.3
73	Richfield silty clay loam, 0 to 2 percent slopes	11,648	0.8
74	Richfield silty clay loam, dry, 0 to 2 percent slopes, eroded	42,526	3.1
75	Sampson loam, 0 to 2 percent slopes, rarely flooded	18,295	1.3
76	Satanta loam, 1 to 3 percent slopes	20,228	1.5
77	Satanta-Colby complex, 3 to 5 percent slopes	52	*
78	Satanta-Sampson, rarely flooded, loams, 0 to 3 percent slopes	33,936	2.5
79	Satanta-Ulmet loams, 1 to 3 percent slopes	13,884	1.0
80	Stoneham loam, 1 to 3 percent slopes	3,931	0.3
81	Stoneham-Fort Collins loams, 3 to 5 percent slopes	40,560	2.9
82	Stoneham-Kimst-Fort Collins loams, 5 to 15 percent slopes	76,120	5.5
83	Ulmet loam, 1 to 3 percent slopes	2,003	0.1
84	Ulysses silt loam, 1 to 3 percent slopes	576	*
85	Valent sand, 1 to 9 percent slopes	175	*
86	Valent sand, 15 to 45 percent slopes	1,023	*
87	Valent loamy sand, 1 to 5 percent slopes	13,810	1.0
88	Valent loamy sand, 5 to 15 percent slopes	27,300	2.0
89	Vona fine sandy loam, 5 to 15 percent slopes	3,840	0.3
90	Wages loam, 0 to 2 percent slopes	3,925	0.3
91	Wages loam, 2 to 6 percent slopes	52,858	3.8
92	Wages loam, 6 to 15 percent slopes	23,924	1.7
93	Wages-Kimst loams, 1 to 4 percent slopes	997	*
94	Wages-Weld complex, 0 to 3 percent slopes	1,037	*
95	Weld silt loam, 0 to 2 percent slopes	50,751	3.7
96	Weld-Norka silt loams, 0 to 3 percent slopes	65,954	4.8
97	Wiley silt loam, 0 to 3 percent slopes	1,696	0.1
98	Water	132	*
	Total	1,382,600	100.0

* Less than 0.1 percent.

Table 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
5	Ascalon loam, 1 to 3 percent slopes (where irrigated)
6	Ascalon loam, 3 to 5 percent slopes (where irrigated)
8	Ascalon-Eckley loams, 1 to 5 percent slopes (where irrigated)
23	Fort Collins loam, 1 to 3 percent slopes (where irrigated)
26	Goshen silt loam, 0 to 2 percent slopes, rarely flooded (where irrigated)
35	Keith silt loam, 1 to 3 percent slopes (where irrigated)
40	Kimst-Wages sandy clay loams, 1 to 6 percent slopes (where irrigated)
43	Kuma-Keith silt loams, 0 to 2 percent slopes (where irrigated)
52	Norka silt loam, 0 to 3 percent slopes (where irrigated)
54	Norka-Colby silt loams, 0 to 3 percent slopes (where irrigated)
58	Nunn sandy clay loam, 1 to 3 percent slopes, eroded (where irrigated)
59	Nunn clay loam, 1 to 4 percent slopes, eroded (where irrigated)
68	Platner loam, 0 to 3 percent slopes (where irrigated)
70	Rago silt loam, 0 to 2 percent slopes, occasionally flooded (where irrigated)
71	Rago-Weld silt loams, 0 to 2 percent slopes (where irrigated)
72	Richfield silt loam, 0 to 2 percent slopes (where irrigated)
73	Richfield silty clay loam, 0 to 2 percent slopes (where irrigated)
74	Richfield silty clay loam, dry, 0 to 2 percent slopes, eroded (where irrigated)
75	Sampson loam, 0 to 2 percent slopes, rarely flooded (where irrigated)
76	Satanta loam, 1 to 3 percent slopes (where irrigated)
77	Satanta-Colby complex, 3 to 5 percent slopes (where irrigated)
78	Satanta-Sampson, rarely flooded, loams, 0 to 3 percent slopes (where irrigated)
79	Satanta-Ulmet loams, 1 to 3 percent slopes (where irrigated)
83	Ulmet loam, 1 to 3 percent slopes (where irrigated)
84	Ulysses silt loam, 1 to 3 percent slopes (where irrigated)
90	Wages loam, 0 to 2 percent slopes (where irrigated)
91	Wages loam, 2 to 6 percent slopes (where irrigated)
94	Wages-Weld complex, 0 to 3 percent slopes (where irrigated)
95	Weld silt loam, 0 to 2 percent slopes (where irrigated)
96	Weld-Norka silt loams, 0 to 3 percent slopes (where irrigated)

Table 6.--Land Capability and Yields per Acre of Crops

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability		Alfalfa hay		Dry pinto beans		Corn		Sunflowers		Wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	Bu	Bu	Lbs	Lbs	Bu	Bu
1---------- Ascalon	3e	3e	---	5.5	900	2,000	---	175	1,000	2,500	35	70
2---------- Ascalon	3e	3e	---	5.0	850	1,900	---	160	950	2,400	33	65
3---------- Ascalon	4e	4e	---	4.5	700	1,650	---	150	750	2,200	28	50
4---------- Ascalon	3e	2e	1.5	5.0	---	---	24	140	---	---	25	60
5---------- Ascalon	3e	2e	---	5.5	900	2,000	---	175	1,000	2,500	35	70
6---------- Ascalon	4e	4e	---	5.0	700	1,650	---	155	750	2,200	29	60
7---------- Ascalon	6e	6e	---	---	---	---	---	---	---	---	---	---
8----------			---	5.0	700	1,650	---	155	750	2,200	29	60
Ascalon----------	4e	4e										
Eckley----------	4s	4e										
9----------			---	5.5	900	2,000	---	175	1,000	2,500	35	70
Ascalon----------	3e	3e										
Haxtun----------	3e	3e										
10---------- Bayard	4e	4e	---	4.5	---	---	---	120	---	---	25	55
11---------- Beckton	4s	---	---	---	---	---	---	---	---	---	15	---
12---------- Bethune	3s	---	---	---	---	---	---	---	700	---	28	---
13---------- Canyon	6s	6e	---	---	---	---	---	---	---	---	---	---

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Dry pinto beans		Corn		Sunflowers		Wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	Bu	Bu	Lbs	Lbs	Bu	Bu
14----------			---	---	---	---	---	---	---	---	---	---
Canyon----------	7s	---										
Rock outcrop-------	8s	---										
15----------	3e	3e	---	4.5	650	1,650	---	140	1,000	2,000	26	60
Colby												
16----------	4e	4e	---	3.5	550	1,450	---	125	750	1,800	23	50
Colby												
17----------	6e	6e	---	---	---	---	---	---	---	---	---	---
Colby												
18----------	6e	6e	---	---	---	---	---	---	---	---	---	---
Colby												
19----------	3e	3e	---	4.5	650	1,650	---	140	1,000	2,000	26	60
Colby												
20----------			---	---	---	---	---	---	---	---	---	---
Colby----------	6e	6e										
Aridic Ustorthents-	7e	---										
21----------	6s	4s	---	---	---	---	---	---	---	---	---	---
Concordia												
22----------			---	---	---	---	---	---	---	---	---	---
Eckley----------	6e	6e										
Wages----------	6e	6e										
23----------	3e	2e	---	5.0	700	1,600	---	150	800	2,200	30	60
Fort Collins												
24----------	3e	3e	---	4.5	400	1,400	---	140	600	1,700	22	60
Glenberg												
25----------			---	4.5	400	1,400	---	140	600	1,700	22	60
Glenberg----------	3e	3e										
Bankard----------	6s	3e										
26----------	2c	2e	---	7.0	900	2,000	---	175	1,000	2,500	38	80
Goshen												
27----------	3w	2w	---	5.0	---	---	---	125	---	---	20	55
Haverson												

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Dry pinto beans		Corn		Sunflowers		Wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	Bu	Bu	Lbs	Lbs	Bu	Bu
28---------- Haxtun	3e	3e	---	5.0	800	1,900	---	160	900	2,300	35	65
29---------- Iliff	3s	3e	---	5.0	550	1,600	---	140	800	2,000	30	60
30---------- Julesburg	4e	3e	---	5.0	450	1,400	---	125	700	1,800	25	55
31---------- Julesburg	4e	4e	---	4.5	---	---	---	105	---	---	23	50
32---------- Julesburg	3e	3e	---	5.5	450	1,400	---	130	700	1,800	30	55
33---------- Julesburg	3e	3e	---	5.0	300	1,300	---	120	550	1,600	27	55
34----------			---	4.0	---	---	---	105	450	1,300	20	40
Julesburg----------	4e	4e										
Otero----------	4e	3e										
35---------- Keith	2e	2e	---	6.0	800	1,900	---	160	900	2,400	35	70
36---------- Kimst	4e	4e	---	3.5	500	1,400	---	120	700	1,700	20	55
37---------- Kimst	6e	6e	---	---	---	---	---	---	---	---	---	---
38----------			---	3.5	500	1,400	---	120	700	1,700	20	55
Kimst----------	4e	4e										
Canyon----------	6s	---										
39----------			---	3.5	500	1,400	---	120	700	1,700	20	55
Kimst----------	4e	4e										
Richfield----------	3e	2e										
40----------			---	3.5	500	1,400	---	120	700	1,700	20	55
Kimst----------	4e	4e										
Wages----------	4e	4e										

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Dry pinto beans		Corn		Sunflowers		Wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	Bu	Bu	Lbs	Lbs	Bu	Bu
41---------- Kitcarson	3w	2w	---	6.0	---	---	---	145	---	---	30	60
42----------			---	6.5	800	2,000	---	170	900	2,500	35	80
Kuma----------	3e	3e										
Keith----------	3e	3e										
43----------			---	7.0	900	2,000	---	175	1,000	2,500	38	80
Kuma----------	2c	2e										
Keith----------	2c	2e										
44---------- Manter	4e	3e	---	4.0	---	---	---	105	450	1,300	20	45
45---------- Manter	3e	3e	---	5.5	450	1,400	---	130	700	1,800	30	55
46---------- Manter	4e	3e	---	4.5	300	1,350	---	120	550	1,600	25	55
47---------- Manter	4e	4e	---	4.5	300	1,300	---	105	500	1,500	20	40
48----------			---	---	---	---	---	---	---	---	---	---
Manter----------	6e	6e										
Ascalon----------	6e	6e										
49----------			---	4.5	300	1,350	---	120	550	1,600	25	55
Manter----------	4e	3e										
Otero----------	4e	3e										
50---------- Manzanst	4e	---	---	---	---	---	---	---	---	---	26	---
51----------			---	---	---	---	---	---	---	---	---	---
Midway----------	7e	7e										
Razor----------	6e	6e										
52---------- Norka	3e	2e	---	6.0	800	1,800	---	160	1,000	2,500	35	70
53---------- Norka	3e	2e	---	4.5	650	1,650	---	140	850	2,400	27	60

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Dry pinto beans		Corn		Sunflowers		Wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	Bu	Bu	Lbs	Lbs	Bu	Bu
54			---	6.0	800	1,800	---	160	1,000	2,500	35	70
Norka	3e	2e										
Colby	3e	3e										
55			---	4.5	700	1,700	---	150	800	2,200	27	50
Norka	4e	4e										
Colby	4e	4e										
56			---	---	---	---	---	---	---	---	---	---
Norka	6e	6e										
Colby	6e	6e										
57			---	4.5	600	1,600	---	150	700	2,000	25	50
Norka	4e	4e										
Colby	4e	4e										
Weld	4e	4e										
58	3e	2e	---	5.5	700	1,700	---	155	800	2,200	32	65
Nunn												
59	3e	3e	---	5.0	600	1,600	---	150	700	2,200	30	60
Nunn												
60	4e	4e	---	---	400	---	---	---	700	---	27	---
Olnest												
61	6e	6e	---	---	---	---	---	---	---	---	---	---
Olnest												
62			---	---	500	---	---	---	800	---	29	---
Olnest	4e	4e										
Ascalon	4e	3e										
63	6e	6e	---	---	---	---	---	---	---	---	---	---
Otero												
64			---	---	---	---	---	---	---	---	---	---
Otero	6e	4e										
Olnest	4e	4e										
65	6w	6w	---	---	---	---	---	---	---	---	---	---
Oxyaquic Ustifluvents												
66	3c	3e	---	5.0	450	1,400	---	150	800	2,000	30	65
Paoli												

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Dry pinto beans		Corn		Sunflowers		Wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	Bu	Bu	Lbs	Lbs	Bu	Bu
67---------- Pits, gravel	8s	---	---	---	---	---	---	---	---	---	---	---
68---------- Platner	3e	2e	---	5.0	800	2,000	---	170	900	2,200	35	65
69---------- Pleasant	4w	---	---	---	---	---	---	---	---	---	25	---
70---------- Rago	3w	2w	---	6.0	750	1,800	---	165	900	2,300	35	70
71----------			---	7.0	900	2,000	---	175	1,000	2,500	38	80
Rago----------	2c	2e										
Weld----------	2c	2e										
72---------- Richfield	2c	2e	---	7.0	900	2,000	---	175	1,000	2,500	38	80
73---------- Richfield	2c	2e	---	7.0	900	2,000	---	175	1,000	2,500	38	80
74---------- Richfield	3e	2e	---	5.0	700	1,800	---	140	800	2,200	30	60
75---------- Sampson	3c	2e	---	4.0	900	1,800	---	140	1,000	2,500	25	60
76---------- Satanta	3e	2e	---	6.0	900	1,800	---	160	1,000	2,500	35	70
77----------			---	5.0	---	---	---	130	---	---	---	---
Satanta----------	4e	4e										
Colby----------	4e	4e										
78----------			---	6.0	900	1,800	---	160	1,000	2,500	35	70
Satanta----------	3e	2e										
Sampson----------	3c	2e										
79----------			---	6.0	900	1,800	---	160	1,000	2,500	35	70
Satanta----------	3e	2e										
Ulmet----------	3e	2e										
80---------- Stoneham	3e	3e	---	5.0	600	1,500	---	140	800	1,900	25	60

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Dry pinto beans		Corn		Sunflowers		Wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	Bu	Bu	Lbs	Lbs	Bu	Bu
81			---	4.0	400	1,300	---	130	600	1,700	23	55
Stoneham	4e	4e										
Fort Collins	4e	4e										
82			---	---	---	---	---	---	---	---	---	---
Stoneham	6e	6e										
Kimst	6e	6e										
Fort Collins	6e	6e										
83	3e	2e	---	5.0	700	1,700	---	150	800	2,200	30	60
Ulmet												
84	3e	2e	---	6.0	800	1,800	---	160	1,000	2,500	35	70
Ulysses												
85	6e	4e	---	4.0	---	1,200	---	165	---	1,000	---	50
Valent												
86	7e	7e	---	---	---	---	---	---	---	---	---	---
Valent												
87	6e	4e	---	4.0	---	1,200	---	165	---	1,000	---	50
Valent												
88	6e	6e	---	---	---	---	---	---	---	---	---	---
Valent												
89	6e	6e	---	---	---	---	---	---	---	---	---	---
Vona												
90	3c	2e	---	5.5	800	1,700	---	155	900	2,400	33	65
Wages												
91	4e	4e	---	4.5	600	1,500	---	145	700	2,000	27	50
Wages												
92	6e	6e	---	---	---	---	---	---	---	---	---	---
Wages												
93			---	5.0	700	1,600	---	150	800	2,300	30	60
Wages	4e	2e										
Kimst	4e	4e										

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Dry pinto beans		Corn		Sunflowers		Wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Tons	Tons	Lbs	Lbs	Bu	Bu	Lbs	Lbs	Bu	Bu
94----------			---	5.0	700	1,600	---	150	800	2,300	30	60
Wages----------	3e	2e										
Weld----------	3e	2e										
95----------	3c	2e	---	6.0	800	2,000	---	170	950	2,500	35	70
Weld												
96----------			---	5.5	750	1,800	---	160	900	2,300	33	65
Weld----------	3e	2e										
Norka----------	3e	2e										
97----------	3e	3e	---	4.0	---	---	---	145	---	---	30	70
Wiley												

Table 7.--Rangeland Productivity and Characteristic Plant Communities

(Only the soils that support rangeland vegetation suitable for grazing are rated. See text for definitions of terms used in this table)

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
1:							
Ascalon	Sandy Plains	2,300	1,750	1,000	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
					Indiangrass	---	4
					sun sedge	---	3
					western wheatgrass	---	3
					sand sagebrush	---	2
2:							
Ascalon	Sandy Plains	2,300	1,750	1,000	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
					Indiangrass	---	4
					sun sedge	---	3
					western wheatgrass	---	3
					sand sagebrush	---	2
3:							
Ascalon	Sandy Plains	2,300	1,750	1,000	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
					Indiangrass	---	4
					sun sedge	---	3
					western wheatgrass	---	3
					sand sagebrush	---	2

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
4:							
Ascalon	Sandy Plains	1,700	1,200	750	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
					Indiangrass	---	4
					sun sedge	---	3
					western wheatgrass	---	3
					sand sagebrush	---	2
5:							
Ascalon	Loamy Plains	1,800	1,500	800	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					needleandthread	---	5
					fourwing saltbush	---	4
					sun sedge	---	3
					winterfat	---	3
6:							
Ascalon	Loamy Plains	1,600	1,000	500	blue grama	---	40
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	5
					sun sedge	---	5
					fourwing saltbush	---	3
					winterfat	---	2
7:							
Ascalon	Loamy Plains	1,600	1,000	500	blue grama	---	40
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	5
					sun sedge	---	5
					fourwing saltbush	---	3
					winterfat	---	2

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
8:							
Ascalon	Loamy Plains	1,600	1,000	500	blue grama	---	40
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	5
					sun sedge	---	5
					fourwing saltbush	---	3
					winterfat	---	2
Eckley	Gravel Breaks	1,400	900	600	sideoats grama	---	30
					blue grama	---	20
					little bluestem	---	20
					needleandthread	---	10
					prairie sandreed	---	5
					sedge	---	5
					sand bluestem	---	2
					sand dropseed	---	2
					switchgrass	---	2
9:							
Ascalon	Sandy Plains	2,300	1,750	1,000	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
					Indiangrass	---	4
					sun sedge	---	3
					western wheatgrass	---	3
					sand sagebrush	---	2
Haxtun	Sandy Plains	2,300	1,750	1,000	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					sun sedge	---	3
					western wheatgrass	---	3

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
10:							
Bayard	Sandy Plains	2,000	1,600	800	prairie sandreed	---	25
					blue grama	---	20
					little bluestem	---	10
					switchgrass	---	10
					sideoats grama	---	8
					sand dropseed	---	5
11:							
Beckton	Salt Flat	1,800	1,500	1,000	alkali sacaton	---	40
					western wheatgrass	---	30
					blue grama	---	15
					fourwing saltbush	---	5
12:							
Bethune	Loamy Plains	1,600	950	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	5
					buffalograss	---	4
					fourwing saltbush	---	4
					sun sedge	---	3
					winterfat	---	2
13:							
Canyon	Limestone Breaks	1,400	1,050	750	little bluestem	---	20
					sideoats grama	---	20
					blue grama	---	10
					hairy grama	---	5
					needleandthread	---	5
					miscellaneous perennial forbs	---	5
					miscellaneous shrubs	---	5
					prairie sandreed	---	5
					threadleaf sedge	---	5
					western wheatgrass	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
14:							
Canyon	Limestone Breaks	1,400	1,050	750	little bluestem	---	20
					sideoats grama	---	20
					blue grama	---	10
					hairy grama	---	5
					needleandthread	---	5
					miscellaneous perennial forbs	---	5
					miscellaneous shrubs	---	5
					prairie sandreed	---	5
					threadleaf sedge	---	5
					western wheatgrass	---	5
Rock outcrop.							
15:							
Colby	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	10
					fourwing saltbush	---	5
					winterfat	---	5
16:							
Colby	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	10
					fourwing saltbush	---	5
					winterfat	---	5
17:							
Colby	Loamy Slopes	1,650	1,200	650	blue grama	---	40
					western wheatgrass	---	20
					green needlegrass	---	10
					sideoats grama	---	10
					little bluestem	---	5
					needleandthread	---	5
					winterfat	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
18:							
Colby	Loamy Slopes	1,300	900	450	blue grama	---	35
					western wheatgrass	---	25
					green needlegrass	---	10
					needleandthread	---	10
					little bluestem	---	5
					sideoats grama	---	5
					winterfat	---	5
19:							
Colby	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	10
					fourwing saltbush	---	5
					winterfat	---	5
20:							
Colby	Loess Breaks	1,500	1,200	750	little bluestem	---	25
					sideoats grama	---	25
					blue grama	---	20
					western wheatgrass	---	10
					buffalograss	---	5
					green needlegrass	---	5
					needleandthread	---	5
Aridic Ustorthents.							
21:							
Concordia	Salt Meadow	3,500	2,800	1,800	alkali sacaton	---	35
					switchgrass	---	20
					western wheatgrass	---	20
					prairie cordgrass	---	10
					Sandberg bluegrass	---	5
					inland saltgrass	---	2
22:							
Eckley	Gravel Breaks	1,400	900	600	sideoats grama	---	30
					blue grama	---	20
					little bluestem	---	20
					needleandthread	---	10
					prairie sandreed	---	5
					sedge	---	5
					sand bluestem	---	2
					sand dropseed	---	2
					switchgrass	---	2

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
22:							
Wages	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5
23:							
Fort Collins	Loamy Plains	1,600	1,100	800	blue grama	---	40
					western wheatgrass	---	30
					green needlegrass	---	10
					buffalograss	---	5
					fourwing saltbush	---	5
					needleandthread	---	5
					sand dropseed	---	5
					sedge	---	5
24:							
Glenberg	Sandy Bottomland	2,500	2,000	1,800	prairie sandreed	---	20
					switchgrass	---	15
					blue grama	---	10
					needlegrass	---	10
					western wheatgrass	---	10
					little bluestem	---	5
					sand bluestem	---	5
					sand dropseed	---	5
					sand sagebrush	---	5
					sedge	---	5
25:							
Glenberg	Sandy Bottomland	2,500	2,000	1,800	prairie sandreed	---	20
					switchgrass	---	15
					blue grama	---	10
					needlegrass	---	10
					western wheatgrass	---	10
					little bluestem	---	5
					sand bluestem	---	5
					sand dropseed	---	5
					sand sagebrush	---	5
					sedge	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
25:							
Bankard	Sandy Bottomland	2,500	1,800	1,200	switchgrass	---	25
					prairie sandreed	---	15
					sand bluestem	---	15
					little bluestem	---	5
					needleandthread	---	5
					sedge	---	5
					sideoats grama	---	5
					western wheatgrass	---	5
26:							
Goshen	Overflow	2,800	2,000	1,200	western wheatgrass	---	35
					green needlegrass	---	15
					switchgrass	---	15
					big bluestem	---	10
					blue grama	---	5
					fourwing saltbush	---	5
					sideoats grama	---	5
					Indiangrass	---	5
27:							
Haverson	Overflow	2,800	2,000	1,200	western wheatgrass	---	35
					green needlegrass	---	15
					switchgrass	---	15
					blue grama	---	10
					big bluestem	---	5
					buffalograss	---	5
					sedge	---	5
28:							
Haxtun	Sandy Plains	2,300	1,750	1,000	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					sun sedge	---	3
					western wheatgrass	---	3

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
29:							
Iliff	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	15
					buffalograss	---	5
					needleandthread	---	5
					sedge	---	5
30:							
Julesburg	Deep Sands	2,500	2,000	1,500	prairie sandreed	---	30
					switchgrass	---	20
					sand bluestem	---	15
					blue grama	---	10
					little bluestem	---	5
					needleandthread	---	5
					sand dropseed	---	5
					sand sagebrush	---	5
					Indiangrass	---	5
31:							
Julesburg	Deep Sands	2,500	2,000	1,500	prairie sandreed	---	30
					switchgrass	---	20
					sand bluestem	---	15
					blue grama	---	10
					little bluestem	---	5
					needleandthread	---	5
					sand dropseed	---	5
					sand sagebrush	---	5
					Indiangrass	---	5
32:							
Julesburg	Sandy Plains	2,000	1,500	1,200	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					switchgrass	---	10
					sideoats grama	---	6
					needleandthread	---	5
					sand bluestem	---	5
					sand dropseed	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
33:							
Julesburg	Sandy Plains	2,000	1,500	1,200	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					switchgrass	---	10
					sideoats grama	---	6
					needleandthread	---	5
					sand bluestem	---	5
					sand dropseed	---	5
34:							
Julesburg	Sandy Plains	2,000	1,500	1,200	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					switchgrass	---	10
					sideoats grama	---	6
					needleandthread	---	5
					sand bluestem	---	5
					sand dropseed	---	5
Otero	Sandy Plains	2,300	1,750	1,000	blue grama	---	30
					prairie sandreed	---	25
					needleandthread	---	10
					sand bluestem	---	10
					little bluestem	---	5
					sand dropseed	---	5
					sideoats grama	---	5
35:							
Keith	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
36:							
Kimst	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	10
					fourwing saltbush	---	5
					winterfat	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
37:							
Kimst	Loamy Slopes	1,300	900	450	blue grama	---	35
					western wheatgrass	---	25
					green needlegrass	---	10
					needleandthread	---	10
					little bluestem	---	5
					sideoats grama	---	5
					winterfat	---	5
38:							
Kimst	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	10
					fourwing saltbush	---	5
					winterfat	---	5
Canyon	Limestone Breaks	1,200	900	500	little bluestem	---	25
					sideoats grama	---	25
					blue grama	---	15
					hairy grama	---	5
					needleandthread	---	5
					miscellaneous perennial forbs	---	5
					miscellaneous shrubs	---	5
					threadleaf sedge	---	5
					western wheatgrass	---	5
39:							
Kimst	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	10
					fourwing saltbush	---	5
					winterfat	---	5
Richfield	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	20
					needleandthread	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
40:							
Kimst	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	10
					fourwing saltbush	---	5
					winterfat	---	5
Wages	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5
41:							
Kitcarson	Wet Meadow	4,000	3,500	3,000	switchgrass	---	20
					big bluestem	---	15
					prairie cordgrass	---	15
					sedge	---	10
					western wheatgrass	---	10
					Indiangrass	---	10
					Baltic rush	---	5
					Canada wildrye	---	5
					vine mesquite	---	5
42:							
Kuma	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
Keith	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
43:							
Kuma	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
Keith	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
44:							
Manter	Sandy Plains	2,300	1,800	1,500	prairie sandreed	---	25
					switchgrass	---	15
					blue grama	---	10
					sand bluestem	---	8
					little bluestem	---	5
					needlegrass	---	5
					sand dropseed	---	5
					sand sagebrush	---	5
45:							
Manter	Sandy Plains	2,300	1,800	1,500	prairie sandreed	---	25
					switchgrass	---	15
					blue grama	---	10
					sand bluestem	---	8
					little bluestem	---	5
					needlegrass	---	5
					sand dropseed	---	5
					sand sagebrush	---	5
46:							
Manter	Sandy Plains	2,300	1,800	1,500	prairie sandreed	---	25
					switchgrass	---	15
					blue grama	---	10
					sand bluestem	---	8
					little bluestem	---	5
					needlegrass	---	5
					sand dropseed	---	5
					sand sagebrush	---	5
47:							
Manter	Sandy Plains	2,300	1,800	1,500	prairie sandreed	---	25
					switchgrass	---	15
					blue grama	---	10
					sand bluestem	---	8
					little bluestem	---	5
					needlegrass	---	5
					sand dropseed	---	5
					sand sagebrush	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
48:							
Manter	Sandy Plains	2,300	1,800	1,500	prairie sandreed	---	25
					switchgrass	---	15
					blue grama	---	10
					sand bluestem	---	8
					little bluestem	---	5
					needlegrass	---	5
					sand dropseed	---	5
					sand sagebrush	---	5
Ascalon	Sandy Plains	2,300	1,750	1,000	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
					Indiangrass	---	4
					sun sedge	---	3
					western wheatgrass	---	3
					sand sagebrush	---	2
49:							
Manter	Sandy Plains	2,300	1,800	1,500	prairie sandreed	---	25
					switchgrass	---	15
					blue grama	---	10
					sand bluestem	---	8
					little bluestem	---	5
					needlegrass	---	5
					sand dropseed	---	5
					sand sagebrush	---	5
Otero	Sandy Plains	2,300	1,750	1,000	blue grama	---	30
					prairie sandreed	---	25
					needleandthread	---	10
					sand bluestem	---	10
					little bluestem	---	5
					sand dropseed	---	5
					sideoats grama	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
50:							
Manzanst	Overflow	2,800	2,200	1,200	western wheatgrass	---	35
					green needlegrass	---	20
					switchgrass	---	15
					big bluestem	---	10
					fourwing saltbush	---	10
					blue grama	---	5
					buffalograss	---	5
51:							
Midway	Shaly Plains	1,100	700	400	alkali sacaton	---	25
					western wheatgrass	---	25
					blue grama	---	15
					sideoats grama	---	15
					green needlegrass	---	10
					fourwing saltbush	---	5
					winterfat	---	5
Razor	Clayey Plains	1,300	900	600	western wheatgrass	---	30
					blue grama	---	25
					fourwing saltbush	---	15
					galleta	---	5
					alkali sacaton	---	5
52:							
Norka	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
53:							
Norka	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
54:							
Norka	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
54:							
Colby	Loamy Plains	1,700	1,400	700	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					needleandthread	---	10
					fourwing saltbush	---	5
55:							
Norka	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
Colby	Loamy Plains	1,700	1,400	700	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					needleandthread	---	10
					fourwing saltbush	---	5
56:							
Norka	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
Colby	Loamy Slopes	1,650	1,200	650	blue grama	---	40
					western wheatgrass	---	20
					green needlegrass	---	10
					sideoats grama	---	10
					little bluestem	---	5
					needleandthread	---	5
					winterfat	---	5
57:							
Norka	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	20
					needleandthread	---	5
Colby	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	10
					fourwing saltbush	---	5
					winterfat	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
57:							
Weld	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	20
					needleandthread	---	5
58:							
Nunn	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	20
					fourwing saltbush	---	5
					needleandthread	---	5
59:							
Nunn	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5
60:							
Olnest	Sandy Plains	2,000	1,500	800	blue grama	---	25
					prairie sandreed	---	25
					needleandthread	---	10
					sand bluestem	---	10
					sideoats grama	---	10
					sand dropseed	---	5
					thickspike wheatgrass	---	5
					western wheatgrass	---	5
61:							
Olnest	Sandy Plains	2,000	1,500	800	blue grama	---	25
					prairie sandreed	---	25
					needleandthread	---	10
					sand bluestem	---	10
					sideoats grama	---	10
					sand dropseed	---	5
					thickspike wheatgrass	---	5
					western wheatgrass	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
62:							
Olnest	Loamy Plains	1,550	950	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					buffalograss	---	5
					needleandthread	---	5
					sun sedge	---	5
Ascalon	Sandy Plains	2,000	1,500	800	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
					Indiangrass	---	4
					sun sedge	---	3
					western wheatgrass	---	3
					sand sagebrush	---	2
63:							
Otero	Choppy Sands	2,000	1,500	800	prairie sandreed	---	20
					sand bluestem	---	20
					switchgrass	---	10
					little bluestem	---	7
					needleandthread	---	7
					blue grama	---	5
					sand dropseed	---	5
					sandhill muhly	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
64:							
Otero	Sandy Plains	2,000	1,500	800	blue grama	---	25
					prairie sandreed	---	25
					needleandthread	---	10
					sand bluestem	---	10
					sideoats grama	---	10
					sand dropseed	---	5
					thickspike wheatgrass	---	5
					western wheatgrass	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
64:							
Olnest	Sandy Plains	2,000	1,500	800	blue grama	---	25
					prairie sandreed	---	25
					needleandthread	---	10
					sand bluestem	---	10
					sideoats grama	---	10
					sand dropseed	---	5
					thickspike wheatgrass	---	5
					western wheatgrass	---	5
65:							
Oxyaquic Ustifluvents	River Bottom	2,500	2,000	1,500	western wheatgrass	20	20
					switchgrass	15	15
					slender wheatgrass	10	10
					sedge	---	10
					rush	5	5
					willow	5	5
					Indiangrass	5	5
					big bluestem	---	5
66:							
Paoli	Sandy Plains	2,300	1,750	1,000	prairie sandreed	---	20
					blue grama	---	15
					little bluestem	---	10
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
					Indiangrass	---	4
					sun sedge	---	3
					western wheatgrass	---	3
					sand sagebrush	---	2
67:							
Pits, gravel.							
68:							
Platner	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	30
					green needlegrass	---	20
					needleandthread	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
69:							
Pleasant	Plains Swale	1,800	1,200	900	western wheatgrass	---	65
					blue grama	---	10
					buffalograss	---	5
					sun sedge	---	5
70:							
Rago	Overflow	2,800	2,000	1,200	western wheatgrass	---	30
					green needlegrass	---	15
					switchgrass	---	15
					blue grama	---	10
					big bluestem	---	5
					buffalograss	---	5
					sedge	---	5
					Indiangrass	---	5
71:							
Rago	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
Weld	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
72:							
Richfield	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
73:							
Richfield	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
74:							
Richfield	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	20
					needleandthread	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
75:							
Sampson	Overflow	3,000	2,200	1,100	western wheatgrass	---	35
					green needlegrass	---	15
					switchgrass	---	15
					big bluestem	---	10
					blue grama	---	5
					fourwing saltbush	---	5
					sideoats grama	---	5
					Indiangrass	---	5
76:							
Satanta	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5
77:							
Satanta	Loamy Plains	1,600	1,200	800	blue grama	---	35
					western wheatgrass	---	15
					green needlegrass	---	10
					needleandthread	---	10
					miscellaneous perennial forbs	---	5
					prairie sandreed	---	5
Colby	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	10
					fourwing saltbush	---	5
					winterfat	---	5
78:							
Satanta	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
78:							
Sampson	Overflow	3,000	2,200	1,100	western wheatgrass	---	35
					green needlegrass	---	15
					switchgrass	---	15
					big bluestem	---	10
					blue grama	---	5
					fourwing saltbush	---	5
					sideoats grama	---	5
					Indiangrass	---	5
79:							
Satanta	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5
Ulmet	Loamy Plains	1,600	950	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	5
					buffalograss	---	4
					fourwing saltbush	---	4
					sedge	---	3
					winterfat	---	2
80:							
Stoneham	Loamy Plains	1,600	1,200	900	blue grama	---	40
					western wheatgrass	---	25
					green needlegrass	---	15
					buffalograss	---	7
					miscellaneous perennial grasses	---	5
					sedge	---	5
					sideoats grama	---	5
81:							
Stoneham	Loamy Plains	1,600	1,200	900	blue grama	---	40
					western wheatgrass	---	25
					green needlegrass	---	15
					buffalograss	---	7
					miscellaneous perennial grasses	---	5
					sedge	---	5
					sideoats grama	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
81:							
Fort Collins	Loamy Plains	1,600	1,100	800	blue grama	---	40
					western wheatgrass	---	30
					green needlegrass	---	10
					buffalograss	---	5
					fourwing saltbush	---	5
					needleandthread	---	5
					sand dropseed	---	5
					sedge	---	5
82:							
Stoneham	Loamy Plains	1,600	1,200	900	blue grama	---	40
					western wheatgrass	---	25
					green needlegrass	---	15
					buffalograss	---	7
					miscellaneous perennial grasses	---	5
					sedge	---	5
					sideoats grama	---	5
Kimst	Loamy Slopes	1,300	900	450	blue grama	---	35
					western wheatgrass	---	25
					green needlegrass	---	10
					needleandthread	---	10
					little bluestem	---	5
					sideoats grama	---	5
					winterfat	---	5
Fort Collins	Loamy Plains	1,600	1,100	800	blue grama	---	40
					western wheatgrass	---	30
					green needlegrass	---	10
					buffalograss	---	5
					fourwing saltbush	---	5
					needleandthread	---	5
					sand dropseed	---	5
					sedge	---	5
83:							
Ulmet	Loamy Plains	1,600	950	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	5
					buffalograss	---	4
					fourwing saltbush	---	4
					sedge	---	3
					winterfat	---	2

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
84:							
Ulysses	Loamy Plains	1,800	1,500	800	western wheatgrass	---	40
					blue grama	---	25
					green needlegrass	---	25
					needleandthread	---	5
85:							
Valent	Deep Sands	3,000	2,000	1,200	sand bluestem	---	30
					prairie sandreed	---	25
					switchgrass	---	15
					blue grama	---	7
					little bluestem	---	5
					needleandthread	---	5
					sand sagebrush	---	5
86:							
Valent	Choppy Sands	2,000	1,500	800	prairie sandreed	---	20
					sand bluestem	---	20
					switchgrass	---	10
					little bluestem	---	7
					needleandthread	---	7
					blue grama	---	5
					sand dropseed	---	5
					sandhill muhly	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
87:							
Valent	Deep Sands	3,000	2,000	1,200	sand bluestem	---	30
					prairie sandreed	---	25
					switchgrass	---	15
					blue grama	---	7
					little bluestem	---	5
					needleandthread	---	5
					sand sagebrush	---	5
88:							
Valent	Deep Sands	3,000	2,000	1,200	sand bluestem	---	30
					prairie sandreed	---	25
					switchgrass	---	15
					blue grama	---	7
					little bluestem	---	5
					needleandthread	---	5
					sand sagebrush	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
89:							
Vona	Sandy Plains	2,300	1,750	1,000	prairie sandreed	---	30
					blue grama	---	15
					little bluestem	---	15
					sand bluestem	---	10
					switchgrass	---	10
					needleandthread	---	5
					sideoats grama	---	5
					thickspike wheatgrass	---	5
90:							
Wages	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5
91:							
Wages	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5
92:							
Wages	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5
93:							
Wages	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5
Kimst	Loamy Plains	1,600	1,000	500	blue grama	---	35
					western wheatgrass	---	30
					green needlegrass	---	10
					needleandthread	---	10
					fourwing saltbush	---	5
					winterfat	---	5

Table 7.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition	
		Favorable year	Normal year	Unfavorable year		Forest	Range
		Lb/acre	Lb/acre	Lb/acre		Pct	Pct
94:							
Wages	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	15
					fourwing saltbush	---	5
					needleandthread	---	5
Weld	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	20
					needleandthread	---	5
95:							
Weld	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	20
					needleandthread	---	5
96:							
Weld	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	20
					needleandthread	---	5
Norka	Loamy Plains	1,600	1,000	500	western wheatgrass	---	35
					blue grama	---	30
					green needlegrass	---	20
					needleandthread	---	5
97:							
Wiley	Loamy Plains	1,600	1,000	600	blue grama	---	40
					western wheatgrass	---	30
					green needlegrass	---	10
					buffalograss	---	5
					needleandthread	---	5

Table 8.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
1: Ascalon	American plum, Siberian peashrub, common chokecherry, skunkbush sumac	Rocky Mountain juniper, eastern redcedar	Austrian pine, blue spruce, common hackberry, green ash, honeylocust, ponderosa pine	---	---
2: Ascalon	American plum, Siberian peashrub, common chokecherry, skunkbush sumac	Rocky Mountain juniper, eastern redcedar	Austrian pine, blue spruce, common hackberry, green ash, honeylocust, ponderosa pine	---	---
3: Ascalon	American plum, Siberian peashrub, common chokecherry, skunkbush sumac	Rocky Mountain juniper, eastern redcedar	Austrian pine, blue spruce, common hackberry, green ash, honeylocust, ponderosa pine	---	---
4: Ascalon	American plum, common lilac	---	Rocky Mountain juniper, Russian-olive, eastern redcedar, ponderosa pine	Siberian elm, common hackberry	---
5: Ascalon	American plum, Siberian peashrub, common chokecherry, skunkbush sumac	Rocky Mountain juniper, eastern redcedar	Austrian pine, blue spruce, common hackberry, green ash, honeylocust, ponderosa pine	---	---
6: Ascalon	Skunkbush sumac, Nanking cherry, Siberian peashrub, common chokecherry	Rocky Mountain juniper, eastern redcedar, honeylocust, Austrian pine, common hackberry, green ash, ponderosa pine	Blue spruce---	---	---
7: Ascalon	Skunkbush sumac, Nanking cherry, Siberian peashrub, common chokecherry	Rocky Mountain juniper, eastern redcedar, honeylocust, Austrian pine, common hackberry, green ash, ponderosa pine	Blue spruce---	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
8:					
Ascalon	Skunkbush sumac, Nanking cherry, Siberian peashrub, common chokecherry	Rocky Mountain juniper, eastern redcedar, honeylocust, Austrian pine, common hackberry, green ash, ponderosa pine	Blue spruce	---	---
Eckley	Rocky Mountain juniper, Siberian peashrub, Tatarian honeysuckle, eastern redcedar	Russian-olive, ponderosa pine	Siberian elm	---	---
9:					
Ascalon	American plum, Siberian peashrub, common chokecherry, skunkbush sumac	Rocky Mountain juniper, eastern redcedar	Austrian pine, blue spruce, common hackberry, green ash, honeylocust, ponderosa pine	---	---
Haxtun	American plum, Siberian peashrub, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar	Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---
10:					
Bayard	American plum, Amur honeysuckle, common chokecherry, common lilac	Rocky Mountain juniper, Russian mulberry, eastern redcedar	Common hackberry, green ash, honeylocust, ponderosa pine, Siberian elm	---	---
11:					
Beckton	Rocky Mountain juniper, Siberian peashrub, common lilac, eastern redcedar, green ash, skunkbush sumac	Ponderosa pine, Russian-olive, Siberian elm	---	---	---
12:					
Bethune	Siberian peashrub, skunkbush sumac, American plum, common chokecherry, common lilac	Rocky Mountain juniper, Russian-olive, common hackberry, eastern redcedar, green ash, ponderosa pine	---	---	---
13:					
Canyon.					
14:					
Canyon.					
Rock outcrop.					

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
15:					
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
16:					
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
17:					
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
18:					
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
19:					
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
20:					
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
Aridic Ustorthents.					
21:					
Concordia.					

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
22:					
Eckley	Rocky Mountain juniper, Siberian peashrub, Tatarian honeysuckle, eastern redcedar	Russian-olive, ponderosa pine	Siberian elm	---	---
Wages	Skunkbush sumac, Siberian peashrub, common chokecherry, common lilac	Eastern redcedar, honeylocust, Austrian pine, Russian-olive, green ash, ponderosa pine	Blue spruce, Siberian elm	---	---
23:					
Fort Collins	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac	Rocky Mountain juniper, Russian mulberry, Austrian pine, Russian-olive, green ash, ponderosa pine	Blue spruce, Siberian elm	---	---
24:					
Glenberg	American plum, common lilac, skunkbush sumac	Osage orange	Rocky Mountain juniper, blue spruce, common hackberry, eastern redcedar, honeylocust, ponderosa pine, golden willow	Siberian elm	---
25:					
Glenberg	American plum, common lilac, skunkbush sumac	Osage orange	Rocky Mountain juniper, blue spruce, common hackberry, eastern redcedar, honeylocust, ponderosa pine, golden willow	Siberian elm	---
Bankard	American plum, skunkbush sumac	Siberian peashrub, osage orange	Rocky Mountain juniper, blue spruce, common hackberry, eastern redcedar, honeylocust, ponderosa pine, green ash	Siberian elm	---
26:					
Goshen	American plum, Nanking cherry, Siberian peashrub, common lilac	---	Austrian pine, blue spruce, common hackberry, eastern redcedar, honeylocust, ponderosa pine, green ash	Siberian elm	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
27: Haverson	Western sandcherry, Nanking cherry, Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Russian mulberry	Austrian pine, Rocky Mountain juniper, Scotch pine, black locust, blue spruce, common hackberry, eastern redcedar, honeylocust, ponderosa pine, green ash	Siberian elm	---
28: Haxtun	American plum, Siberian peashrub, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar	Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---
29: Iliff	Nanking cherry, rugosa rose, skunkbush sumac, common chokecherry, common lilac	Rocky Mountain juniper, Russian-olive, eastern redcedar, common hackberry, green ash, ponderosa pine	---	---	---
30: Julesburg	American plum, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive, eastern redcedar	Common hackberry, green ash, honeylocust, osage orange, ponderosa pine, Siberian elm	---	---
31: Julesburg	American plum, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive, eastern redcedar	Common hackberry, green ash, honeylocust, osage orange, ponderosa pine, Siberian elm	---	---
32: Julesburg	American plum, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive, eastern redcedar	Common hackberry, green ash, honeylocust, osage orange, ponderosa pine, Siberian elm	---	---
33: Julesburg	American plum, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive, eastern redcedar	Common hackberry, green ash, honeylocust, osage orange, ponderosa pine, Siberian elm	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
34:					
Julesburg	American plum, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive, eastern redcedar	Common hackberry, green ash, honeylocust, osage orange, ponderosa pine, Siberian elm	---	---
Otero	American plum, Nanking cherry, Siberian peashrub, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive, eastern redcedar, green ash, honeylocust, ponderosa pine	---	---	---
35:					
Keith	American plum, Tatarian honeysuckle, common chokecherry, common lilac	Eastern redcedar	Austrian pine, Russian-olive, blue spruce, green ash, honeylocust, ponderosa pine	Siberian elm	---
36:					
Kimst	Siberian peashrub, Tatarian honeysuckle, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
37:					
Kimst	Rocky Mountain juniper, common lilac, skunkbush sumac	Russian-olive, eastern redcedar, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
38:					
Kimst	Siberian peashrub, Tatarian honeysuckle, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
Canyon.					
39:					
Kimst	Siberian peashrub, Tatarian honeysuckle, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
39:					
Richfield	Nanking cherry, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, Austrian pine, Russian-olive, Scotch pine, common hackberry, green ash, ponderosa pine	Blue spruce	---	---
40:					
Kimst	Siberian peashrub, Tatarian honeysuckle, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
Wages	Skunkbush sumac, Siberian peashrub, common chokecherry, common lilac	Eastern redcedar, honeylocust, Austrian pine, Russian-olive, green ash, ponderosa pine	Blue spruce, Siberian elm	---	---
41:					
Kitcarson	American plum, Nanking cherry	Siberian peashrub	Rocky Mountain juniper, blue spruce, common hackberry, eastern redcedar, ponderosa pine, golden willow, green ash	Siberian elm, plains cottonwood	---
42:					
Kuma	Nanking cherry, Siberian peashrub, common lilac	Eastern redcedar	Austrian pine, Russian-olive, blue spruce, green ash, honeylocust, ponderosa pine	Siberian elm	---
Keith	American plum, Tatarian honeysuckle, common chokecherry, common lilac	Eastern redcedar	Austrian pine, Russian-olive, blue spruce, green ash, honeylocust, ponderosa pine	Siberian elm	---
43:					
Kuma	Nanking cherry, Siberian peashrub, common lilac	Eastern redcedar	Austrian pine, Russian-olive, blue spruce, green ash, honeylocust, ponderosa pine	Siberian elm	---
Keith	American plum, Tatarian honeysuckle, common chokecherry, common lilac	Eastern redcedar	Austrian pine, Russian-olive, blue spruce, green ash, honeylocust, ponderosa pine	Siberian elm	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
44:					
Manter	American plum, Amur honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian mulberry, eastern redcedar	Common hackberry, green ash, ponderosa pine, Siberian elm	---	---
45:					
Manter	American plum, Amur honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian mulberry, eastern redcedar	Common hackberry, green ash, ponderosa pine, Siberian elm	---	---
46:					
Manter	American plum, Amur honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian mulberry, eastern redcedar	Common hackberry, green ash, ponderosa pine, Siberian elm	---	---
47:					
Manter	American plum, Amur honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian mulberry, eastern redcedar	Common hackberry, green ash, ponderosa pine, Siberian elm	---	---
48:					
Manter	American plum, Amur honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian mulberry, eastern redcedar	Common hackberry, green ash, ponderosa pine, Siberian elm	---	---
Ascalon	American plum, Siberian peashrub, common chokecherry, skunkbush sumac	Rocky Mountain juniper, eastern redcedar	Austrian pine, blue spruce, common hackberry, green ash, honeylocust, ponderosa pine	---	---
49:					
Manter	American plum, Amur honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian mulberry, eastern redcedar	Common hackberry, green ash, ponderosa pine, Siberian elm	---	---
Otero	American plum, Nanking cherry, Siberian peashrub, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive, eastern redcedar, green ash, honeylocust, ponderosa pine	---	---	---
50:					
Manzanst	American plum, Siberian peashrub, common chokecherry, common lilac, eastern redcedar	Rocky Mountain juniper, common hackberry, green ash, ponderosa pine, honeylocust	---	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
51: Midway.					
Razor	Siberian peashrub, American plum, Tatarian honeysuckle, common chokecherry, common lilac, eastern redcedar	Rocky Mountain juniper, Russian-olive, green ash, ponderosa pine, honeylocust	Siberian elm	---	---
52: Norka	American plum, Nanking cherry, common chokecherry, common lilac	Eastern redcedar	Austrian pine, Russian-olive, blue spruce, green ash, honeylocust, ponderosa pine	Siberian elm	---
53: Norka	American plum, Nanking cherry, common chokecherry, common lilac	Eastern redcedar	Austrian pine, Russian-olive, blue spruce, green ash, honeylocust, ponderosa pine	Siberian elm	---
54: Norka	American plum, Nanking cherry, common chokecherry, common lilac	Eastern redcedar	Austrian pine, Russian-olive, blue spruce, green ash, honeylocust, ponderosa pine	Siberian elm	---
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
55: Norka	American plum, Nanking cherry, common chokecherry, common lilac	Eastern redcedar	Austrian pine, Russian-olive, blue spruce, green ash, honeylocust, ponderosa pine	Siberian elm	---
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
56: Norka	American plum, Nanking cherry, common chokecherry, common lilac	Eastern redcedar	Austrian pine, Russian-olive, blue spruce, green ash, honeylocust, ponderosa pine	Siberian elm	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
56:					
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
57:					
Norka	Skunkbush sumac, Siberian peashrub, common chokecherry, common lilac	Eastern redcedar, honeylocust, Austrian pine, Russian-olive, green ash, ponderosa pine	Blue spruce, Siberian elm	---	---
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
Weld	American plum, Siberian peashrub, common lilac	Rocky Mountain juniper, Russian-olive, common hackberry, eastern redcedar	Austrian pine, green ash, honeylocust, ponderosa pine, Siberian elm	---	---
58:					
Nunn	American plum, Nanking cherry, Siberian peashrub	Austrian pine, Rocky Mountain juniper, Russian-olive, eastern redcedar, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
59:					
Nunn	Siberian peashrub, American plum, common chokecherry, eastern redcedar	Rocky Mountain juniper, Russian-olive, common hackberry, green ash, ponderosa pine, honeylocust	Siberian elm	---	---
60:					
Olnest	Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, Austrian pine, Scotch pine, ponderosa pine	Russian-olive, blue spruce, common hackberry, green ash	---	---
61:					
Olnest	Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, Austrian pine, Scotch pine, ponderosa pine	Russian-olive, blue spruce, common hackberry, green ash	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
62:					
Olnest	Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, Austrian pine, Scotch pine, ponderosa pine	Russian-olive, blue spruce, common hackberry, green ash	---	---
Ascalon	American plum, Siberian peashrub, common chokecherry, skunkbush sumac	Rocky Mountain juniper, eastern redcedar	Austrian pine, blue spruce, common hackberry, green ash, honeylocust, ponderosa pine	---	---
63:					
Otero	American plum, Nanking cherry, Siberian peashrub, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive, eastern redcedar, green ash, honeylocust, ponderosa pine	---	---	---
64:					
Otero	American plum, Siberian peashrub, common chokecherry, common lilac	Common hackberry, eastern redcedar, osage orange, Austrian pine, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
Olnest	Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, Austrian pine, Scotch pine, ponderosa pine	Russian-olive, blue spruce, common hackberry, green ash	---	---
65:					
Oxyaquic Ustifluvents.					
66:					
Paoli	American plum, Nanking cherry, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, blue spruce, eastern redcedar	Austrian pine, common hackberry, green ash, ponderosa pine	---	---
67:					
Pits, gravel.					
68:					
Platner	American plum, Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, Russian-olive, common hackberry, eastern redcedar	Austrian pine, green ash, ponderosa pine, Siberian elm	---	---
69:					
Pleasant.					

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
70:					
Rago	Skunkbush sumac, Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, Russian mulberry, eastern redcedar, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
71:					
Rago	American plum, Siberian peashrub, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive, common hackberry, eastern redcedar	Green ash, honeylocust, ponderosa pine, Siberian elm	---	---
Weld	American plum, Siberian peashrub, common lilac	Rocky Mountain juniper, Russian-olive, common hackberry, eastern redcedar	Austrian pine, green ash, honeylocust, ponderosa pine, Siberian elm	---	---
72:					
Richfield	American plum, Nanking cherry, common lilac	Rocky Mountain juniper, eastern redcedar	Austrian pine, Russian-olive, Scotch pine, blue spruce, common hackberry, green ash, ponderosa pine	---	---
73:					
Richfield	American plum, Nanking cherry, common lilac	Rocky Mountain juniper, eastern redcedar	Austrian pine, Russian-olive, Scotch pine, blue spruce, common hackberry, green ash, ponderosa pine	---	---
74:					
Richfield	Nanking cherry, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, Austrian pine, Russian-olive, Scotch pine, common hackberry, green ash, ponderosa pine	Blue spruce	---	---
75:					
Sampson	Nanking cherry, skunkbush sumac, Siberian peashrub, common lilac	Rocky Mountain juniper, eastern redcedar, honeylocust, Austrian pine, common hackberry, green ash, ponderosa pine	Siberian elm	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
76:					
Satanta	American plum, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, Austrian pine, Russian-olive, green ash, honeylocust, ponderosa pine	Blue spruce, Siberian elm	---	---
77:					
Satanta	Amur honeysuckle, common lilac	Common chokecherry	Russian-olive, bur oak, common hackberry, eastern redcedar, ponderosa pine, green ash, honeylocust	Siberian elm	---
Colby	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	---	---	---
78:					
Satanta	American plum, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, Austrian pine, Russian-olive, green ash, honeylocust, ponderosa pine	Blue spruce, Siberian elm	---	---
Sampson	Nanking cherry, skunkbush sumac, Siberian peashrub, common lilac	Rocky Mountain juniper, eastern redcedar, honeylocust, Austrian pine, common hackberry, green ash, ponderosa pine	Siberian elm	---	---
79:					
Satanta	American plum, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, Austrian pine, Russian-olive, green ash, honeylocust, ponderosa pine	Blue spruce, Siberian elm	---	---
Ulmet	Nanking cherry, American plum, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive	Austrian pine, honeylocust, ponderosa pine	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
80:					
Stoneham	Skunkbush sumac, Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, honeylocust, Austrian pine, Russian-olive, common hackberry, ponderosa pine	Siberian elm	---	---
81:					
Stoneham	Skunkbush sumac, Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, honeylocust, Austrian pine, Russian-olive, common hackberry, ponderosa pine	Siberian elm	---	---
Fort Collins	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac	Rocky Mountain juniper, Russian mulberry, Austrian pine, Russian-olive, green ash, ponderosa pine	Blue spruce, Siberian elm	---	---
82:					
Stoneham	Skunkbush sumac, Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar, honeylocust, Austrian pine, Russian-olive, common hackberry, ponderosa pine	Siberian elm	---	---
Kimst	Siberian peashrub, Tatarian honeysuckle, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
Fort Collins	Siberian peashrub, Tatarian honeysuckle, common chokecherry, common lilac	Rocky Mountain juniper, Russian mulberry, Austrian pine, Russian-olive, green ash, ponderosa pine	Blue spruce, Siberian elm	---	---
83:					
Ulmet	Nanking cherry, American plum, Tatarian honeysuckle, common chokecherry, common lilac, skunkbush sumac	Rocky Mountain juniper, Russian-olive	Austrian pine, honeylocust, ponderosa pine	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
84: Ulysses	Nanking cherry, Tatarian honeysuckle, common chokecherry, common lilac	Rocky Mountain juniper	Austrian pine, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---
85: Valent	Nanking cherry, Siberian peashrub, Tatarian honeysuckle	Rocky Mountain juniper, eastern redcedar, Austrian pine, Russian-olive, Scotch pine, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
86: Valent.					
87: Valent	Nanking cherry, Siberian peashrub, Tatarian honeysuckle	Rocky Mountain juniper, eastern redcedar, Austrian pine, Russian-olive, Scotch pine, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
88: Valent	Nanking cherry, Siberian peashrub, Tatarian honeysuckle	Rocky Mountain juniper, eastern redcedar, Austrian pine, Russian-olive, Scotch pine, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
89: Vona	American plum, Siberian peashrub, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar	Austrian pine, common hackberry, honeylocust, osage orange, ponderosa pine, Siberian elm	---	---
90: Wages	American plum, Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar	Austrian pine, Scotch pine, blue spruce, common hackberry, green ash, ponderosa pine	---	---
91: Wages	American plum, Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar	Austrian pine, Scotch pine, blue spruce, common hackberry, green ash, ponderosa pine	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
92:					
Wages	American plum, Siberian peashrub, common chokecherry, common lilac	Rocky Mountain juniper, eastern redcedar	Austrian pine, Scotch pine, blue spruce, common hackberry, green ash, ponderosa pine	---	---
93:					
Wages	Skunkbush sumac, Siberian peashrub, common chokecherry, common lilac	Eastern redcedar, honeylocust, Austrian pine, Russian-olive, green ash, ponderosa pine	Blue spruce, Siberian elm	---	---
Kimst	Siberian peashrub, Tatarian honeysuckle, common lilac, skunkbush sumac	Rocky Mountain juniper, eastern redcedar, Russian-olive, common hackberry, green ash, honeylocust, ponderosa pine	Siberian elm	---	---
94:					
Wages	Skunkbush sumac, Siberian peashrub, common chokecherry, common lilac	Eastern redcedar, honeylocust, Austrian pine, Russian-olive, green ash, ponderosa pine	Blue spruce, Siberian elm	---	---
Weld	American plum, Siberian peashrub, common lilac	Rocky Mountain juniper, Russian-olive, common hackberry, eastern redcedar	Austrian pine, green ash, honeylocust, ponderosa pine, Siberian elm	---	---
95:					
Weld	American plum, Siberian peashrub, common lilac	Rocky Mountain juniper, Russian-olive, common hackberry, eastern redcedar	Austrian pine, green ash, honeylocust, ponderosa pine, Siberian elm	---	---
96:					
Weld	American plum, Siberian peashrub, common lilac	Rocky Mountain juniper, Russian-olive, common hackberry, eastern redcedar	Austrian pine, green ash, honeylocust, ponderosa pine, Siberian elm	---	---
Norka	Skunkbush sumac, Siberian peashrub, common chokecherry, common lilac	Eastern redcedar, honeylocust, Austrian pine, Russian-olive, green ash, ponderosa pine	Blue spruce, Siberian elm	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
97: Wiley	Rocky Mountain juniper, Siberian peashrub, skunkbush sumac	Russian-olive, eastern redcedar, green ash, honeylocust, ponderosa pine	Siberian elm	---	---

Table 9a.--Recreation

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1:							
Ascalon	80	Not limited		Not limited		Somewhat limited:	
						Slope	0.05
2:							
Ascalon	85	Not limited		Not limited		Somewhat limited:	
						Slope	0.48
3:							
Ascalon	85	Not limited		Not limited		Very limited:	
						Slope	1.00
4:							
Ascalon	85	Not limited		Not limited		Somewhat limited:	
						Slope	0.05
5:							
Ascalon	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
6:							
Ascalon	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
7:							
Ascalon	85	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Dusty	0.50
8:							
Ascalon	40	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.21
Eckley	30	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.21
9:							
Ascalon	40	Not limited		Not limited		Somewhat limited:	
						Slope	0.05
Haxtun	35	Not limited		Not limited		Somewhat limited:	
						Slope	0.05
10:							
Bayard	80	Not limited		Not limited		Somewhat limited:	
						Slope	0.48

Table 9a.--Recreation--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
11:							
Beckton	85	Very limited:		Very limited:		Very limited:	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Salinity	0.01	Salinity	0.01	Slope	0.48
						Salinity	0.01
12:							
Bethune	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
13:							
Canyon	80	Very limited:		Very limited:		Very limited:	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Gravel content	1.00
		Gravel content	0.09	Gravel content	0.09	Slope	1.00
		Slope	0.04	Slope	0.04	Dusty	0.50
						Content of large stones	0.20
14:							
Canyon	40	Very limited:		Very limited:		Very limited:	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Gravel content	1.00
		Gravel content	0.09	Gravel content	0.09	Dusty	0.50
						Content of large stones	0.20
Rock outcrop	30	Not rated		Not rated		Not rated	
15:							
Colby	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
16:							
Colby	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
17:							
Colby	85	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Dusty	0.50
18:							
Colby	80	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Slope	1.00
						Dusty	0.50
19:							
Colby	85	Not limited		Not limited		Somewhat limited:	
						Slope	0.05

Table 9a.--Recreation--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
20:							
Colby	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
Aridic Ustorthents	40	Very limited:		Very limited:		Very limited:	
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
21:							
Concordia	80	Very limited:		Very limited:		Very limited:	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Flooding	1.00				
22:							
Eckley	40	Somewhat limited:		Somewhat limited:		Very limited:	
		Slope	0.63	Slope	0.63	Gravel content	1.00
		Gravel content	0.32	Gravel content	0.32	Slope	1.00
Wages	30	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Slope	1.00
						Dusty	0.50
23:							
Fort Collins	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
24:							
Glenberg	85	Very limited:		Not limited		Somewhat limited:	
		Flooding	1.00			Slope	0.21
25:							
Glenberg	50	Very limited:		Not limited		Somewhat limited:	
		Flooding	1.00			Slope	0.05
Bankard	30	Very limited:		Somewhat limited:		Somewhat limited:	
		Flooding	1.00	Too sandy	0.12	Flooding	0.60
		Too sandy	0.12			Too sandy	0.12
26:							
Goshen	85	Very limited:		Not limited		Not limited	
		Flooding	1.00				
27:							
Haverson	80	Very limited:		Somewhat limited:		Somewhat limited:	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50	Salinity	0.01	Dusty	0.50
		Salinity	0.01			Salinity	0.01
28:							
Haxtun	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Too sandy	0.28	Too sandy	0.28	Too sandy	0.28
						Slope	0.05

Table 9a.--Recreation--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
29:							
Iliff	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
30:							
Julesburg	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Too sandy	0.28	Too sandy	0.28	Too sandy	0.28
						Slope	0.05
31:							
Julesburg	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Too sandy	0.28	Too sandy	0.28	Slope	0.48
						Too sandy	0.28
32:							
Julesburg	80	Not limited		Not limited		Somewhat limited:	
						Slope	0.05
33:							
Julesburg	85	Not limited		Not limited		Somewhat limited:	
						Slope	0.48
34:							
Julesburg	45	Not limited		Not limited		Somewhat limited:	
						Slope	0.77
Otero	35	Not limited		Not limited		Somewhat limited:	
						Slope	0.77
35:							
Keith	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
36:							
Kimst	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.21
37:							
Kimst	75	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Slope	1.00
						Dusty	0.50
38:							
Kimst	45	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
Canyon	25	Very limited:		Very limited:		Very limited:	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
						Gravel content	0.15
						Content of large stones	0.01

Table 9a.--Recreation--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
39:							
Kimst	45	Not limited		Not limited		Somewhat limited: Slope	0.21
Richfield	30	Not limited		Not limited		Somewhat limited: Slope	0.05
40:							
Kimst	60	Not limited		Not limited		Somewhat limited: Slope	0.48
Wages	20	Not limited		Not limited		Somewhat limited: Slope	0.48
41:							
Kitcarson	85	Very limited: Flooding	1.00	Not limited		Not limited	
42:							
Kuma	45	Not limited		Not limited		Somewhat limited: Slope	0.05
Keith	30	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty Slope	0.50 0.05
43:							
Kuma	45	Not limited		Not limited		Not limited	
Keith	30	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50
44:							
Manter	85	Somewhat limited: Too sandy	0.28	Somewhat limited: Too sandy	0.28	Somewhat limited: Slope Too sandy	0.48 0.28
45:							
Manter	85	Not limited		Not limited		Somewhat limited: Slope	0.05
46:							
Manter	85	Not limited		Not limited		Somewhat limited: Slope	0.48
47:							
Manter	85	Not limited		Not limited		Very limited: Slope	1.00
48:							
Manter	55	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Very limited: Slope	1.00
Ascalon	25	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Very limited: Slope	1.00
49:							
Manter	50	Not limited		Not limited		Somewhat limited: Slope	0.48

Table 9a.--Recreation--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
49:							
Otero	35	Not limited		Not limited		Somewhat limited:	
						Slope	0.48
50:							
Manzanst	85	Very limited:		Somewhat limited:		Somewhat limited:	
		Flooding	1.00	Restricted permeability	0.39	Restricted permeability	0.39
		Restricted permeability	0.39	Slope	0.05		
51:							
Midway	45	Very limited:		Very limited:		Very limited:	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Restricted permeability	0.39	Restricted permeability	0.39	Slope	1.00
		Slope	0.16	Slope	0.16	Restricted permeability	0.39
						Gravel content	0.06
Razor	35	Very limited:		Very limited:		Very limited:	
		Sodium content	1.00	Sodium content	1.00	Slope	1.00
		Restricted permeability	0.39	Restricted permeability	0.39	Sodium content	1.00
		Slope	0.04	Slope	0.04	Depth to bedrock	0.42
						Restricted permeability	0.39
52:							
Norka	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
53:							
Norka	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
54:							
Norka	40	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
Colby	35	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
55:							
Norka	50	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
Colby	35	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
56:							
Norka	60	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Slope	1.00
						Dusty	0.50

Table 9a.--Recreation--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
56:							
Colby	30	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Dusty	0.50
57:							
Norka	35	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
Colby	30	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
Weld	20	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Slope	0.48
						Restricted permeability	0.39
58:							
Nunn	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
						Slope	0.05
59:							
Nunn	75	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
						Slope	0.21
60:							
Olnest	80	Not limited		Not limited		Somewhat limited:	
						Slope	0.48
61:							
Olnest	80	Not limited		Not limited		Very limited:	
						Slope	1.00
62:							
Olnest	40	Not limited		Not limited		Somewhat limited:	
						Slope	0.48
Ascalon	35	Not limited		Not limited		Somewhat limited:	
						Slope	0.48
63:							
Otero	85	Somewhat limited:		Somewhat limited:		Very limited:	
		Slope	0.37	Slope	0.37	Slope	1.00
64:							
Otero	40	Not limited		Not limited		Somewhat limited:	
						Slope	0.77
Olnest	30	Not limited		Not limited		Somewhat limited:	
						Slope	0.77

Table 9a.--Recreation--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
65:							
Oxyaquic Ustifluvents	90	Very limited:		Very limited:		Very limited:	
		Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	0.39	Flooding	0.60
		Restricted permeability	0.39			Restricted permeability	0.39
66:							
Paoli	80	Very limited:		Not limited		Not limited	
		Flooding	1.00				
67:							
Pits, gravel	100	Not rated		Not rated		Not rated	
68:							
Platner	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
						Slope	0.05
69:							
Pleasant	85	Very limited:		Very limited:		Very limited:	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Restricted permeability	0.39	Restricted permeability	0.39		
70:							
Rago	90	Very limited:		Somewhat limited:		Somewhat limited:	
		Flooding	1.00	Restricted permeability	0.39	Flooding	0.60
		Restricted permeability	0.39			Restricted permeability	0.39
71:							
Rago	55	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
Weld	30	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
72:							
Richfield	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
73:							
Richfield	85	Not limited		Not limited		Not limited	
74:							
Richfield	80	Not limited		Not limited		Not limited	
75:							
Sampson	85	Very limited:		Not limited		Not limited	
		Flooding	1.00				

Table 9a.--Recreation--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
76:							
Satanta	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty Slope	0.50 0.05
77:							
Satanta	50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty Slope	0.50 0.48
Colby	20	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty Slope	0.50 0.48
78:							
Satanta	40	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty Slope	0.50 0.05
Sampson	30	Very limited: Flooding	1.00	Not limited		Not limited	
79:							
Satanta	45	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty Slope	0.50 0.05
Ulmet	30	Somewhat limited: Dusty Restricted permeability	0.50 0.39	Somewhat limited: Dusty Restricted permeability	0.50 0.39	Somewhat limited: Dusty Restricted permeability Slope	0.50 0.39 0.05
80:							
Stoneham	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty Slope	0.50 0.05
81:							
Stoneham	50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty Slope	0.50 0.48
Fort Collins	30	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty Slope	0.50 0.48
82:							
Stoneham	40	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Very limited: Slope Dusty	1.00 0.50
Kimst	20	Somewhat limited: Dusty Slope	0.50 0.16	Somewhat limited: Dusty Slope	0.50 0.16	Very limited: Slope Dusty	1.00 0.50
Fort Collins	20	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Very limited: Slope Dusty	1.00 0.50

Table 9a.--Recreation--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
83:							
Ulmet	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
						Slope	0.05
84:							
Ulysses	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
85:							
Valent	85	Very limited:		Very limited:		Very limited:	
		Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
						Slope	0.77
86:							
Valent	90	Very limited:		Very limited:		Very limited:	
		Slope	1.00	Too sandy	1.00	Slope	1.00
		Too sandy	1.00	Slope	1.00	Too sandy	1.00
87:							
Valent	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Too sandy	0.28	Too sandy	0.28	Too sandy	0.28
						Slope	0.21
88:							
Valent	80	Somewhat limited:		Somewhat limited:		Very limited:	
		Too sandy	0.28	Too sandy	0.28	Slope	1.00
		Slope	0.16	Slope	0.16	Too sandy	0.28
89:							
Vona	80	Somewhat limited:		Somewhat limited:		Very limited:	
		Slope	0.16	Slope	0.16	Slope	1.00
90:							
Wages	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
91:							
Wages	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
92:							
Wages	80	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.04	Slope	0.04	Dusty	0.50
93:							
Wages	45	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.21
Kimst	30	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.21

Table 9a.--Recreation--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
94:							
Wages	45	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
Weld	35	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
						Slope	0.05
95:							
Weld	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
96:							
Weld	45	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
						Slope	0.05
Norka	40	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
97:							
Wiley	75	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.05
98:							
Water	100	Not rated		Not rated		Not rated	

Table 9b.--Recreation

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1:							
Ascalon	80	Not limited		Not limited		Not limited	
2:							
Ascalon	85	Not limited		Not limited		Not limited	
3:							
Ascalon	85	Not limited		Not limited		Not limited	
4:							
Ascalon	85	Not limited		Not limited		Not limited	
5:							
Ascalon	80	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
6:							
Ascalon	85	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
7:							
Ascalon	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Slope	0.16
8:							
Ascalon	40	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
Eckley	30	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Droughty	1.00
9:							
Ascalon	40	Not limited		Not limited		Not limited	
Haxtun	35	Not limited		Not limited		Not limited	
10:							
Bayard	80	Not limited		Not limited		Not limited	
11:							
Beckton	85	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Sodium content	1.00
						Droughty	1.00
						Salinity	0.01
12:							
Bethune	85	Not limited		Not limited		Somewhat limited:	
						Depth to bedrock	0.84

Table 9b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
13:							
Canyon	80	Somewhat limited:		Somewhat limited:		Very limited:	
		Dusty	0.50	Dusty	0.50	Droughty	1.00
						Depth to bedrock	1.00
						Content of large stones	0.20
						Gravel content	0.09
						Slope	0.04
14:							
Canyon	40	Very limited:		Somewhat limited:		Very limited:	
		Slope	1.00	Slope	0.56	Droughty	1.00
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
						Slope	1.00
						Content of large stones	0.20
						Gravel content	0.09
Rock outcrop	30	Not rated		Not rated		Not rated	
15:							
Colby	85	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
16:							
Colby	85	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
17:							
Colby	85	Very limited:		Very limited:		Somewhat limited:	
		Water erosion	1.00	Water erosion	1.00	Slope	0.16
		Dusty	0.50	Dusty	0.50		
18:							
Colby	80	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
19:							
Colby	85	Not limited		Not limited		Not limited	
20:							
Colby	45	Very limited:		Very limited:		Very limited:	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50		
		Slope	0.08				
Aridic Ustorthents	40	Very limited:		Very limited:		Very limited:	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50		
		Slope	0.08				
21:							
Concordia	80	Not limited		Not limited		Very limited:	
						Sodium content	1.00
						Droughty	1.00

Table 9b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
22:							
Eckley	40	Not limited		Not limited		Very limited:	
						Droughty	1.00
						Slope	0.63
						Gravel content	0.32
Wages	30	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
23:							
Fort Collins	85	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
24:							
Glenberg	85	Not limited		Not limited		Not limited	
25:							
Glenberg	50	Not limited		Not limited		Not limited	
Bankard	30	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Too sandy	0.12	Too sandy	0.12	Droughty	0.69
						Flooding	0.60
26:							
Goshen	85	Not limited		Not limited		Not limited	
27:							
Haverson	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
						Salinity	0.01
28:							
Haxtun	85	Somewhat limited:		Somewhat limited:		Not limited	
		Too sandy	0.28	Too sandy	0.28		
29:							
Iliff	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Dusty	0.50	Dusty	0.50	Depth to bedrock	0.06
30:							
Julesburg	80	Somewhat limited:		Somewhat limited:		Not limited	
		Too sandy	0.28	Too sandy	0.28		
31:							
Julesburg	85	Somewhat limited:		Somewhat limited:		Not limited	
		Too sandy	0.28	Too sandy	0.28		
32:							
Julesburg	80	Not limited		Not limited		Not limited	
33:							
Julesburg	85	Not limited		Not limited		Not limited	
34:							
Julesburg	45	Not limited		Not limited		Not limited	
Otero	35	Not limited		Not limited		Not limited	

Table 9b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
35:							
Keith	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
36:							
Kimst	85	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
37:							
Kimst	75	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
38:							
Kimst	45	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
Canyon	25	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Very limited: Droughty Depth to bedrock Content of large stones	1.00 1.00 0.01
39:							
Kimst	45	Not limited		Not limited		Not limited	
Richfield	30	Not limited		Not limited		Not limited	
40:							
Kimst	60	Not limited		Not limited		Not limited	
Wages	20	Not limited		Not limited		Not limited	
41:							
Kitcarson	85	Not limited		Not limited		Not limited	
42:							
Kuma	45	Not limited		Not limited		Not limited	
Keith	30	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
43:							
Kuma	45	Not limited		Not limited		Not limited	
Keith	30	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
44:							
Manter	85	Somewhat limited: Too sandy	0.28	Somewhat limited: Too sandy	0.28	Not limited	
45:							
Manter	85	Not limited		Not limited		Not limited	
46:							
Manter	85	Not limited		Not limited		Not limited	
47:							
Manter	85	Not limited		Not limited		Not limited	

Table 9b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
48:							
Manter	55	Not limited		Not limited		Somewhat limited:	
						Slope	0.16
Ascalon	25	Not limited		Not limited		Somewhat limited:	
						Slope	0.16
49:							
Manter	50	Not limited		Not limited		Not limited	
Otero	35	Not limited		Not limited		Not limited	
50:							
Manzanst	85	Not limited		Not limited		Not limited	
51:							
Midway	45	Not limited		Not limited		Very limited:	
						Depth to bedrock	1.00
						Droughty	0.92
						Slope	0.16
Razor	35	Not limited		Not limited		Very limited:	
						Sodium content	1.00
						Depth to bedrock	0.42
						Slope	0.04
52:							
Norka	80	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
53:							
Norka	80	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
54:							
Norka	40	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
Colby	35	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
55:							
Norka	50	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
Colby	35	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
56:							
Norka	60	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		
Colby	30	Very limited:		Very limited:		Somewhat limited:	
		Water erosion	1.00	Water erosion	1.00	Slope	0.16
		Dusty	0.50	Dusty	0.50		
57:							
Norka	35	Somewhat limited:		Somewhat limited:		Not limited	
		Dusty	0.50	Dusty	0.50		

Table 9b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
57:							
Colby	30	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
Weld	20	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
58:							
Nunn	80	Not limited		Not limited		Not limited	
59:							
Nunn	75	Not limited		Not limited		Not limited	
60:							
Olnest	80	Not limited		Not limited		Not limited	
61:							
Olnest	80	Not limited		Not limited		Not limited	
62:							
Olnest	40	Not limited		Not limited		Not limited	
Ascalon	35	Not limited		Not limited		Not limited	
63:							
Otero	85	Not limited		Not limited		Somewhat limited: Slope	0.37
64:							
Otero	40	Not limited		Not limited		Not limited	
Olnest	30	Not limited		Not limited		Not limited	
65:							
Oxyaquic Ustifluvents	90	Very limited: Depth to saturated zone	1.00	Very limited: Depth to saturated zone	1.00	Very limited: Depth to saturated zone Flooding	1.00 0.60
66:							
Paoli	80	Not limited		Not limited		Not limited	
67:							
Pits, gravel	100	Not rated		Not rated		Not rated	
68:							
Platner	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
69:							
Pleasant	85	Very limited: Depth to saturated zone Ponding	1.00 1.00	Very limited: Depth to saturated zone Ponding	1.00 1.00	Very limited: Ponding Depth to saturated zone	1.00 1.00

Table 9b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
70:							
Rago	90	Not limited		Not limited		Somewhat limited: Flooding	0.60
71:							
Rago	55	Not limited		Not limited		Not limited	
Weld	30	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
72:							
Richfield	85	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
73:							
Richfield	85	Not limited		Not limited		Not limited	
74:							
Richfield	80	Not limited		Not limited		Not limited	
75:							
Sampson	85	Not limited		Not limited		Not limited	
76:							
Satanta	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
77:							
Satanta	50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
Colby	20	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
78:							
Satanta	40	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
Sampson	30	Not limited		Not limited		Not limited	
79:							
Satanta	45	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
Ulmet	30	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
80:							
Stoneham	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
81:							
Stoneham	50	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
Fort Collins	30	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	

Table 9b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
82:							
Stoneham	40	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
Kimst	20	Very limited: Water erosion Dusty	1.00 0.50	Very limited: Water erosion Dusty	1.00 0.50	Somewhat limited: Slope	0.16
Fort Collins	20	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
83:							
Ulmet	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
84:							
Ulysses	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
85:							
Valent	85	Very limited: Too sandy	1.00	Very limited: Too sandy	1.00	Somewhat limited: Droughty Too sandy	0.69 0.50
86:							
Valent	90	Very limited: Too sandy Slope	1.00 1.00	Very limited: Too sandy Slope	1.00 0.22	Very limited: Slope Droughty Too sandy	1.00 0.69 0.50
87:							
Valent	80	Somewhat limited: Too sandy	0.28	Somewhat limited: Too sandy	0.28	Somewhat limited: Droughty	0.69
88:							
Valent	80	Somewhat limited: Too sandy	0.28	Somewhat limited: Too sandy	0.28	Somewhat limited: Droughty Slope	0.69 0.16
89:							
Vona	80	Not limited		Not limited		Somewhat limited: Slope	0.16
90:							
Wages	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
91:							
Wages	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
92:							
Wages	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Somewhat limited: Slope	0.04
93:							
Wages	45	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	

Table 9b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
93:							
Kimst	30	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
94:							
Wages	45	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
Weld	35	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
95:							
Weld	80	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
96:							
Weld	45	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
Norka	40	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
97:							
Wiley	75	Somewhat limited: Dusty	0.50	Somewhat limited: Dusty	0.50	Not limited	
98:							
Water	100	Not rated		Not rated		Not rated	

Table 10.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
1:												
Ascalon	Fair	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
2:												
Ascalon	Fair	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
3:												
Ascalon	Poor	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
4:												
Ascalon	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
5:												
Ascalon	Fair	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
6:												
Ascalon	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
7:												
Ascalon	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
8:												
Ascalon	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Eckley	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
9:												
Ascalon	Fair	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Haxtun	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
10:												
Bayard	Poor	Poor	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
11:												
Beckton	Poor	Poor	Very poor	---	---	Poor	Poor	Very poor	Poor	---	Very poor	Very poor
12:												
Bethune	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
13:												
Canyon	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
14:												
Canyon	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Rock outcrop	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
15:												
Colby	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
16:												
Colby	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
17:												
Colby	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
18:												
Colby	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
19:												
Colby	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
20:												
Colby	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Aridic Ustorthents	Very poor	Very poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
21:												
Concordia	Very poor	Very poor	Very poor	---	---	Fair	Poor	Fair	Very poor	---	Poor	Very poor
22:												
Eckley	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Wages	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
23:												
Fort Collins	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
24:												
Glenberg	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
25:												
Glenberg	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Bankard	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Poor
26:												
Goshen	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
27:												
Haverson	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
28:												
Haxtun	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
29:												
Iliff	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
30:												
Julesburg	Fair	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
31:												
Julesburg	Fair	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
32:												
Julesburg	Fair	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
33:												
Julesburg	Fair	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
34:												
Julesburg	Poor	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Otero	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
35:												
Keith	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
36:												
Kimst	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
37:												
Kimst	Poor	Fair	Fair	---	---	---	Very poor	Very poor	Fair	---	Very poor	Good
38:												
Kimst	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Canyon	Poor	Poor	Fair	Poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Poor
39:												
Kimst	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Richfield	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
40:												
Kimst	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Wages	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
41:												
Kitcarson	Fair	Good	Good	---	---	Fair	Fair	Fair	Good	---	Fair	Fair
42:												
Kuma	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Keith	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
43:												
Kuma	Good	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Keith	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
44:												
Manter	Fair	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
45:												
Manter	Fair	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
46:												
Manter	Fair	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
47:												
Manter	Poor	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
48:												
Manter	Poor	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Ascalon	Fair	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
49:												
Manter	Fair	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Otero	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
50:												
Manzanst	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
51:												
Midway	Very poor	Very poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
51:												
Razor	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
52:												
Norka	Fair	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
53:												
Norka	Fair	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
54:												
Norka	Fair	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Colby	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
55:												
Norka	Fair	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Colby	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
56:												
Norka	Poor	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Colby	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
57:												
Norka	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Colby	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Weld	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
58:												
Nunn	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
59:												
Nunn	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
60:												
Olnest	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
61:												
Olnest	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
62:												
Olnest	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
62:												
Ascalon	Fair	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
63:												
Otero	Poor	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
64:												
Otero	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Poor	---	Very poor	Fair
Olnest	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
65:												
Oxyaquic Ustifluvents	Poor	Poor	Fair	---	---	Poor	Good	Good	Poor	---	Good	Poor
66:												
Paoli	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
67:												
Pits, gravel	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
68:												
Platner	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
69:												
Pleasant	Poor	Fair	Fair	---	---	Fair	Poor	Poor	Fair	---	Poor	Fair
70:												
Rago	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
71:												
Rago	Good	Good	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Weld	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
72:												
Richfield	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
73:												
Richfield	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
74:												
Richfield	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
75:												
Sampson	Fair	Fair	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Fair

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
76:												
Satanta	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
77:												
Satanta	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Colby	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
78:												
Satanta	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Sampson	Fair	Fair	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Fair
79:												
Satanta	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Ulmet	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
80:												
Stoneham	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
81:												
Stoneham	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Fort Collins	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
82:												
Stoneham	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Kimst	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Fort Collins	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
83:												
Ulmet	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
84:												
Ulysses	Good	Good	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
85:												
Valent	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
86:												
Valent	Very poor	Very poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
87:												
Valent	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
88:												
Valent	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
89:												
Vona	Poor	Poor	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
90:												
Wages	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
91:												
Wages	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
92:												
Wages	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
93:												
Wages	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Kimst	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
94:												
Wages	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Weld	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
95:												
Weld	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
96:												
Weld	Fair	Fair	Good	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Norka	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
97:												
Wiley	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair

Table 11a.--Building Site Development

(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
1:							
Ascalon	80	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
2:							
Ascalon	85	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
3:							
Ascalon	85	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Slope Shrink-swell	0.86 0.50
4:							
Ascalon	85	Not limited		Not limited		Not limited	
5:							
Ascalon	80	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
6:							
Ascalon	85	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
7:							
Ascalon	85	Somewhat limited: Shrink-swell Slope	0.50 0.16	Somewhat limited: Shrink-swell Slope	0.50 0.16	Very limited: Slope Shrink-swell	1.00 0.50
8:							
Ascalon	40	Somewhat limited: Shrink-swell	0.50	Not limited		Somewhat limited: Shrink-swell	0.50
Eckley	30	Not limited		Not limited		Not limited	
9:							
Ascalon	40	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
Haxtun	35	Not limited		Not limited		Not limited	
10:							
Bayard	80	Not limited		Not limited		Not limited	
11:							
Beckton	85	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
12:							
Bethune	85	Not limited		Somewhat limited: Depth to soft bedrock	0.84	Not limited	

Table 11a.--Building Site Development--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
13:							
Canyon	80	Somewhat limited: Depth to soft bedrock; Slope	1.00; 0.04	Very limited: Depth to soft bedrock; Slope	1.00; 0.04	Very limited: Slope; Depth to soft bedrock	1.00; 1.00
14:							
Canyon	40	Very limited: Slope; Depth to soft bedrock	1.00; 1.00	Very limited: Depth to soft bedrock; Slope	1.00; 1.00	Very limited: Slope; Depth to soft bedrock	1.00; 1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
15:							
Colby	85	Not limited		Not limited		Not limited	
16:							
Colby	85	Not limited		Not limited		Not limited	
17:							
Colby	85	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Very limited: Slope	1.00
18:							
Colby	80	Not limited		Not limited		Very limited: Slope	1.00
19:							
Colby	85	Not limited		Not limited		Not limited	
20:							
Colby	45	Very limited: Slope	1.00	Very limited: Slope	1.00	Very limited: Slope	1.00
Aridic Ustorthents	40	Very limited: Slope	1.00	Very limited: Slope	1.00	Very limited: Slope	1.00
21:							
Concordia	80	Very limited: Flooding; Shrink-swell	1.00; 0.50	Very limited: Flooding; Depth to saturated zone; Shrink-swell	1.00; 0.61; 0.50	Very limited: Flooding; Shrink-swell	1.00; 0.50
22:							
Eckley	40	Somewhat limited: Slope	0.63	Somewhat limited: Slope	0.63	Very limited: Slope	1.00
Wages	30	Not limited		Not limited		Very limited: Slope	1.00
23:							
Fort Collins	85	Not limited		Not limited		Not limited	

Table 11a.--Building Site Development--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
24:							
Glenberg	85	Very limited: Flooding	1.00	Very limited: Flooding	1.00	Very limited: Flooding	1.00
25:							
Glenberg	50	Very limited: Flooding	1.00	Very limited: Flooding	1.00	Very limited: Flooding	1.00
Bankard	30	Very limited: Flooding	1.00	Very limited: Flooding	1.00	Very limited: Flooding	1.00
26:							
Goshen	85	Very limited: Flooding Shrink-swell	1.00 0.50	Very limited: Flooding Shrink-swell	1.00 0.50	Very limited: Flooding Shrink-swell	1.00 0.50
27:							
Haverson	80	Very limited: Flooding	1.00	Very limited: Flooding	1.00	Very limited: Flooding	1.00
28:							
Haxtun	85	Not limited		Not limited		Not limited	
29:							
Iliff	80	Somewhat limited: Shrink-swell Depth to hard bedrock	0.78 0.06	Very limited: Depth to hard bedrock Shrink-swell	1.00 0.78	Somewhat limited: Shrink-swell Depth to hard bedrock	0.78 0.06
30:							
Julesburg	80	Not limited		Not limited		Not limited	
31:							
Julesburg	85	Not limited		Not limited		Not limited	
32:							
Julesburg	80	Not limited		Not limited		Not limited	
33:							
Julesburg	85	Not limited		Not limited		Not limited	
34:							
Julesburg	45	Not limited		Not limited		Somewhat limited: Slope	0.12
Otero	35	Not limited		Not limited		Somewhat limited: Slope	0.12
35:							
Keith	80	Not limited		Not limited		Not limited	
36:							
Kimst	85	Not limited		Not limited		Not limited	
37:							
Kimst	75	Not limited		Not limited		Very limited: Slope	1.00

Table 11a.--Building Site Development--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
38:							
Kimst	45	Not limited		Not limited		Not limited	
Canyon	25	Somewhat limited: Depth to soft bedrock	1.00	Very limited: Depth to soft bedrock	1.00	Somewhat limited: Depth to soft bedrock	1.00
39:							
Kimst	45	Not limited		Not limited		Not limited	
Richfield	30	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
40:							
Kimst	60	Not limited		Not limited		Not limited	
Wages	20	Not limited		Not limited		Not limited	
41:							
Kitcarson	85	Very limited: Flooding	1.00	Very limited: Flooding Depth to saturated zone	1.00 1.00	Very limited: Flooding	1.00
42:							
Kuma	45	Not limited		Not limited		Not limited	
Keith	30	Not limited		Not limited		Not limited	
43:							
Kuma	45	Not limited		Not limited		Not limited	
Keith	30	Not limited		Not limited		Not limited	
44:							
Manter	85	Not limited		Not limited		Not limited	
45:							
Manter	85	Not limited		Not limited		Not limited	
46:							
Manter	85	Not limited		Not limited		Not limited	
47:							
Manter	85	Not limited		Not limited		Somewhat limited: Slope	0.86
48:							
Manter	55	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Very limited: Slope	1.00
Ascalon	25	Somewhat limited: Shrink-swell Slope	0.50 0.16	Somewhat limited: Shrink-swell Slope	0.50 0.16	Very limited: Slope Shrink-swell	1.00 0.50
49:							
Manter	50	Not limited		Not limited		Not limited	
Otero	35	Not limited		Not limited		Not limited	

Table 11a.--Building Site Development--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
50:							
Manzanst	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
51:							
Midway	45	Very limited:		Very limited:		Very limited:	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	0.16	Slope	0.16	Depth to soft bedrock	1.00
Razor	35	Very limited:		Very limited:		Very limited:	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.04	Depth to soft bedrock	0.42	Slope	1.00
				Slope	0.04		
52:							
Norka	80	Somewhat limited:		Not limited		Somewhat limited:	
		Shrink-swell	0.50			Shrink-swell	0.50
53:							
Norka	80	Somewhat limited:		Not limited		Somewhat limited:	
		Shrink-swell	0.50			Shrink-swell	0.50
54:							
Norka	40	Somewhat limited:		Not limited		Somewhat limited:	
		Shrink-swell	0.50			Shrink-swell	0.50
Colby	35	Not limited		Not limited		Not limited	
55:							
Norka	50	Not limited		Not limited		Not limited	
Colby	35	Not limited		Not limited		Not limited	
56:							
Norka	60	Not limited		Not limited		Somewhat limited:	
						Slope	0.86
Colby	30	Somewhat limited:		Somewhat limited:		Very limited:	
		Slope	0.16	Slope	0.16	Slope	1.00
57:							
Norka	35	Not limited		Not limited		Not limited	
Colby	30	Not limited		Not limited		Not limited	
Weld	20	Not limited		Not limited		Not limited	
58:							
Nunn	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
59:							
Nunn	75	Not limited		Not limited		Not limited	

Table 11a.--Building Site Development--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
60:							
Olnest	80	Not limited		Not limited		Not limited	
61:							
Olnest	80	Not limited		Not limited		Very limited: Slope	1.00
62:							
Olnest	40	Not limited		Not limited		Not limited	
Ascalon	35	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
63:							
Otero	85	Somewhat limited: Slope	0.37	Somewhat limited: Slope	0.37	Very limited: Slope	1.00
64:							
Otero	40	Not limited		Not limited		Somewhat limited: Slope	0.12
Olnest	30	Not limited		Not limited		Somewhat limited: Slope	0.12
65:							
Oxyaquic Ustifluvents	90	Very limited: Flooding Depth to saturated zone	1.00 1.00	Very limited: Flooding Depth to saturated zone	1.00 1.00	Very limited: Flooding Depth to saturated zone	1.00 1.00
66:							
Paoli	80	Very limited: Flooding	1.00	Very limited: Flooding	1.00	Very limited: Flooding	1.00
67:							
Pits, gravel	100	Not rated		Not rated		Not rated	
68:							
Platner	80	Not limited		Not limited		Not limited	
69:							
Pleasant	85	Very limited: Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited: Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited: Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
70:							
Rago	90	Very limited: Flooding Shrink-swell	1.00 0.50	Very limited: Flooding Shrink-swell	1.00 0.50	Very limited: Flooding Shrink-swell	1.00 0.50
71:							
Rago	55	Somewhat limited: Shrink-swell	0.50	Not limited		Somewhat limited: Shrink-swell	0.50
Weld	30	Not limited		Not limited		Not limited	

Table 11a.--Building Site Development--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
72:							
Richfield	85	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
73:							
Richfield	85	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
74:							
Richfield	80	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
75:							
Sampson	85	Very limited: Flooding Shrink-swell	1.00 0.50	Very limited: Flooding	1.00	Very limited: Flooding Shrink-swell	1.00 0.50
76:							
Satanta	80	Somewhat limited: Shrink-swell	0.50	Not limited		Somewhat limited: Shrink-swell	0.50
77:							
Satanta	50	Not limited		Not limited		Not limited	
Colby	20	Not limited		Not limited		Not limited	
78:							
Satanta	40	Somewhat limited: Shrink-swell	0.50	Not limited		Somewhat limited: Shrink-swell	0.50
Sampson	30	Very limited: Flooding Shrink-swell	1.00 0.50	Very limited: Flooding	1.00	Very limited: Flooding Shrink-swell	1.00 0.50
79:							
Satanta	45	Somewhat limited: Shrink-swell	0.50	Not limited		Somewhat limited: Shrink-swell	0.50
Ulmet	30	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
80:							
Stoneham	80	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
81:							
Stoneham	50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
Fort Collins	30	Not limited		Not limited		Not limited	
82:							
Stoneham	40	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Slope Shrink-swell	0.86 0.50
Kimst	20	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Very limited: Slope	1.00

Table 11a.--Building Site Development--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
82:							
Fort Collins	20	Not limited		Not limited		Somewhat limited: Slope	0.86
83:							
Ulmet	80	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Shrink-swell	0.50
84:							
Ulysses	80	Not limited		Not limited		Not limited	
85:							
Valent	85	Not limited		Not limited		Somewhat limited: Slope	0.12
86:							
Valent	90	Very limited: Slope	1.00	Very limited: Slope	1.00	Very limited: Slope	1.00
87:							
Valent	80	Not limited		Not limited		Not limited	
88:							
Valent	80	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Very limited: Slope	1.00
89:							
Vona	80	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Very limited: Slope	1.00
90:							
Wages	80	Not limited		Not limited		Not limited	
91:							
Wages	80	Not limited		Not limited		Not limited	
92:							
Wages	80	Somewhat limited: Slope	0.04	Somewhat limited: Slope	0.04	Very limited: Slope	1.00
93:							
Wages	45	Not limited		Not limited		Not limited	
Kimst	30	Not limited		Not limited		Not limited	
94:							
Wages	45	Not limited		Not limited		Not limited	
Weld	35	Not limited		Not limited		Not limited	
95:							
Weld	80	Not limited		Not limited		Not limited	
96:							
Weld	45	Not limited		Not limited		Not limited	
Norka	40	Somewhat limited: Shrink-swell	0.50	Not limited		Somewhat limited: Shrink-swell	0.50

Table 11a.--Building Site Development--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
97:							
Wiley	75	Not limited		Not limited		Not limited	
98:							
Water	100	Not rated		Not rated		Not rated	

Table 11b.--Building Site Development

(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
1:							
Ascalon	80	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
2:							
Ascalon	85	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
3:							
Ascalon	85	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
4:							
Ascalon	85	Somewhat limited:		Somewhat limited:		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
5:							
Ascalon	80	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
6:							
Ascalon	85	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
7:							
Ascalon	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Shrink-swell	0.50	Slope	0.16	Slope	0.16
		Frost action	0.50	Cutbanks cave	0.10		
		Slope	0.16				
8:							
Ascalon	40	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Eckley	30	Not limited		Very limited:		Very limited:	
				Cutbanks cave	1.00	Droughty	1.00
9:							
Ascalon	40	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Haxtun	35	Somewhat limited:		Very limited:		Not limited	
		Frost action	0.50	Cutbanks cave	1.00		

Table 11b.--Building Site Development--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
10:							
Bayard	80	Somewhat limited: Frost action	0.50	Very limited: Cutbanks cave	1.00	Not limited	
11:							
Beckton	85	Very limited: Low strength	1.00	Somewhat limited: Cutbanks cave	0.10	Very limited: Sodium content	1.00
		Shrink-swell	0.50			Droughty	1.00
						Salinity	0.01
12:							
Bethune	85	Somewhat limited: Frost action	0.50	Very limited: Cutbanks cave	1.00	Somewhat limited: Depth to bedrock	0.84
				Depth to soft bedrock	0.84		
				Too clayey	0.03		
13:							
Canyon	80	Somewhat limited: Depth to soft bedrock	1.00	Very limited: Depth to soft bedrock	1.00	Very limited: Droughty	1.00
		Slope	0.04	Cutbanks cave	0.10	Depth to bedrock	1.00
				Slope	0.04	Content of large stones	0.20
						Gravel content	0.09
						Slope	0.04
14:							
Canyon	40	Very limited: Slope	1.00	Very limited: Depth to soft bedrock	1.00	Very limited: Droughty	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
				Cutbanks cave	0.10	Slope	1.00
						Content of large stones	0.20
						Gravel content	0.09
Rock outcrop	30	Not rated		Not rated		Not rated	
15:							
Colby	85	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
16:							
Colby	85	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
17:							
Colby	85	Somewhat limited: Frost action	0.50	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16
		Slope	0.16	Cutbanks cave	0.10		
18:							
Colby	80	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	

Table 11b.--Building Site Development--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
19:							
Colby	85	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
20:							
Colby	45	Very limited: Slope	1.00	Very limited: Slope	1.00	Very limited: Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10		
Aridic Ustorthents	40	Very limited: Slope	1.00	Very limited: Slope	1.00	Very limited: Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10		
21:							
Concordia	80	Very limited: Low strength	1.00	Somewhat limited: Depth to saturated zone	0.61	Very limited: Sodium content	1.00
		Shrink-swell	0.50			Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10		
		Flooding	0.40	Too clayey	0.03		
22:							
Eckley	40	Somewhat limited: Slope	0.63	Very limited: Cutbanks cave	1.00	Very limited: Droughty	1.00
				Slope	0.63	Slope	0.63
						Gravel content	0.32
Wages	30	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
23:							
Fort Collins	85	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
24:							
Glenberg	85	Somewhat limited: Flooding	0.40	Somewhat limited: Cutbanks cave	0.10	Not limited	
25:							
Glenberg	50	Somewhat limited: Flooding	0.40	Very limited: Cutbanks cave	1.00	Not limited	
Bankard	30	Very limited: Flooding	1.00	Very limited: Cutbanks cave	1.00	Somewhat limited: Droughty	0.69
				Flooding	0.60	Flooding	0.60
				Depth to dense layer	0.50		
26:							
Goshen	85	Very limited: Low strength	1.00	Somewhat limited: Cutbanks cave	0.10	Not limited	
		Shrink-swell	0.50				
		Frost action	0.50				
		Flooding	0.40				
27:							
Haverson	80	Very limited: Flooding	1.00	Very limited: Cutbanks cave	1.00	Somewhat limited: Flooding	0.60
				Flooding	0.60	Salinity	0.01

Table 11b.--Building Site Development--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
28:							
Haxtun	85	Somewhat limited: Frost action	0.50	Very limited: Cutbanks cave	1.00	Not limited	
29:							
Iliff	80	Somewhat limited: Shrink-swell	0.78	Very limited: Depth to hard bedrock	1.00	Somewhat limited: Depth to bedrock	0.06
		Frost action	0.50	Cutbanks cave	0.10		
		Depth to hard bedrock	0.06	Too clayey	0.03		
30:							
Julesburg	80	Somewhat limited: Frost action	0.50	Very limited: Cutbanks cave	1.00	Not limited	
31:							
Julesburg	85	Somewhat limited: Frost action	0.50	Very limited: Cutbanks cave	1.00	Not limited	
32:							
Julesburg	80	Somewhat limited: Frost action	0.50	Very limited: Cutbanks cave	1.00	Not limited	
33:							
Julesburg	85	Somewhat limited: Frost action	0.50	Very limited: Cutbanks cave	1.00	Not limited	
34:							
Julesburg	45	Somewhat limited: Frost action	0.50	Very limited: Cutbanks cave	1.00	Not limited	
Otero	35	Not limited		Very limited: Cutbanks cave	1.00	Not limited	
35:							
Keith	80	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
36:							
Kimst	85	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
37:							
Kimst	75	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
38:							
Kimst	45	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
Canyon	25	Somewhat limited: Depth to soft bedrock	1.00	Very limited: Depth to soft bedrock	1.00	Very limited: Droughty	1.00
				Cutbanks cave	0.10	Depth to bedrock	1.00
						Content of large stones	0.01

Table 11b.--Building Site Development--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
39:							
Kimst	45	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
Richfield	30	Very limited: Low strength; Shrink-swell	1.00; 0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
40:							
Kimst	60	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
Wages	20	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
41:							
Kitcarson	85	Somewhat limited: Frost action; Flooding	0.50; 0.40	Very limited: Depth to saturated zone; Cutbanks cave	1.00; 0.10	Not limited	
42:							
Kuma	45	Very limited: Low strength	1.00	Somewhat limited: Cutbanks cave	0.10	Not limited	
Keith	30	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
43:							
Kuma	45	Very limited: Low strength	1.00	Somewhat limited: Cutbanks cave	0.10	Not limited	
Keith	30	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
44:							
Manter	85	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
45:							
Manter	85	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
46:							
Manter	85	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
47:							
Manter	85	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
48:							
Manter	55	Somewhat limited: Frost action; Slope	0.50; 0.16	Somewhat limited: Slope; Cutbanks cave	0.16; 0.10	Somewhat limited: Slope	0.16

Table 11b.--Building Site Development--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
48:							
Ascalon	25	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Shrink-swell	0.50	Slope	0.16	Slope	0.16
		Frost action	0.50	Cutbanks cave	0.10		
		Slope	0.16				
49:							
Manter	50	Somewhat limited:		Somewhat limited:		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Otero	35	Not limited		Somewhat limited:		Not limited	
				Cutbanks cave	0.10		
50:							
Manzanst	85	Very limited:		Somewhat limited:		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50	Too clayey	0.03		
		Flooding	0.40				
51:							
Midway	45	Very limited:		Very limited:		Very limited:	
		Low strength	1.00	Depth to soft		Depth to bedrock	1.00
		Shrink-swell	1.00	bedrock	1.00	Droughty	0.91
		Depth to soft		Slope	0.16	Slope	0.16
		bedrock	1.00	Cutbanks cave	0.10		
		Slope	0.16				
Razor	35	Very limited:		Somewhat limited:		Very limited:	
		Shrink-swell	1.00	Depth to soft		Sodium content	1.00
		Low strength	1.00	bedrock	0.42	Depth to bedrock	0.42
		Slope	0.04	Too clayey	0.28	Slope	0.04
				Cutbanks cave	0.10		
				Slope	0.04		
52:							
Norka	80	Very limited:		Somewhat limited:		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
53:							
Norka	80	Very limited:		Somewhat limited:		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
54:							
Norka	40	Very limited:		Somewhat limited:		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Colby	35	Somewhat limited:		Somewhat limited:		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
55:							
Norka	50	Somewhat limited:		Somewhat limited:		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		

Table 11b.--Building Site Development--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
55:							
Colby	35	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
56:							
Norka	60	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
Colby	30	Somewhat limited: Frost action Slope	0.50 0.16	Somewhat limited: Slope Cutbanks cave	0.16 0.10	Somewhat limited: Slope	0.16
57:							
Norka	35	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
Colby	30	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
Weld	20	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
58:							
Nunn	80	Somewhat limited: Shrink-swell Frost action Low strength	0.50 0.50 0.22	Somewhat limited: Cutbanks cave	0.10	Not limited	
59:							
Nunn	75	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
60:							
Olnest	80	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
61:							
Olnest	80	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
62:							
Olnest	40	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
Ascalon	35	Somewhat limited: Shrink-swell Frost action	0.50 0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
63:							
Otero	85	Somewhat limited: Slope	0.37	Very limited: Cutbanks cave Slope	1.00 0.37	Somewhat limited: Slope	0.37
64:							
Otero	40	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
Olnest	30	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	

Table 11b.--Building Site Development--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
65:							
Oxyaquic Ustifluvents	90	Very limited:		Very limited:		Very limited:	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
		Depth to saturated zone	1.00	Flooding	0.60		
66:							
Paoli	80	Somewhat limited:		Somewhat limited:		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
		Flooding	0.40				
67:							
Pits, gravel	100	Not rated		Not rated		Not rated	
68:							
Platner	80	Not limited		Somewhat limited:		Not limited	
				Cutbanks cave	0.10		
69:							
Pleasant	85	Very limited:		Very limited:		Very limited:	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Too clayey	0.36		
		Shrink-swell	1.00	Cutbanks cave	0.10		
70:							
Rago	90	Very limited:		Somewhat limited:		Somewhat limited:	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
71:							
Rago	55	Very limited:		Somewhat limited:		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Weld	30	Not limited		Somewhat limited:		Not limited	
				Cutbanks cave	0.10		
72:							
Richfield	85	Very limited:		Somewhat limited:		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
73:							
Richfield	85	Very limited:		Somewhat limited:		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
74:							
Richfield	80	Very limited:		Somewhat limited:		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				

Table 11b.--Building Site Development--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
75:							
Sampson	85	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Flooding	0.40				
		Low strength	0.22				
76:							
Satanta	80	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Low strength	0.22				
77:							
Satanta	50	Somewhat limited:		Somewhat limited:		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Colby	20	Somewhat limited:		Somewhat limited:		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
78:							
Satanta	40	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Low strength	0.22				
Sampson	30	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Flooding	0.40				
		Low strength	0.22				
79:							
Satanta	45	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Low strength	0.22				
Ulmet	30	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
80:							
Stoneham	80	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
81:							
Stoneham	50	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
Fort Collins	30	Not limited		Somewhat limited:		Not limited	
				Cutbanks cave	0.10		
82:							
Stoneham	40	Somewhat limited:		Somewhat limited:		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
Kimst	20	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Slope	0.16	Slope	0.16	Slope	0.16
				Cutbanks cave	0.10		

Table 11b.--Building Site Development--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
82:							
Fort Collins	20	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
83:							
Ulmet	80	Somewhat limited: Shrink-swell	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
84:							
Ulysses	80	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
85:							
Valent	85	Not limited		Very limited: Cutbanks cave	1.00	Somewhat limited: Droughty Too sandy	0.69 0.50
86:							
Valent	90	Very limited: Slope	1.00	Very limited: Slope Cutbanks cave	1.00 1.00	Very limited: Slope Droughty Too sandy	1.00 0.69 0.50
87:							
Valent	80	Not limited		Very limited: Cutbanks cave	1.00	Somewhat limited: Droughty	0.69
88:							
Valent	80	Somewhat limited: Slope	0.16	Very limited: Cutbanks cave Slope	1.00 0.16	Somewhat limited: Droughty Slope	0.69 0.16
89:							
Vona	80	Somewhat limited: Slope	0.16	Somewhat limited: Slope Cutbanks cave	0.16 0.10	Somewhat limited: Slope	0.16
90:							
Wages	80	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
91:							
Wages	80	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
92:							
Wages	80	Somewhat limited: Frost action Slope	0.50 0.04	Somewhat limited: Cutbanks cave Slope	0.10 0.04	Somewhat limited: Slope	0.04
93:							
Wages	45	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
Kimst	30	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	

Table 11b.--Building Site Development--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
94:							
Wages	45	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
Weld	35	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
95:							
Weld	80	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
96:							
Weld	45	Not limited		Somewhat limited: Cutbanks cave	0.10	Not limited	
Norka	40	Very limited: Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
97:							
Wiley	75	Somewhat limited: Frost action	0.50	Somewhat limited: Cutbanks cave	0.10	Not limited	
98:							
Water	100	Not rated		Not rated		Not rated	

Table 12a.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1:					
Ascalon	80	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.01
2:					
Ascalon	85	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.33
3:					
Ascalon	85	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
				Slope	1.00
4:					
Ascalon	85	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.01
5:					
Ascalon	80	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.01
6:					
Ascalon	85	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.33
7:					
Ascalon	85	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
		Slope	0.16	Slope	1.00
8:					
Ascalon	40	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.09
Eckley	30	Not limited		Very limited:	
				Seepage	1.00
				Slope	0.09
9:					
Ascalon	40	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.01

Table 12a.--Sanitary Facilities--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
9:					
Haxtun	35	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
		Restricted permeability	0.50	Slope	0.01
10:					
Bayard	80	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.33
11:					
Beckton	85	Not limited		Somewhat limited:	
				Slope	0.33
12:					
Bethune	85	Very limited:		Very limited:	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00		
13:					
Canyon	80	Very limited:		Very limited:	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.04	Slope	1.00
14:					
Canyon	40	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	
15:					
Colby	85	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.01
16:					
Colby	85	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
17:					
Colby	85	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
18:					
Colby	80	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50

Table 12a.--Sanitary Facilities--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
19:					
Colby	85	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.01
20:					
Colby	45	Very limited:		Very limited:	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Aridic Ustorthents	40	Very limited:		Very limited:	
		Slope	1.00	Slope	1.00
				Seepage	1.00
21:					
Concordia	80	Very limited:		Somewhat limited:	
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Flooding	0.40	Flooding	0.40
				Seepage	0.18
22:					
Eckley	40	Somewhat limited:		Very limited:	
		Slope	0.63	Seepage	1.00
				Slope	1.00
Wages	30	Not limited		Very limited:	
				Slope	1.00
				Seepage	1.00
23:					
Fort Collins	85	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.01
24:					
Glenberg	85	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
		Flooding	0.40	Flooding	0.40
				Slope	0.09
25:					
Glenberg	50	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
		Flooding	0.40	Flooding	0.40
				Slope	0.01
Bankard	30	Very limited:		Very limited:	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
26:					
Goshen	85	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40

Table 12a.--Sanitary Facilities--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
27:					
Haverson	80	Very limited:		Very limited:	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
28:					
Haxtun	85	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
		Restricted permeability	0.50	Slope	0.01
29:					
Iliff	80	Very limited:		Very limited:	
		Restricted permeability	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Seepage	0.32
30:					
Julesburg	80	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.01
31:					
Julesburg	85	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.33
32:					
Julesburg	80	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.01
33:					
Julesburg	85	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.33
34:					
Julesburg	45	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.67
Otero	35	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.67
35:					
Keith	80	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.01
36:					
Kimst	85	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.09

Table 12a.--Sanitary Facilities--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
37:					
Kimst	75	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
38:					
Kimst	45	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
Canyon	25	Very limited:		Very limited:	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Seepage	0.50
				Slope	0.33
39:					
Kimst	45	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.09
Richfield	30	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.68	Seepage	0.32
				Slope	0.01
40:					
Kimst	60	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
Wages	20	Not limited		Very limited:	
				Seepage	1.00
				Slope	0.33
41:					
Kitcarson	85	Very limited:		Very limited:	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Filtering capacity	1.00	Seepage	1.00
		Restricted permeability	0.50	Flooding	0.40
		Flooding	0.40		
42:					
Kuma	45	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.01
Keith	30	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.01
43:					
Kuma	45	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00

Table 12a.--Sanitary Facilities--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
43:					
Keith	30	Somewhat limited: Restricted permeability	0.50	Somewhat limited: Seepage	0.50
44:					
Manter	85	Very limited: Filtering capacity	1.00	Very limited: Seepage	1.00
				Slope	0.33
45:					
Manter	85	Very limited: Filtering capacity	1.00	Very limited: Seepage	1.00
				Slope	0.01
46:					
Manter	85	Very limited: Filtering capacity	1.00	Very limited: Seepage	1.00
				Slope	0.33
47:					
Manter	85	Very limited: Filtering capacity	1.00	Very limited: Seepage	1.00
				Slope	1.00
48:					
Manter	55	Very limited: Filtering capacity	1.00	Very limited: Seepage	1.00
		Slope	0.16	Slope	1.00
Ascalon	25	Somewhat limited: Restricted permeability	0.50	Very limited: Seepage	1.00
		Slope	0.16	Slope	1.00
49:					
Manter	50	Very limited: Filtering capacity	1.00	Very limited: Seepage	1.00
				Slope	0.33
Otero	35	Very limited: Filtering capacity	1.00	Very limited: Seepage	1.00
				Slope	0.33
50:					
Manzanst	85	Very limited: Restricted permeability	1.00	Somewhat limited: Flooding	0.40
		Flooding	0.40	Slope	0.01
51:					
Midway	45	Very limited: Depth to bedrock	1.00	Very limited: Depth to soft bedrock	1.00
		Slope	0.16	Slope	1.00

Table 12a.--Sanitary Facilities--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
51:					
Razor	35	Very limited:		Very limited:	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	0.04		
52:					
Norka	80	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.01
53:					
Norka	80	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.01
54:					
Norka	40	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.01
Colby	35	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.01
55:					
Norka	50	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
Colby	35	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
56:					
Norka	60	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
Colby	30	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
57:					
Norka	35	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
Colby	30	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
Weld	20	Very limited:		Somewhat limited:	
		Restricted permeability	1.00	Seepage	0.50
				Slope	0.33

Table 12a.--Sanitary Facilities--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
58:					
Nunn	80	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.82	Seepage	0.18
				Slope	0.01
59:					
Nunn	75	Not limited		Very limited:	
				Seepage	1.00
				Slope	0.09
60:					
Olnest	80	Not limited		Very limited:	
				Seepage	1.00
				Slope	0.33
61:					
Olnest	80	Not limited		Very limited:	
				Slope	1.00
				Seepage	1.00
62:					
Olnest	40	Not limited		Very limited:	
				Seepage	1.00
				Slope	0.33
Ascalon	35	Somewhat limited:		Very limited:	
		Restricted permeability	0.50	Seepage	1.00
				Slope	0.33
63:					
Otero	85	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
		Slope	0.37	Slope	1.00
64:					
Otero	40	Very limited:		Very limited:	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.67
Olnest	30	Not limited		Very limited:	
				Seepage	1.00
				Slope	0.67
65:					
Oxyaquic Ustifluvents	90	Very limited:		Very limited:	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Filtering capacity	1.00		
66:					
Paoli	80	Somewhat limited:		Very limited:	
		Flooding	0.40	Seepage	1.00
				Flooding	0.40

Table 12a.--Sanitary Facilities--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
67:					
Pits, gravel	100	Not rated		Not rated	
68:					
Platner	80	Somewhat limited:		Very limited:	
		Restricted permeability	0.68	Seepage	1.00
				Slope	0.01
69:					
Pleasant	85	Very limited:		Very limited:	
		Restricted permeability	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
70:					
Rago	90	Very limited:		Very limited:	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Seepage	1.00
71:					
Rago	55	Very limited:		Very limited:	
		Restricted permeability	1.00	Seepage	1.00
Weld	30	Very limited:		Somewhat limited:	
		Restricted permeability	1.00	Seepage	0.50
72:					
Richfield	85	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.68	Seepage	0.32
73:					
Richfield	85	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.68	Seepage	0.32
74:					
Richfield	80	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.68	Seepage	0.32
75:					
Sampson	85	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
76:					
Satanta	80	Somewhat limited:		Somewhat limited:	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.01

Table 12a.--Sanitary Facilities--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
77:					
Satanta	50	Somewhat limited: Restricted permeability	0.50	Somewhat limited: Seepage Slope	0.50 0.33
Colby	20	Somewhat limited: Restricted permeability	0.50	Somewhat limited: Seepage Slope	0.50 0.33
78:					
Satanta	40	Somewhat limited: Restricted permeability	0.50	Somewhat limited: Seepage Slope	0.50 0.01
Sampson	30	Somewhat limited: Restricted permeability Flooding	0.50 0.40	Somewhat limited: Seepage Flooding	0.50 0.40
79:					
Satanta	45	Somewhat limited: Restricted permeability	0.50	Somewhat limited: Seepage Slope	0.50 0.01
Ulmet	30	Somewhat limited: Restricted permeability	0.82	Somewhat limited: Seepage Slope	0.18 0.01
80:					
Stoneham	80	Somewhat limited: Restricted permeability	0.50	Somewhat limited: Seepage Slope	0.50 0.01
81:					
Stoneham	50	Somewhat limited: Restricted permeability	0.50	Somewhat limited: Seepage Slope	0.50 0.33
Fort Collins	30	Somewhat limited: Restricted permeability	0.50	Somewhat limited: Seepage Slope	0.50 0.33
82:					
Stoneham	40	Somewhat limited: Restricted permeability	0.50	Very limited: Slope Seepage	1.00 0.50
Kimst	20	Somewhat limited: Restricted permeability Slope	0.50 0.16	Very limited: Slope Seepage	1.00 0.50
Fort Collins	20	Somewhat limited: Restricted permeability	0.50	Very limited: Slope Seepage	1.00 0.50

Table 12a.--Sanitary Facilities--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
83:					
Ulmet	80	Somewhat limited: Restricted permeability	0.82	Somewhat limited: Seepage	0.18
				Slope	0.01
84:					
Ulysses	80	Somewhat limited: Restricted permeability	0.50	Somewhat limited: Seepage	0.50
				Slope	0.01
85:					
Valent	85	Very limited: Filtering capacity	1.00	Very limited: Seepage	1.00
				Slope	0.67
86:					
Valent	90	Very limited: Filtering capacity	1.00	Very limited: Slope	1.00
		Slope	1.00	Seepage	1.00
87:					
Valent	80	Very limited: Filtering capacity	1.00	Very limited: Seepage	1.00
				Slope	0.09
88:					
Valent	80	Very limited: Filtering capacity	1.00	Very limited: Seepage	1.00
		Slope	0.16	Slope	1.00
89:					
Vona	80	Somewhat limited: Slope	0.16	Very limited: Seepage	1.00
				Slope	1.00
90:					
Wages	80	Not limited		Very limited: Seepage	1.00
91:					
Wages	80	Not limited		Very limited: Seepage	1.00
				Slope	0.33
92:					
Wages	80	Somewhat limited: Slope	0.04	Very limited: Slope	1.00
				Seepage	1.00
93:					
Wages	45	Not limited		Very limited: Seepage	1.00
				Slope	0.09
Kinst	30	Somewhat limited: Restricted permeability	0.50	Somewhat limited: Seepage	0.50
				Slope	0.09

Table 12a.--Sanitary Facilities--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
94:					
Wages	45	Not limited		Very limited:	
				Seepage	1.00
				Slope	0.01
Weld	35	Very limited:		Somewhat limited:	
		Restricted		Seepage	0.50
		permeability	1.00	Slope	0.01
95:					
Weld	80	Very limited:		Somewhat limited:	
		Restricted		Seepage	0.50
		permeability	1.00		
96:					
Weld	45	Very limited:		Somewhat limited:	
		Restricted		Seepage	0.50
		permeability	1.00	Slope	0.01
Norka	40	Somewhat limited:		Somewhat limited:	
		Restricted		Seepage	0.50
		permeability	0.50	Slope	0.01
97:					
Wiley	75	Not limited		Very limited:	
				Seepage	1.00
				Slope	0.01
98:					
Water	100	Not rated		Not rated	

Table 12b.--Sanitary Facilities

(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
1:							
Ascalon	80	Not limited		Not limited		Not limited	
2:							
Ascalon	85	Not limited		Not limited		Not limited	
3:							
Ascalon	85	Not limited		Not limited		Not limited	
4:							
Ascalon	85	Not limited		Not limited		Somewhat limited:	
						Seepage	0.50
5:							
Ascalon	80	Not limited		Not limited		Somewhat limited:	
						Seepage	0.50
6:							
Ascalon	85	Not limited		Not limited		Somewhat limited:	
						Seepage	0.50
7:							
Ascalon	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Slope	0.16	Slope	0.16	Seepage	0.50
						Slope	0.16
8:							
Ascalon	40	Not limited		Not limited		Somewhat limited:	
						Seepage	0.50
Eckley	30	Not limited		Not limited		Somewhat limited:	
						Seepage	0.50
9:							
Ascalon	40	Not limited		Not limited		Not limited	
Haxtun	35	Very limited:		Very limited:		Somewhat limited:	
		Seepage	1.00	Seepage	1.00	Seepage	0.21
10:							
Bayard	80	Very limited:		Very limited:		Very limited:	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	1.00			Too sandy	0.50
11:							
Beckton	85	Not limited		Not limited		Not limited	
12:							
Bethune	85	Very limited:		Not limited		Very limited:	
		Depth to bedrock	1.00			Depth to bedrock	1.00

Table 12b.--Sanitary Facilities--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
13:							
Canyon	80	Very limited:		Somewhat limited:		Very limited:	
		Depth to bedrock	1.00	Slope	0.04	Depth to bedrock	1.00
		Slope	0.04			Slope	0.04
14:							
Canyon	40	Very limited:		Very limited:		Very limited:	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Rock outcrop	30	Not rated		Not rated		Not rated	
15:							
Colby	85	Not limited		Not limited		Not limited	
16:							
Colby	85	Not limited		Not limited		Not limited	
17:							
Colby	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Slope	0.16	Slope	0.16	Slope	0.16
18:							
Colby	80	Not limited		Not limited		Not limited	
19:							
Colby	85	Not limited		Not limited		Not limited	
20:							
Colby	45	Very limited:		Very limited:		Very limited:	
		Slope	1.00	Slope	1.00	Slope	1.00
Aridic Ustorthents	40	Very limited:		Very limited:		Very limited:	
		Slope	1.00	Slope	1.00	Slope	1.00
						Seepage	0.21
21:							
Concordia	80	Very limited:		Very limited:		Very limited:	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Sodium content	1.00	Flooding	0.40	Too clayey	1.00
		Too clayey	1.00				
		Flooding	0.40				
22:							
Eckley	40	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Slope	0.63	Slope	0.63	Slope	0.63
						Seepage	0.50
						Gravel content	0.07
Wages	30	Not limited		Not limited		Somewhat limited:	
						Seepage	0.21
23:							
Fort Collins	85	Not limited		Not limited		Not limited	
24:							
Glenberg	85	Somewhat limited:		Somewhat limited:		Very limited:	
		Flooding	0.40	Flooding	0.40	Seepage	1.00

Table 12b.--Sanitary Facilities--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
25:							
Glenberg	50	Very limited:		Somewhat limited:		Very limited:	
		Too sandy	1.00	Flooding	0.40	Seepage	1.00
		Flooding	0.40			Too sandy	0.50
Bankard	30	Very limited:		Very limited:		Very limited:	
		Flooding	1.00	Flooding	1.00	Too sandy	1.00
		Too sandy	1.00			Seepage	1.00
26:							
Goshen	85	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Too clayey	0.50	Flooding	0.40	Too clayey	0.50
		Flooding	0.40				
27:							
Haverson	80	Very limited:		Very limited:		Not limited	
		Flooding	1.00	Flooding	1.00		
28:							
Haxtun	85	Very limited:		Not limited		Not limited	
		Seepage	1.00				
29:							
Iliff	80	Very limited:		Not limited		Very limited:	
		Depth to bedrock	1.00			Depth to bedrock	1.00
30:							
Julesburg	80	Very limited:		Not limited		Very limited:	
		Too sandy	1.00			Seepage	1.00
						Too sandy	0.50
31:							
Julesburg	85	Very limited:		Not limited		Very limited:	
		Too sandy	1.00			Seepage	1.00
						Too sandy	0.50
32:							
Julesburg	80	Not limited		Not limited		Somewhat limited:	
						Seepage	0.50
33:							
Julesburg	85	Not limited		Not limited		Somewhat limited:	
						Seepage	0.50
34:							
Julesburg	45	Not limited		Not limited		Somewhat limited:	
						Seepage	0.50
Otero	35	Very limited:		Not limited		Very limited:	
		Too sandy	1.00			Seepage	1.00
35:							
Keith	80	Not limited		Not limited		Not limited	
36:							
Kimst	85	Not limited		Not limited		Not limited	
37:							
Kimst	75	Not limited		Not limited		Not limited	

Table 12b.--Sanitary Facilities--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
38:							
Kimst	45	Not limited		Not limited		Not limited	
Canyon	25	Very limited: Depth to bedrock	1.00	Not limited		Very limited: Depth to bedrock	1.00
39:							
Kimst	45	Not limited		Not limited		Not limited	
Richfield	30	Not limited		Not limited		Not limited	
40:							
Kimst	60	Not limited		Not limited		Not limited	
Wages	20	Not limited		Not limited		Somewhat limited: Seepage	0.21
41:							
Kitcarson	85	Very limited: Depth to saturated zone	1.00	Very limited: Depth to saturated zone	1.00	Very limited: Seepage	1.00
		Seepage	1.00	Seepage	1.00	Depth to saturated zone	0.47
		Flooding	0.40	Flooding	0.40		
42:							
Kuma	45	Very limited: Seepage	1.00	Very limited: Seepage	1.00	Somewhat limited: Seepage	0.21
Keith	30	Not limited		Not limited		Not limited	
43:							
Kuma	45	Very limited: Seepage	1.00	Very limited: Seepage	1.00	Somewhat limited: Seepage	0.21
Keith	30	Not limited		Not limited		Not limited	
44:							
Manter	85	Not limited		Not limited		Very limited: Seepage	1.00
45:							
Manter	85	Not limited		Not limited		Very limited: Seepage	1.00
46:							
Manter	85	Not limited		Not limited		Very limited: Seepage	1.00
47:							
Manter	85	Not limited		Not limited		Very limited: Seepage	1.00
48:							
Manter	55	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Very limited: Seepage	1.00
						Slope	0.16
Ascalon	25	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16

Table 12b.--Sanitary Facilities--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
49:							
Manter	50	Not limited		Not limited		Very limited: Seepage	1.00
Otero	35	Not limited		Not limited		Very limited: Seepage	1.00
50:							
Manzanst	85	Somewhat limited: Flooding	0.40	Somewhat limited: Flooding	0.40	Not limited	
51:							
Midway	45	Very limited: Depth to bedrock Slope	1.00 0.16	Somewhat limited: Slope	0.16	Very limited: Depth to bedrock Slope	1.00 0.16
Razor	35	Very limited: Depth to bedrock Slope	1.00 0.04	Somewhat limited: Slope	0.04	Very limited: Depth to bedrock Hard to compact Slope	1.00 1.00 0.04
52:							
Norka	80	Not limited		Not limited		Not limited	
53:							
Norka	80	Not limited		Not limited		Not limited	
54:							
Norka	40	Not limited		Not limited		Not limited	
Colby	35	Not limited		Not limited		Not limited	
55:							
Norka	50	Not limited		Not limited		Not limited	
Colby	35	Not limited		Not limited		Not limited	
56:							
Norka	60	Not limited		Not limited		Not limited	
Colby	30	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16
57:							
Norka	35	Not limited		Not limited		Not limited	
Colby	30	Not limited		Not limited		Not limited	
Weld	20	Not limited		Not limited		Not limited	
58:							
Nunn	80	Not limited		Not limited		Not limited	
59:							
Nunn	75	Not limited		Not limited		Somewhat limited: Seepage	0.16

Table 12b.--Sanitary Facilities--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
60:							
Olnest	80	Not limited		Not limited		Somewhat limited:	
						Seepage	0.21
61:							
Olnest	80	Not limited		Not limited		Somewhat limited:	
						Seepage	0.21
62:							
Olnest	40	Not limited		Not limited		Somewhat limited:	
						Seepage	0.21
Ascalon	35	Not limited		Not limited		Not limited	
63:							
Otero	85	Very limited:		Somewhat limited:		Very limited:	
		Too sandy	1.00	Slope	0.37	Seepage	1.00
		Slope	0.37			Slope	0.37
64:							
Otero	40	Not limited		Not limited		Very limited:	
						Seepage	1.00
Olnest	30	Not limited		Not limited		Somewhat limited:	
						Seepage	0.21
65:							
Oxyaquic Ustifluvents	90	Very limited:		Very limited:		Very limited:	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Seepage	1.00		
66:							
Paoli	80	Very limited:		Very limited:		Somewhat limited:	
		Seepage	1.00	Seepage	1.00	Seepage	0.50
		Flooding	0.40	Flooding	0.40		
67:							
Pits, gravel	100	Not rated		Not rated		Not rated	
68:							
Platner	80	Not limited		Not limited		Somewhat limited:	
						Seepage	0.21
69:							
Pleasant	85	Very limited:		Very limited:		Very limited:	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
70:							
Rago	90	Very limited:		Very limited:		Somewhat limited:	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Seepage	1.00				
		Too clayey	0.50				

Table 12b.--Sanitary Facilities--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
71:							
Rago	55	Very limited: Seepage	1.00	Not limited		Somewhat limited: Seepage	0.21
Weld	30	Not limited		Not limited		Not limited	
72:							
Richfield	85	Not limited		Not limited		Not limited	
73:							
Richfield	85	Not limited		Not limited		Not limited	
74:							
Richfield	80	Not limited		Not limited		Not limited	
75:							
Sampson	85	Somewhat limited: Flooding	0.40	Somewhat limited: Flooding	0.40	Not limited	
76:							
Satanta	80	Not limited		Not limited		Not limited	
77:							
Satanta	50	Not limited		Not limited		Not limited	
Colby	20	Not limited		Not limited		Not limited	
78:							
Satanta	40	Not limited		Not limited		Not limited	
Sampson	30	Somewhat limited: Flooding	0.40	Somewhat limited: Flooding	0.40	Not limited	
79:							
Satanta	45	Not limited		Not limited		Not limited	
Ulmet	30	Not limited		Not limited		Not limited	
80:							
Stoneham	80	Not limited		Not limited		Not limited	
81:							
Stoneham	50	Not limited		Not limited		Not limited	
Fort Collins	30	Not limited		Not limited		Not limited	
82:							
Stoneham	40	Not limited		Not limited		Not limited	
Kimst	20	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16	Somewhat limited: Slope	0.16
Fort Collins	20	Not limited		Not limited		Not limited	
83:							
Ulmet	80	Not limited		Not limited		Not limited	
84:							
Ulysses	80	Not limited		Not limited		Not limited	

Table 12b.--Sanitary Facilities--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
85:							
Valent	85	Very limited:		Not limited		Very limited:	
		Too sandy	1.00			Too sandy	1.00
						Seepage	1.00
86:							
Valent	90	Very limited:		Very limited:		Very limited:	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too sandy	1.00			Too sandy	1.00
						Seepage	1.00
87:							
Valent	80	Very limited:		Not limited		Very limited:	
		Too sandy	1.00			Seepage	1.00
						Too sandy	0.50
88:							
Valent	80	Very limited:		Somewhat limited:		Very limited:	
		Too sandy	1.00	Slope	0.16	Seepage	1.00
		Slope	0.16			Too sandy	0.50
						Slope	0.16
89:							
Vona	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Slope	0.16	Slope	0.16	Seepage	0.50
						Slope	0.16
90:							
Wages	80	Not limited		Not limited		Somewhat limited:	
						Seepage	0.21
91:							
Wages	80	Not limited		Not limited		Somewhat limited:	
						Seepage	0.21
92:							
Wages	80	Somewhat limited:		Somewhat limited:		Somewhat limited:	
		Slope	0.04	Slope	0.04	Seepage	0.21
						Slope	0.04
93:							
Wages	45	Not limited		Not limited		Somewhat limited:	
						Seepage	0.21
Kimst	30	Not limited		Not limited		Not limited	
94:							
Wages	45	Not limited		Not limited		Somewhat limited:	
						Seepage	0.21
Weld	35	Not limited		Not limited		Not limited	
95:							
Weld	80	Not limited		Not limited		Not limited	
96:							
Weld	45	Not limited		Not limited		Not limited	
Norka	40	Not limited		Not limited		Not limited	

Table 12b.--Sanitary Facilities--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
97:							
Wiley	75	Not limited		Not limited		Somewhat limited: Seepage	0.21
98:							
Water	100	Not rated		Not rated		Not rated	

Table 13a.--Construction Materials

(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 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
1:					
Ascalon	80	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
2:					
Ascalon	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
3:					
Ascalon	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
4:					
Ascalon	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
5:					
Ascalon	80	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
6:					
Ascalon	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
7:					
Ascalon	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
8:					
Ascalon	40	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.06
Eckley	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
9:					
Ascalon	40	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
Haxtun	35	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.04

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
10:					
Bayard	80	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.04
11:					
Beckton	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
12:					
Bethune	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
13:					
Canyon	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
14:					
Canyon	40	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	
15:					
Colby	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
16:					
Colby	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
17:					
Colby	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
18:					
Colby	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
19:					
Colby	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
20:					
Colby	45	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
20:					
Aridic Ustorthents--	40	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
21:					
Concordia----------	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
22:					
Eckley----------	40	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Wages----------	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
23:					
Fort Collins--------	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
24:					
Glenberg----------	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
25:					
Glenberg----------	50	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
Bankard----------	30	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.12
		Thickest layer	0.00	Bottom layer	0.22
26:					
Goshen----------	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
27:					
Haverson----------	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
28:					
Haxtun----------	85	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.04
29:					
Iliff----------	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
30:					
Julesburg	80	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.11
31:					
Julesburg	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.11
32:					
Julesburg	80	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.11
33:					
Julesburg	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.11
34:					
Julesburg	45	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.11
Otero	35	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
35:					
Keith	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
36:					
Kimst	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
37:					
Kimst	75	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
38:					
Kimst	45	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Canyon	25	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
39:					
Kimst	45	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
39:					
Richfield	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
40:					
Kimst	60	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Wages	20	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
41:					
Kitcarson	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10
42:					
Kuma	45	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Keith	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
43:					
Kuma	45	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Keith	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
44:					
Manter	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.09
45:					
Manter	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.09
46:					
Manter	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.09
47:					
Manter	85	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.09

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
48:					
Manter	55	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.09
Ascalon	25	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
49:					
Manter	50	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.06
		Thickest layer	0.00	Bottom layer	0.09
Otero	35	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
50:					
Manzanst	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
51:					
Midway	45	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Razor	35	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
52:					
Norka	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
53:					
Norka	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
54:					
Norka	40	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colby	35	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
55:					
Norka	50	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colby	35	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
56:					
Norka	60	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colby	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
57:					
Norka	35	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colby	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Weld	20	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
58:					
Nunn	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
59:					
Nunn	75	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.04
60:					
Olnest	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
61:					
Olnest	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
62:					
Olnest	40	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ascalon	35	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.06
63:					
Otero	85	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
64:					
Otero	40	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
64:					
Olnest	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
65:					
Oxyaquic Ustifluvents	90	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.90
66:					
Paoli	80	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
67:					
Pits, gravel	100	Not rated		Not rated	
68:					
Platner	80	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.04
69:					
Pleasant	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
70:					
Rago	90	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
71:					
Rago	55	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Weld	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
72:					
Richfield	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
73:					
Richfield	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
74:					
Richfield	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
75:					
Sampson	85	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
76:					
Satanta	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
77:					
Satanta	50	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colby	20	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
78:					
Satanta	40	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sampson	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
79:					
Satanta	45	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ulmet	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
80:					
Stoneham	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
81:					
Stoneham	50	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Fort Collins	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
82:					
Stoneham	40	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Kimst	20	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
82:					
Fort Collins	20	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
83:					
Ulmet	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
84:					
Ulysses	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
85:					
Valent	85	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.22
		Thickest layer	0.00	Thickest layer	0.90
86:					
Valent	90	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.22
		Thickest layer	0.00	Thickest layer	0.90
87:					
Valent	80	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.16
		Thickest layer	0.00	Bottom layer	0.22
88:					
Valent	80	Poor:		Fair:	
		Bottom layer	0.00	Thickest layer	0.16
		Thickest layer	0.00	Bottom layer	0.22
89:					
Vona	80	Poor:		Fair:	
		Bottom layer	0.00	Bottom layer	0.04
		Thickest layer	0.00	Thickest layer	0.04
90:					
Wages	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
91:					
Wages	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
92:					
Wages	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
93:					
Wages	45	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
93:					
Kimst	30	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
94:					
Wages	45	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Weld	35	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
95:					
Weld	80	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
96:					
Weld	45	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Norka	40	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
97:					
Wiley	75	Poor:		Poor:	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
98:					
Water	100	Not rated		Not rated	

Table 13b.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1:							
Ascalon	80	Fair: Low content of organic matter	0.88	Fair: Shrink-swell	0.95	Good	
2:							
Ascalon	85	Fair: Low content of organic matter	0.88	Fair: Shrink-swell	0.95	Good	
3:							
Ascalon	85	Fair: Low content of organic matter	0.88	Fair: Shrink-swell	0.95	Good	
4:							
Ascalon	85	Fair: Low content of organic matter	0.12	Good		Good	
5:							
Ascalon	80	Fair: Low content of organic matter	0.88	Fair: Shrink-swell	0.99	Good	
6:							
Ascalon	85	Fair: Low content of organic matter	0.88	Fair: Shrink-swell	0.99	Good	
7:							
Ascalon	85	Fair: Low content of organic matter	0.88	Fair: Shrink-swell	0.99	Fair: Slope	0.84
8:							
Ascalon	40	Fair: Low content of organic matter	0.88	Good		Good	
Eckley	30	Poor: Droughty	0.00	Good		Fair: Rock fragments	0.12
9:							
Ascalon	40	Fair: Low content of organic matter	0.88	Fair: Shrink-swell	0.95	Good	
Haxtun	35	Good		Good		Good	

Table 13b.--Construction Materials--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
10:							
Bayard	80	Fair:		Good		Good	
		Low content of organic matter	0.88				
11:							
Beckton	85	Poor:		Fair:		Good	
		Droughty	0.00	Shrink-swell	0.87		
		Too alkaline	0.00				
		Sodium content	0.00				
		Salinity	0.88				
		No water erosion limitation	0.99				
12:							
Bethune	85	Fair:		Poor:		Poor:	
		Carbonate content	0.08	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.16			Carbonate content	0.08
		Droughty	0.35			Depth to bedrock	0.16
		Low content of organic matter	0.88			Too clayey	0.63
		Too clayey	0.88				
13:							
Canyon	80	Poor:		Poor:		Poor:	
		Too sandy	0.00	Depth to bedrock	0.00	Too sandy	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
		Droughty	0.00			Slope	0.96
		Low content of organic matter	0.00				
14:							
Canyon	40	Poor:		Poor:		Poor:	
		Too sandy	0.00	Slope	0.00	Slope	0.00
		Depth to bedrock	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00			Too sandy	0.00
		Low content of organic matter	0.00				
Rock outcrop	30	Not rated		Not rated		Not rated	
15:							
Colby	85	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
16:							
Colby	85	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
17:							
Colby	85	Fair:		Good		Fair:	
		Low content of organic matter	0.88			Slope	0.84
		Water erosion	0.90				

Table 13b.--Construction Materials--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
18:							
Colby	80	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
19:							
Colby	85	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
20:							
Colby	45	Fair:		Fair:		Poor:	
		Low content of organic matter	0.88	Slope	0.92	Slope	0.00
		Water erosion	0.90				
Aridic Ustorthents	40	Fair:		Fair:		Poor:	
		Low content of organic matter	0.88	Slope	0.92	Slope	0.00
		No water erosion limitation	0.99			Rock fragments	0.28
21:							
Concordia	80	Poor:		Fair:		Fair:	
		Too alkaline	0.00	Shrink-swell	0.87	Sodium content	0.22
		Sodium content	0.00				
		Droughty	0.00				
		No water erosion limitation	0.99				
22:							
Eckley	40	Poor:		Good		Fair:	
		Droughty	0.00			Rock fragments	0.12
						Slope	0.37
Wages	30	Fair:		Good		Good	
		Low content of organic matter	0.88				
23:							
Fort Collins	85	Fair:		Good		Good	
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				
24:							
Glenberg	85	Fair:		Good		Good	
		Low content of organic matter	0.50				
25:							
Glenberg	50	Fair:		Good		Fair:	
		Low content of organic matter	0.50			Rock fragments	0.97

Table 13b.--Construction Materials--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
25:							
Bankard	30	Poor:		Good		Poor:	
		Wind erosion	0.00			Hard to reclaim	0.00
		Too sandy	0.22			Too sandy	0.22
		Droughty	0.35				
		Low content of organic matter	0.88				
26:							
Goshen	85	Fair:		Poor:		Good	
		Water erosion	0.90	Low strength	0.00		
				Shrink-swell	0.98		
27:							
Haverson	80	Fair:		Good		Fair:	
		Low content of organic matter	0.12			Rock fragments	0.97
		No water erosion limitation	0.99				
28:							
Haxtun	85	Poor:		Good		Good	
		Wind erosion	0.00				
29:							
Iliff	80	Poor:		Poor:		Poor:	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Depth to bedrock	0.93	Shrink-swell	0.65	Depth to bedrock	0.93
		No water erosion limitation	0.99				
30:							
Julesburg	80	Poor:		Good		Good	
		Wind erosion	0.00				
		Low content of organic matter	0.88				
31:							
Julesburg	85	Poor:		Good		Good	
		Wind erosion	0.00				
		Low content of organic matter	0.88				
32:							
Julesburg	80	Fair:		Good		Good	
		Low content of organic matter	0.88				
33:							
Julesburg	85	Fair:		Good		Good	
		Low content of organic matter	0.88				
34:							
Julesburg	45	Fair:		Good		Good	
		Low content of organic matter	0.88				

Table 13b.--Construction Materials--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
34:							
Otero	35	Fair:		Good		Good	
		Low content of organic matter	0.12				
		No water erosion limitation	0.99				
35:							
Keith	80	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
36:							
Kimst	85	Fair:		Good		Good	
		Low content of organic matter	0.12				
		No water erosion limitation	0.99				
37:							
Kimst	75	Fair:		Good		Good	
		Low content of organic matter	0.12				
		No water erosion limitation	0.99				
38:							
Kimst	45	Fair:		Good		Good	
		Low content of organic matter	0.12				
		No water erosion limitation	0.99				
Canyon	25	Poor:		Poor:		Poor:	
		Depth to bedrock	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Droughty	0.00			Depth to bedrock	0.00
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				
39:							
Kimst	45	Fair:		Good		Good	
		Low content of organic matter	0.12				
Richfield	30	Fair:		Poor:		Good	
		Low content of organic matter	0.88	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.82		
40:							
Kimst	60	Fair:		Good		Good	
		Low content of organic matter	0.12				

Table 13b.--Construction Materials--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
40:							
Wages	20	Fair: Low content of organic matter	0.88	Good		Good	
41:							
Kitcarson	85	Fair: Low content of organic matter	0.88	Fair: Depth to saturated zone	0.89	Fair: Depth to saturated zone	0.89
		No water erosion limitation	0.99				
42:							
Kuma	45	Fair: Low content of organic matter	0.88	Good		Good	
		No water erosion limitation	0.99				
Keith	30	Fair: Low content of organic matter	0.88	Good		Good	
		Water erosion	0.90				
43:							
Kuma	45	Fair: Low content of organic matter	0.88	Good		Good	
		No water erosion limitation	0.99				
Keith	30	Fair: Low content of organic matter	0.88	Good		Good	
		Water erosion	0.90				
44:							
Manter	85	Poor: Wind erosion	0.00	Good		Good	
		Low content of organic matter	0.12				
45:							
Manter	85	Fair: Low content of organic matter	0.12	Good		Good	
46:							
Manter	85	Fair: Low content of organic matter	0.12	Good		Good	
47:							
Manter	85	Fair: Low content of organic matter	0.12	Good		Good	

Table 13b.--Construction Materials--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
48:							
Manter	55	Fair:		Good		Fair:	
		Low content of organic matter	0.12			Slope	0.84
Ascalon	25	Fair:		Fair:		Fair:	
		Low content of organic matter	0.88	Shrink-swell	0.95	Slope	0.84
49:							
Manter	50	Fair:		Good		Good	
		Low content of organic matter	0.12				
Otero	35	Fair:		Good		Good	
		Low content of organic matter	0.12				
		No water erosion limitation	0.99				
50:							
Manzanst	85	Poor:		Poor:		Poor:	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.88	Shrink-swell	0.87	Sodium content	0.90
		Sodium content	0.90				
51:							
Midway	45	Poor:		Poor:		Poor:	
		Too clayey	0.00	Low strength	0.00	Depth to bedrock	0.00
		Droughty	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Depth to bedrock	0.00	Shrink-swell	0.12	Sodium content	0.60
		Low content of organic matter	0.12			Slope	0.84
		Sodium content	0.60			Salinity	0.88
		No water erosion limitation	0.99				
Razor	35	Poor:		Poor:		Poor:	
		Too clayey	0.00	Depth to bedrock	0.00	Salinity	0.00
		Sodium content	0.00	Low strength	0.00	Sodium content	0.00
		Low content of organic matter	0.12	Shrink-swell	0.51	Too clayey	0.00
		Salinity	0.50			Depth to bedrock	0.58
		Droughty	0.52			Slope	0.96
		Depth to bedrock	0.58				
52:							
Norka	80	Fair:		Fair:		Good	
		Low content of organic matter	0.88	Shrink-swell	0.99		
		Water erosion	0.90				
53:							
Norka	80	Fair:		Fair:		Good	
		Low content of organic matter	0.88	Shrink-swell	0.99		
		Water erosion	0.90				

Table 13b.--Construction Materials--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
54:							
Norka	40	Fair:		Fair:		Good	
		Low content of organic matter	0.88	Shrink-swell	0.99		
		Water erosion	0.90				
Colby	35	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
55:							
Norka	50	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
Colby	35	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
56:							
Norka	60	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
Colby	30	Fair:		Good		Fair:	
		Low content of organic matter	0.88			Slope	0.84
		Water erosion	0.90				
57:							
Norka	35	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
Colby	30	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
Weld	20	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
58:							
Nunn	80	Fair:		Fair:		Fair:	
		Low content of organic matter	0.50	Low strength	0.78	Too clayey	0.54
		Too clayey	0.82	Shrink-swell	0.79		
59:							
Nunn	75	Fair:		Good		Good	
		Low content of organic matter	0.12				

Table 13b.--Construction Materials--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
60:							
Olnest	80	Fair: Low content of organic matter	0.88	Good		Good	
61:							
Olnest	80	Fair: Low content of organic matter	0.88	Good		Good	
62:							
Olnest	40	Fair: Low content of organic matter	0.88	Good		Good	
Ascalon	35	Fair: Low content of organic matter	0.88	Fair: Shrink-swell	0.95	Good	
63:							
Otero	85	Fair: Low content of organic matter; No water erosion limitation	0.12; 0.99	Good		Fair: Slope	0.63
64:							
Otero	40	Fair: Low content of organic matter; No water erosion limitation	0.12; 0.99	Good		Good	
Olnest	30	Fair: Low content of organic matter	0.88	Good		Good	
65:							
Oxyaquic Ustifluvents	90	Fair: Low content of organic matter; No water erosion limitation	0.88; 0.99	Poor: Depth to saturated zone	0.00	Poor: Depth to saturated zone	0.00
66:							
Paoli	80	Good		Good		Good	
67:							
Pits, gravel	100	Not rated		Not rated		Not rated	
68:							
Platner	80	Fair: Low content of organic matter	0.50	Good		Good	

Table 13b.--Construction Materials--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
69:							
Pleasant	85	Poor:		Poor:		Poor:	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
				Depth to saturated zone	0.00	Depth to saturated zone	0.00
				Shrink-swell	0.12		
70:							
Rago	90	Fair:		Poor:		Fair:	
		Too clayey	0.08	Low strength	0.00	Too clayey	0.07
				Shrink-swell	0.99		
71:							
Rago	55	Fair:		Fair:		Fair:	
		Too clayey	0.08	Shrink-swell	0.95	Too clayey	0.07
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				
Weld	30	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
72:							
Richfield	85	Fair:		Poor:		Good	
		Low content of organic matter	0.88	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.82		
73:							
Richfield	85	Fair:		Poor:		Good	
		Low content of organic matter	0.88	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.82		
74:							
Richfield	80	Fair:		Poor:		Good	
		Low content of organic matter	0.88	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.82		
75:							
Sampson	85	Good		Fair:		Good	
				Shrink-swell	0.99		
76:							
Satanta	80	Fair:		Good		Good	
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				

Table 13b.--Construction Materials--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
77:							
Satanta	50	Fair:		Good		Good	
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				
Colby	20	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
78:							
Satanta	40	Fair:		Good		Good	
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				
Sampson	30	Good		Fair:		Good	
				Shrink-swell	0.99		
79:							
Satanta	45	Fair:		Good		Good	
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				
Ulmet	30	Fair:		Fair:		Good	
		Low content of organic matter	0.88	Shrink-swell	0.79		
80:							
Stoneham	80	Fair:		Fair:		Good	
		Low content of organic matter	0.88	Shrink-swell	0.87		
		No water erosion limitation	0.99				
81:							
Stoneham	50	Fair:		Fair:		Good	
		Low content of organic matter	0.88	Shrink-swell	0.87		
		No water erosion limitation	0.99				
Fort Collins	30	Fair:		Good		Good	
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				
82:							
Stoneham	40	Fair:		Fair:		Good	
		Low content of organic matter	0.88	Shrink-swell	0.87		
		No water erosion limitation	0.99				

Table 13b.--Construction Materials--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
82:							
Kimst	20	Fair:		Good		Fair:	
		Low content of organic matter	0.12			Slope	0.84
		No water erosion limitation	0.99				
Fort Collins	20	Fair:		Good		Good	
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				
83:							
Ulmet	80	Fair:		Fair:		Good	
		Low content of organic matter	0.88	Shrink-swell	0.79		
84:							
Ulysses	80	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
85:							
Valent	85	Poor:		Good		Fair:	
		Wind erosion	0.00			Too sandy	0.22
		Too sandy	0.22				
		Droughty	0.35				
		Low content of organic matter	0.50				
86:							
Valent	90	Poor:		Poor:		Poor:	
		Wind erosion	0.00	Slope	0.00	Slope	0.00
		Too sandy	0.22			Too sandy	0.22
		Droughty	0.35				
		Low content of organic matter	0.50				
87:							
Valent	80	Poor:		Good		Fair:	
		Wind erosion	0.00			Too sandy	0.22
		Too sandy	0.22				
		Droughty	0.35				
		Low content of organic matter	0.50				
88:							
Valent	80	Poor:		Good		Fair:	
		Wind erosion	0.00			Too sandy	0.22
		Too sandy	0.22			Slope	0.84
		Droughty	0.35				
		Low content of organic matter	0.50				

Table 13b.--Construction Materials--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
89:							
Vona	80	Fair:		Good		Fair:	
		Low content of organic matter	0.12			Slope	0.84
90:							
Wages	80	Fair:		Good		Good	
		Low content of organic matter	0.88				
91:							
Wages	80	Fair:		Good		Good	
		Low content of organic matter	0.88				
92:							
Wages	80	Fair:		Good		Fair:	
		Low content of organic matter	0.88			Slope	0.96
93:							
Wages	45	Fair:		Good		Good	
		Low content of organic matter	0.88				
Kimst	30	Fair:		Good		Good	
		Low content of organic matter	0.12				
		No water erosion limitation	0.99				
94:							
Wages	45	Fair:		Good		Good	
		Low content of organic matter	0.88				
Weld	35	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
95:							
Weld	80	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
96:							
Weld	45	Fair:		Good		Good	
		Low content of organic matter	0.88				
		Water erosion	0.90				
Norka	40	Fair:		Fair:		Good	
		Low content of organic matter	0.88	Shrink-swell	0.99		
		Water erosion	0.90				

Table 13b.--Construction Materials--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
97:							
Wiley	75	Fair:		Good		Good	
		Low content of organic matter	0.12				
		Water erosion	0.68				
98:							
Water	100	Not rated		Not rated		Not rated	

Table 14.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1:							
Ascalon	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Limitation: too arid
2:							
Ascalon	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Limitation: too arid
3:							
Ascalon	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
4:							
Ascalon	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: droughty	Limitation: soil blowing	Limitation: too arid droughty
5:							
Ascalon	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Favorable	Limitation: too arid
6:							
Ascalon	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Limitation: too arid
7:							
Ascalon	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope too arid
8:							
Ascalon	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Limitation: too arid
Eckley	Severe: seepage	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: too sandy	Limitation: too arid droughty
9:							
Ascalon	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Limitation: too arid
Haxtun	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable.
10:							
Bayard	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
11:							
Beckton	Moderate: slope	Severe: excess sodium piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily	Limitation: excess sodium excess salt too arid

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
12:							
Bethune	Moderate: depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly depth to rock	Limitation: depth to rock	Limitation: percs slowly too arid depth to rock
13:							
Canyon	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope too arid
14:							
Canyon	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope too arid
Rock outcrop	Severe: slope depth to rock	Slight	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
15:							
Colby	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
16:							
Colby	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
17:							
Colby	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
18:							
Colby	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
19:							
Colby	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
20:							
Colby	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Aridic Ustorthents	Severe: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope droughty	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
21:							
Concordia	Moderate: seepage	Severe: excess sodium excess salt	Severe: slow refill salty water	Limitation: deep to water	Limitation: percs slowly droughty	Limitation: erodes easily percs slowly	Limitation: excess sodium excess salt too arid

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
22:							
Eckley	Severe: seepage slope	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: slope too sandy soil blowing	Limitation: slope too arid droughty
Wages	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Limitation: too arid
23:							
Fort Collins	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
24:							
Glenberg	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing droughty	Limitation: too sandy soil blowing	Limitation: too arid droughty
25:							
Glenberg	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing droughty	Limitation: too sandy soil blowing	Limitation: too arid droughty
Bankard	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: rooting depth too arid droughty
26:							
Goshen	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
27:							
Haverson	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: excess salt	Limitation: erodes easily too sandy	Limitation: erodes easily excess salt too arid
28:							
Haxtun	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water ponding	Limitation: fast intake soil blowing ponding	Limitation: soil blowing ponding	Limitation: wetness
29:							
Iliff	Moderate: depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
30:							
Julesburg	Severe: seepage	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: soil blowing droughty	Limitation: soil blowing	Limitation: too arid droughty
31:							
Julesburg	Severe: seepage	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: soil blowing	Limitation: too arid droughty
32:							
Julesburg	Severe: seepage	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Limitation: too arid

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
33:							
Julesburg	Severe: seepage	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
34:							
Julesburg	Severe: seepage	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
Otero	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: erodes easily soil blowing	Limitation: erodes easily too arid
35:							
Keith	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
36:							
Kimst	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily too arid
37:							
Kimst	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily too arid
38:							
Kimst	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily too arid
Canyon	Severe: depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid
39:							
Kimst	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Limitation: too arid
Richfield	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
40:							
Kimst	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Limitation: too arid
Wages	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Limitation: too arid
41:							
Kitcarson	Severe: seepage	Severe: seepage piping	Severe: cutbanks cave	Limitation: cutbanks cave	Limitation: erodes easily wetness	Limitation: erodes easily too sandy wetness	Limitation: erodes easily

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
42:							
Kuma	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily
Keith	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily too arid
43:							
Kuma	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Keith	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
44:							
Manter	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: soil blowing	Limitation: too arid droughty
45:							
Manter	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Limitation: too arid
46:							
Manter	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
47:							
Manter	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
48:							
Manter	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
Ascalon	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Limitation: too arid
49:							
Manter	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
Otero	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: erodes easily soil blowing	Limitation: erodes easily too arid
50:							
Manzanst	Slight	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Limitation: percs slowly	Limitation: percs slowly too arid
51:							
Midway	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
51:							
Razor	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: percs slowly slope depth to rock	Limitation: slope too arid depth to rock
52:							
Norka	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
53:							
Norka	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
54:							
Norka	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
Colby	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
55:							
Norka	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Colby	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
56:							
Norka	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Colby	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
57:							
Norka	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Colby	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Weld	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
58:							
Nunn	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Favorable	Limitation: percs slowly too arid

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
59:							
Nunn	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Favorable	Limitation: percs slowly too arid
60:							
Olnest	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
61:							
Olnest	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
62:							
Olnest	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Limitation: too arid
Ascalon	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Limitation: too arid
63:							
Otero	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: erodes easily slope soil blowing	Limitation: erodes easily slope too arid
64:							
Otero	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: erodes easily soil blowing	Limitation: erodes easily too arid
Olnest	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
65:							
Oxyaquic Ustifluvents	Severe: seepage	Severe: seepage piping wetness	Severe: slow refill cutbanks cave	Limitation: flooding frost action percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily too sandy wetness	Limitation: erodes easily percs slowly wetness
66:							
Paoli	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable.
67:							
Pits, gravel	Severe: seepage	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: fast intake droughty	Limitation: large stones too sandy	Limitation: large stones droughty
68:							
Platner	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Favorable	Limitation: percs slowly too arid
69:							
Pleasant	Moderate: seepage	Severe: hard to pack ponding	Severe: no water	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness too arid

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
70:							
Rago	Severe: seepage	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: flooding percs slowly	Limitation: percs slowly	Limitation: percs slowly
71:							
Rago	Severe: seepage	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Weld	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
72:							
Richfield	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
73:							
Richfield	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
74:							
Richfield	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
75:							
Sampson	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water percs slowly	Limitation: percs slowly	Limitation: percs slowly	Limitation: percs slowly
76:							
Satanta	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
77:							
Satanta	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Colby	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
78:							
Satanta	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
Sampson	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Favorable	Favorable.
79:							
Satanta	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
Ulmet	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Limitation: percs slowly	Limitation: percs slowly too arid

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
80:							
Stoneham	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
81:							
Stoneham	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Fort Collins	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
82:							
Stoneham	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Kimst	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Fort Collins	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
83:							
Ulmet	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Limitation: percs slowly	Limitation: percs slowly too arid
84:							
Ulysses	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily too arid
85:							
Valent	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: too arid droughty
86:							
Valent	Severe: seepage slope	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: slope too arid droughty
87:							
Valent	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: too arid droughty
88:							
Valent	Severe: seepage slope	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: slope too arid droughty

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
89:							
Vona	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
90:							
Wages	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Favorable	Limitation: too arid
91:							
Wages	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Limitation: too arid
92:							
Wages	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope too arid
93:							
Wages	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Favorable	Limitation: too arid
Kimst	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily too arid
94:							
Wages	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Favorable	Limitation: too arid
Weld	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
95:							
Weld	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
96:							
Weld	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
Norka	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
97:							
Wiley	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily too arid
98:							
Water.							

Table 15.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated)

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	
1:												
Ascalon--------	0-6	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-10	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	10-21	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	21-37	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	37-50	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	50-60	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5
2:												
Ascalon--------	0-6	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-10	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	10-21	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	21-37	Sandy clay loam	CL-ML, SC, SC-SM, CL	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	37-50	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	50-60	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5
3:												
Ascalon--------	0-6	Sandy loam-----	SC, SC-SM	A-4, A-2-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-10	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	10-21	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	21-37	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	37-50	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	50-60	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5
4:												
Ascalon--------	0-4	Fine sandy loam	SM	A-2, A-4	0	0	95-100	90-100	70-95	25-50	15-25	NP-5
	4-7	Fine sandy loam	SM	A-2, A-4	0	0	95-100	90-100	70-95	25-50	15-25	NP-5
	7-14	Sandy clay loam	CL, SC	A-6	0	0	95-100	90-100	80-100	40-55	25-40	10-20
	14-18	Sandy clay loam	CL, SC	A-6	0	0	95-100	90-100	80-100	40-55	25-40	10-20
	18-25	Loam-----------	CL, CL-ML, SC, SM	A-4, A-6	0	0	95-100	95-100	75-95	40-65	20-40	NP-15
	25-60	Fine sandy loam	SM	A-2	0	0	95-100	95-100	70-95	20-35	---	NP

Table 15.--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	
5:												
Ascalon--------	0-4	Loam----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	4-7	Loam----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	7-12	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	12-22	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	22-41	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	41-60	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5
6:												
Ascalon--------	0-4	Loam----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	4-7	Loam----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	7-12	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	12-22	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	22-41	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	41-60	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5
7:												
Ascalon--------	0-4	Loam----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	4-7	Loam----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	7-12	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	12-22	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	22-41	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	41-60	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5
8:												
Ascalon--------	0-3	Loam----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	3-10	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	10-15	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	15-24	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	24-31	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5
	31-60	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5

Table 15.--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	
8:												
Eckley---------	0-4	Loam----------	CL, CL-ML	A-4	0	0	95-100	95-100	85-95	60-75	25-30	5-10
	4-12	Gravelly sandy clay loam.	CL, GC, GC-GM, SC	A-2, A-4, A-6	0	0	60-100	55-95	45-90	20-55	25-35	5-15
	12-15	Gravelly sandy loam.	GC, GC-GM, SC, SC-SM	A-1-b, A-2-4	0	0	60-80	55-75	35-50	20-30	25-30	5-10
	15-22	Gravelly sand--	GM, GP-GM, SM, SP-SM	A-1-a, A-1-b, A-2-4	0	0	35-80	30-75	20-55	0-20	---	NP
	22-60	Gravelly sand--	GM, GP-GM, SM, SP-SM	A-1-a, A-1-b, A-2-4	0	0	35-80	30-75	20-55	0-20	---	NP
9:												
Ascalon--------	0-6	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-10	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	10-21	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	21-37	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	37-50	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	50-60	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5
Haxtun---------	0-9	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-70	30-40	20-25	NP-5
	9-24	Sandy loam-----	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	24-30	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-100	35-80	25-35	5-15
	30-40	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-100	35-80	25-35	5-15
	40-48	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-100	35-80	25-35	5-15
	48-58	Sandy loam-----	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	100	50-95	15-75	20-30	NP-10
	58-72	Loamy sand-----	SC-SM, SM, CL-ML, ML	A-2-4, A-4	0	0	100	100	50-95	15-75	20-30	NP-10
10:												
Bayard---------	0-5	Fine sandy loam	CL, CL-ML, SC, SC-SM	A-4	0	0	95-100	85-100	60-85	35-55	25-30	5-10
	5-15	Fine sandy loam	CL, CL-ML, SC, SC-SM	A-4	0	0	95-100	85-100	60-85	35-55	25-30	5-10
	15-21	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	85-100	55-85	30-55	20-25	NP-5
	21-36	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	85-100	55-85	30-55	20-25	NP-5
	36-60	Loamy fine sand	SC-SM, SM	A-2-4, A-4	0	0	90-100	80-100	50-80	25-50	20-25	NP-5

Table 15.--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	
11:												
Beckton--------	0-2	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	2-4	Silty clay loam	ML	A-7, A-4	0	0	100	100	95-100	85-95	30-50	5-15
	4-8	Silty clay-----	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	8-17	Silty clay loam	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	17-24	Silty clay loam	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	24-60	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
12:												
Bethune--------	0-4	Silty clay loam	ML	A-7	0	0	100	100	95-100	85-95	40-45	10-15
	4-11	Silty clay-----	ML	A-7	0	0	100	100	95-100	90-95	45-50	15-20
	11-17	Silty clay-----	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	17-25	Gravelly clay loam.	CL, GC, SC	A-6	0	0	60-80	55-75	50-75	40-60	30-35	10-15
	25-29	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
13:												
Canyon---------	0-3	Gravelly loam--	CL, CL-ML, GC, GC-GM	A-4	0-10	0-15	60-80	55-75	50-70	35-55	25-30	5-10
	3-7	Loam-----------	CL, CL-ML, GC-GM, SC	A-4	0-10	0-15	60-95	55-85	50-80	35-70	25-30	5-10
	7-10	Loam-----------	CL, CL-ML, GC-GM, SC	A-4	0-10	0-15	60-95	55-85	50-80	35-70	25-30	5-10
	10-14	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
14:												
Canyon---------	0-3	Gravelly loam--	CL, CL-ML, GC, GC-GM	A-4	0-10	0-15	60-80	55-75	50-70	35-55	25-30	5-10
	3-7	Loam-----------	CL, CL-ML, GC-GM, SC	A-4	0-10	0-15	60-95	55-85	50-80	35-70	25-30	5-10
	7-10	Loam-----------	CL, CL-ML, GC-GM, SC	A-4	0-10	0-15	60-95	55-85	50-80	35-70	25-30	5-10
	10-14	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop---	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	0-14	---
15:												
Colby----------	0-4	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	4-60	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10

Table 15.--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	
16:												
Colby	0-6	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	6-12	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	12-30	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	30-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
17:												
Colby	0-3	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	3-8	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	8-30	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	30-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
18:												
Colby	0-5	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-16	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	16-32	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	32-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
19:												
Colby	0-5	Silty clay loam	CL, ML	A-6	0	0	100	100	95-100	85-95	35-40	10-15
	5-19	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	19-42	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	42-62	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
20:												
Colby	0-4	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	4-33	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	33-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
Aridic Ustorthents	0-4	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	4-8	Loam	CL, GC, GC-GM, SC-SM	A-1-b, A-2-4, A-4	0	0	60-100	55-100	35-80	20-60	25-30	5-10
	8-17	Loam	CL, GC, GC-GM, SC-SM	A-1-b, A-2-4, A-4	0	0	60-100	55-100	35-80	20-60	25-30	5-10
	17-35	Loam	CL, GC, GC-GM, SC-SM	A-1-b, A-2-4, A-4	0	0	60-100	55-100	35-80	20-60	25-30	5-10
	35-63	Loam	CL, GC, GC-GM, SC-SM	A-1-b, A-2-4, A-4	0	0	60-100	55-100	35-80	20-60	25-30	5-10

Table 15.--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	
21:												
Concordia------	0-2	Loam----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	2-6	Clay----------	CL	A-6, A-7	0	0	100	100	90-100	70-95	50-65	30-40
	6-13	Clay----------	CL	A-6, A-7	0	0	100	100	90-100	70-95	50-65	30-40
	13-24	Clay----------	CL	A-6, A-7	0	0	100	100	90-100	70-95	50-65	30-40
	24-38	Clay----------	CL	A-6, A-7	0	0	100	100	90-100	70-95	50-65	30-40
	38-47	Clay loam------	CL, CL-ML	A-4, A-6	0	0	90-100	90-100	85-100	60-85	25-40	5-20
	47-56	Silty clay-----	CL, CL-ML	A-4, A-6	0	0	90-100	90-100	85-100	60-85	25-40	5-20
	56-80	Silty clay-----	CL, CL-ML	A-4, A-6	0	0	90-100	90-100	85-100	60-85	25-40	5-20
22:												
Eckley---------	0-4	Gravelly sandy loam.	GC, GC-GM, SC, SC-SM	A-1-b, A-2-4	0	0	60-80	55-75	35-50	20-30	25-30	5-10
	4-12	Gravelly sandy clay loam.	CL, GC, GC-GM, SC	A-2, A-4, A-6	0	0	60-100	55-95	45-90	20-55	25-35	5-15
	12-15	Gravelly sandy loam.	GC, GC-GM, SC, SC-SM	A-1-b, A-2-4	0	0	60-80	55-75	35-50	20-30	25-30	5-10
	15-22	Gravelly sand--	GM, GP-GM, SM, SP-SM	A-1-a, A-1-b, A-2-4	0	0	35-80	30-75	20-55	0-20	---	NP
	22-60	Gravelly sand--	GM, GP-GM, SM, SP-SM	A-1-a, A-1-b, A-2-4	0	0	35-80	30-75	20-55	0-20	---	NP
Wages----------	0-5	Loam----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	5-12	Loam----------	CL, SC	A-6	0	0	100	100	80-100	35-80	30-35	10-15
	12-17	Loam----------	SC-SM, CL, CL-ML, SC	A-4	0	0	100	100	80-100	35-80	25-30	5-10
	17-60	Loam----------	CL, SC, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-95	30-75	20-30	NP-10
23:												
Fort Collins---	0-5	Loam----------	CL, CL-ML	A-4	0	0	95-100	90-100	80-90	60-70	25-30	5-10
	5-9	Loam----------	CL, CL-ML	A-4	0	0	95-100	90-100	80-90	60-70	25-30	5-10
	9-19	Clay loam------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-75	25-35	5-15
	19-26	Clay loam------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-75	25-35	5-15
	26-60	Loam----------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-75	25-35	5-15
24:												
Glenberg-------	0-5	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	95-100	85-100	60-70	30-40	25-30	5-10
	5-9	Sandy loam-----	SM, CL-ML, ML, SC-SM	A-2-4, A-4	0	0	95-100	95-100	60-85	30-55	20-25	NP-5
	9-17	Sandy loam-----	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	95-100	95-100	60-85	30-55	20-25	NP-5
	17-28	Sandy loam-----	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	95-100	95-100	60-85	30-55	20-25	NP-5
	28-32	Sandy loam-----	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	95-100	95-100	60-85	30-55	20-25	NP-5
	32-60	Sandy loam-----	CL-ML, ML, SC-SM, SM	A-1-b, A-2-4, A-4	0	0	90-100	75-100	45-85	15-55	20-25	NP-5

Table 15.--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	
25:												
Glenberg-------	0-4	Fine sandy loam	CL, CL-ML, SC, SC-SM	A-4	0	0	95-100	85-100	70-85	40-55	25-30	5-10
	4-13	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	95-100	95-100	60-85	30-55	20-25	NP-5
	13-21	Sandy loam-----	CL-ML, ML, SC-SM, SM	A-1-b, A-2-4, A-4	0	0	90-100	75-100	45-85	15-55	20-25	NP-5
	21-60	Loamy sand-----	CL-ML, ML, SC-SM, SM	A-1-b, A-2-4, A-4	0	0	90-100	75-100	45-85	15-55	20-25	NP-5
Bankard--------	0-4	Loamy sand-----	SC-SM, SM	A-2-4	0	0	95-100	90-100	50-75	15-30	20-25	NP-5
	4-60	Sand-----------	SM, SP-SM, SW-SM	A-1-b, A-2-4, A-3	0	0	90-100	80-100	45-70	5-25	20-25	NP-5
26:												
Goshen---------	0-4	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	4-19	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	19-32	Silty clay loam	ML	A-4, A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	5-20
	32-45	Silty clay loam	ML	A-4, A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	5-20
	45-52	Silty clay loam	ML	A-4, A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	5-20
	52-60	Silt loam------	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
27:												
Haverson-------	0-5	Loam-----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	5-14	Loam-----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	14-60	Stratified sand to clay loam.	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	75-100	65-90	45-60	25-35	5-15
28:												
Haxtun---------	0-6	Loamy sand-----	SC-SM, SM	A-2-4	0	0	100	100	50-75	15-30	20-25	NP-5
	6-13	Sandy loam-----	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	13-18	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	18-26	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	26-39	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	39-43	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	43-52	Loamy sand-----	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	100	50-95	15-75	20-30	NP-10
	52-61	Loamy sand-----	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	100	50-95	15-75	20-30	NP-10

Table 15.--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	
29:												
Iliff----------	0-6	Silt loam------	CL, CL-ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	6-9	Silt loam------	CL, CL-ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	9-15	Silty clay-----	MH, ML	A-7	0	0	100	100	95-100	85-95	40-60	15-25
	15-20	Silty clay loam	MH, ML	A-7	0	0	100	100	95-100	85-95	30-50	5-20
	20-25	Silty clay loam	MH, ML	A-7	0	0	100	100	95-100	85-95	30-50	5-20
	25-31	Clay loam------	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	75-100	60-80	25-35	5-15
	31-36	Clay loam------	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	75-100	60-80	25-35	5-15
	36-40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
30:												
Julesburg------	0-8	Loamy sand-----	SC-SM, SM	A-2-4	0	0	100	100	50-75	15-30	20-25	NP-5
	8-14	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	14-34	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	34-42	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	42-62	Loamy sand-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-75	15-40	20-25	NP-5
31:												
Julesburg------	0-8	Loamy sand-----	SC-SM, SM	A-2-4	0	0	100	100	50-75	15-30	20-25	NP-5
	8-14	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	14-34	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	34-42	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	42-62	Loamy sand-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-75	15-40	20-25	NP-5
32:												
Julesburg------	0-5	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-70	30-40	20-25	NP-5
	5-12	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	12-30	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	30-42	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	42-60	Loamy sand-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-75	15-40	20-25	NP-5
33:												
Julesburg------	0-5	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-70	30-40	20-25	NP-5
	5-12	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	12-30	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	30-42	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	42-60	Loamy sand-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-75	15-40	20-25	NP-5
34:												
Julesburg------	0-5	Sandy loam-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-70	30-40	20-25	NP-5
	5-12	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	12-30	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	30-42	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	42-60	Loamy sand-----	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-75	15-40	20-25	NP-5

Table 15.--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	
34:												
Otero----------	0-6	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-25	NP-5
	6-60	Loamy very fine sand.	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-95	40-60	20-25	NP-5
35:												
Keith----------	0-6	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	6-14	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-20
	14-20	Silt loam------	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-20
	20-37	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	37-60	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
36:												
Kimst----------	0-6	Loam-----------	CL, CL-ML	A-4	0	0	95-100	85-100	75-90	60-75	25-30	5-10
	6-12	Loam-----------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
	12-60	Loam-----------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
37:												
Kimst----------	0-5	Loam-----------	CL, CL-ML	A-4	0	0	95-100	95-100	85-95	60-75	25-30	5-10
	5-22	Sandy clay loam	CL, CL-ML	A-4, A-6	0	0	90-100	90-100	85-100	60-80	25-35	5-15
	22-60	Sandy clay loam	CL, CL-ML	A-4, A-6	0	0	90-100	90-100	85-100	60-80	25-35	5-15
38:												
Kimst----------	0-4	Loam-----------	CL, CL-ML	A-4	0	0	95-100	85-100	75-90	60-75	25-30	5-10
	4-7	Loam-----------	CL, CL-ML	A-4	0	0	95-100	85-100	75-90	60-75	25-30	5-10
	7-30	Loam-----------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
	30-60	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
Canyon---------	0-3	Loam-----------	CL, CL-ML	A-4	0-5	0-5	90-95	75-95	70-95	50-75	25-30	5-10
	3-7	Gravelly loam--	CL, CL-ML, GC-GM, SC	A-4	0-10	0-15	60-80	55-75	50-70	35-55	25-30	5-10
	7-13	Gravelly loam--	CL, CL-ML, GC-GM, SC	A-4	0-10	0-15	60-80	55-75	50-70	35-55	25-30	5-10
	13-17	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---

Table 15.--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	
39:												
Kimst	0-4	Clay loam	CL	A-6	0	0	95-100	85-100	80-95	65-80	30-35	10-15
	4-12	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
	12-20	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
	20-41	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
	41-60	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
Richfield	0-5	Silty clay loam	ML	A-6, A-7-6	0	0	100	100	95-100	85-95	35-45	10-20
	5-15	Silty clay	CH, CL, MH, ML	A-7	0	0	100	100	95-100	85-95	40-55	15-25
	15-24	Silty clay loam	ML	A-4, A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	5-20
	24-27	Silty clay loam	ML	A-4, A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	5-20
	27-49	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-40	5-20
	49-60	Clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-40	5-20
40:												
Kimst	0-5	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4	0	0	95-100	85-100	65-90	35-55	25-30	5-10
	5-12	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
	12-60	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
Wages	0-4	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	80-90	35-55	25-30	5-10
	4-8	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-35	10-15
	8-13	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	80-100	35-80	25-30	5-10
	13-20	Loam	CL, SC, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-95	30-75	20-30	NP-10
	20-60	Sandy loam	CL, SC, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-95	30-75	20-30	NP-10
41:												
Kitcarson	0-6	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	6-15	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	15-22	Loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	22-28	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	28-34	Clay loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-80	25-30	5-10
	34-60	Sandy loam	SM, SP-SM, SW-SM	A-2-4, A-3, A-4	0	0	100	100	50-85	5-55	20-25	NP-5

Table 15.--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	
42:												
Kuma	0-6	Very fine sandy loam.	CL, CL-ML	A-4	0	0	100	100	85-95	50-65	25-30	5-10
	6-15	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-15
	15-23	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-15
	23-29	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-15
	29-36	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	36-60	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
Keith	0-9	Very fine sandy loam.	CL, CL-ML	A-4	0	0	100	100	85-95	50-65	25-30	5-10
	9-18	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-20
	18-32	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	32-50	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	50-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
43:												
Kuma	0-5	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-9	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-15
	9-16	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-15
	16-19	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-15
	19-24	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-15
	24-34	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-15
	34-43	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	43-56	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	56-61	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
Keith	0-6	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	6-9	Silt loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-20
	9-17	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-20
	17-24	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	24-34	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	34-41	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	41-47	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	47-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
44:												
Manter	0-6	Loamy sand	SC-SM, SM	A-2-4	0	0	100	100	50-75	15-30	20-25	NP-5
	6-9	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	9-22	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	22-40	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	40-60	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-80	15-50	20-25	NP-5

Table 15.--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	
45:												
Manter	0-6	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-9	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	9-22	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	22-40	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	40-60	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-80	15-50	20-25	NP-5
46:												
Manter	0-6	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-9	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	9-22	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	22-40	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	40-60	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-80	15-50	20-25	NP-5
47:												
Manter	0-6	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-9	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	9-22	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	22-40	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	40-60	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-80	15-50	20-25	NP-5
48:												
Manter	0-6	Sandy loam	SC, SC-SM	A-4, A-2-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-9	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	9-22	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	22-40	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	40-60	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-80	15-50	20-25	NP-5
Ascalon	0-6	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-10	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	10-21	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	21-37	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	37-50	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	50-60	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5
49:												
Manter	0-6	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-9	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	9-22	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	22-40	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-80	30-50	20-25	NP-5
	40-60	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	50-80	15-50	20-25	NP-5

Table 15.--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	
49:												
Otero----------	0-6	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-25	NP-5
	6-60	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-95	40-60	20-25	NP-5
50:												
Manzanst-------	0-3	Clay loam------	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	3-12	Clay-----------	CL	A-6, A-7-6	0	0	100	100	90-100	70-95	35-50	15-25
	12-37	Clay-----------	CL	A-7-6, A-6	0	0	100	100	90-100	70-95	35-50	15-25
	37-52	Clay-----------	CL	A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	10-20
	52-60	Clay-----------	CL	A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	10-20
51:												
Midway---------	0-4	Clay loam------	CL	A-6	0	0	75-100	75-100	70-100	55-80	30-40	10-20
	4-15	Clay-----------	CL	A-6, A-7-6	0	0	95-100	95-100	90-100	70-95	35-50	15-25
	15-19	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
Razor----------	0-4	Clay loam------	CL, ML	A-6, A-7-6	0	0	100	100	90-100	70-80	30-40	10-20
	4-10	Clay-----------	CH, CL	A-7	0	0	100	100	90-100	70-95	40-65	15-40
	10-25	Clay-----------	CH, CL, MH	A-6, A-7	0	0	90-100	90-100	90-100	75-95	35-65	10-40
	25-29	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
52:												
Norka----------	0-5	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-13	Silty clay loam	CL, ML	A-6	0	0	100	100	90-100	70-95	35-40	10-15
	13-28	Silt loam------	ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	28-39	Silt loam------	ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	39-49	Loam-----------	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	49-67	Loam-----------	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
53:												
Norka----------	0-5	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-13	Silty clay loam	CL, ML	A-6	0	0	100	100	90-100	70-95	35-40	10-15
	13-28	Silt loam------	ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	28-39	Silt loam------	ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	39-49	Loam-----------	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	49-67	Loam-----------	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10

Table 15.--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	
54:												
Norka	0-5	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-13	Silty clay loam	CL, ML	A-6	0	0	100	100	90-100	70-95	35-40	10-15
	13-28	Silt loam	ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	28-39	Silt loam	ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	39-49	Loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	49-67	Loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
Colby	0-4	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	4-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
55:												
Norka	0-3	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	3-10	Silty clay loam	CL, ML	A-6	0	0	100	100	90-100	70-95	35-40	10-15
	10-15	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	15-60	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
Colby	0-4	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	4-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
56:												
Norka	0-7	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	7-14	Silt loam	CL, ML	A-6	0	0	100	100	90-100	70-95	35-40	10-15
	14-18	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	18-60	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
Colby	0-3	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	3-8	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	8-30	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	30-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
57:												
Norka	0-3	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	3-10	Silty clay loam	CL, ML	A-6	0	0	100	100	90-100	70-95	35-40	10-15
	10-15	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	15-60	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
Colby	0-4	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	4-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
Weld	0-5	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-12	Silty clay	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	12-18	Silty clay	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	18-28	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	28-60	Silt loam	CL, CL-ML	A-4	0	0	100	100	90-100	60-90	25-30	5-10

Table 15.--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	
58:												
Nunn	0-8	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-90	35-55	30-35	10-15
	8-15	Clay	CL	A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	15-25
	15-17	Clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	15-25
	17-26	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-40	10-20
	26-44	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-40	10-20
	44-60	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-40	10-20
59:												
Nunn	0-5	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	5-11	Clay	CL	A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	15-25
	11-17	Clay loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-40	10-20
	17-23	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-40	10-20
	23-50	Sandy loam	ML, SC, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-90	30-55	20-30	NP-10
	50-60	Sandy loam	ML, SC, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-90	30-55	20-30	NP-10
60:												
Olnest	0-4	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	4-7	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	7-16	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	16-22	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	22-35	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	35-49	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	49-60	Sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
61:												
Olnest	0-4	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	4-7	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	7-16	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	16-22	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	22-35	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	35-49	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	49-60	Sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10

Table 15.--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	
62:												
Olnest	0-4	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	80-90	35-55	25-30	5-10
	4-11	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	11-18	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	18-23	Sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	23-42	Sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	42-55	Loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	55-60	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
Ascalon	0-6	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	6-10	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	10-21	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	100	60-90	30-55	25-35	5-15
	21-37	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	37-50	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	50-60	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-50	20-25	NP-5
63:												
Otero	0-6	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	20-25	NP-5
	6-60	Loamy very fine sand.	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-95	40-60	20-25	NP-5
64:												
Otero	0-5	Sandy loam	SC, SC-SM	A-2, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	5-18	Sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-95	40-60	20-25	NP-5
	18-39	Sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-95	40-60	20-25	NP-5
	39-60	Sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-95	40-60	20-25	NP-5

Table 15.--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	
64:												
Olnest---------	0-4	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	4-7	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	7-16	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	16-22	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	22-35	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	35-49	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-2-4	0	0	100	100	60-95	30-75	25-30	5-10
	49-60	Sandy loam-----	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
65:												
Oxyaquic Ustifluvents--	0-7	Loam-----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	7-11	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-3, A-4	0	0	100	100	50-95	5-65	20-25	NP-5
	11-30	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-3, A-4	0	0	100	100	50-95	5-65	20-25	NP-5
	30-35	Sand-----------	CL-ML, ML, SC-SM, SM	A-2-4, A-3, A-4	0	0	100	100	50-95	5-65	20-25	NP-5
	35-44	Silty clay loam	ML	A-6, A-7-6	0	0	100	100	95-100	85-95	35-50	10-20
	44-56	Silty clay loam	ML	A-6, A-7-6	0	0	100	100	95-100	85-95	35-50	10-20
	56-60	Silty clay-----	ML	A-6, A-7-6	0	0	100	100	95-100	85-95	35-50	10-20
	60-62	Coarse sand----	SM, SP-SM, SW-SM	A-1-b, A-2-4, A-3	0	0	100	100	45-70	5-15	---	NP
66:												
Paoli----------	0-6	Fine sandy loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	70-85	40-55	25-30	5-10
	6-14	Fine sandy loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	70-85	40-55	25-30	5-10
	14-28	Fine sandy loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	70-85	40-55	25-30	5-10
	28-34	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	25-30	5-10
	34-44	Sandy loam-----	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	44-55	Sandy loam-----	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10
	55-60	Fine sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0	100	100	60-95	30-75	25-30	5-10

Table 15.--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	
67:												
Pits, gravel---	0-6	Extremely gravelly sand.	GP, GW	A-1	---	0-25	10-25	5-25	0-15	0-5	0-14	NP
	6-60	Extremely gravelly sand.	GP, GW, SP, SW	A-1	---	0-25	10-55	5-50	0-15	0-5	0-14	NP
68:												
Platner--------	0-6	Loam-----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	6-11	Clay-----------	CL	A-6, A-7	0	0	100	100	90-100	70-95	35-45	15-20
	11-20	Clay-----------	CL	A-6, A-7	0	0	100	100	90-100	70-95	35-45	15-20
	20-27	Loam-----------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-95	35-75	25-35	5-15
	27-37	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0	100	100	60-90	30-55	25-30	5-10
	37-60	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0	100	100	60-90	30-55	25-30	5-10
69:												
Pleasant-------	0-5	Silty clay loam	ML	A-7	0	0	100	100	95-100	85-95	40-45	10-15
	5-10	Silty clay-----	MH, ML	A-7	0	0	100	100	95-100	85-95	45-70	15-35
	10-47	Silty clay-----	ML, MH	A-7	0	0	100	100	95-100	85-95	45-70	15-35
	47-56	Silty clay-----	ML, MH	A-7	0	0	100	100	95-100	85-95	45-70	15-35
	56-60	Silty clay loam	MH, ML	A-7	0	0	100	100	95-100	85-95	45-70	15-35
70:												
Rago-----------	0-4	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	4-10	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	10-24	Silty clay loam	ML	A-7	0	0	100	100	95-100	85-95	40-45	10-15
	24-40	Silty clay loam	ML	A-7	0	0	100	100	95-100	85-95	40-45	10-15
	40-54	Silt loam------	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0	100	100	60-100	30-90	25-30	5-10
	54-62	Silt loam------	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0	100	100	60-100	30-90	25-30	5-10
71:												
Rago-----------	0-4	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	4-22	Silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	35-40	15-20
	22-32	Silty clay loam	MH, ML	A-6, A-7	0	0	100	100	95-100	85-95	35-55	10-20
	32-48	Silty clay loam	MH, ML	A-6, A-7	0	0	100	100	95-100	85-95	35-55	10-20
	48-50	Silty clay loam	MH, ML	A-6, A-7	0	0	100	100	95-100	85-95	35-55	10-20
	50-70	Silt loam------	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	60-100	40-90	25-30	5-10
Weld-----------	0-5	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-12	Silty clay-----	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	12-18	Silty clay-----	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	18-28	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	28-60	Silt loam------	CL, CL-ML	A-4	0	0	100	100	90-100	60-90	25-30	5-10

Table 15.--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	
72:												
Richfield------	0-5	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-15	Silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	95-100	85-95	40-55	15-25
	15-23	Silty clay loam	ML	A-4, A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	5-20
	23-37	Silt loam------	ML	A-4, A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	5-20
	37-60	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-40	5-20
73:												
Richfield------	0-7	Silty clay loam	ML	A-6, A-7-6	0	0	100	100	95-100	85-95	35-45	10-20
	7-15	Silty clay-----	CH, CL, MH, ML	A-7	0	0	100	100	95-100	85-95	40-55	15-25
	15-21	Silty clay loam	ML	A-4, A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	5-20
	21-27	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-40	5-20
	27-60	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-40	5-20
74:												
Richfield------	0-5	Silty clay loam	ML	A-6, A-7-6	0	0	100	100	95-100	85-95	35-45	10-20
	5-15	Silty clay-----	CH, CL, MH, ML	A-7	0	0	100	100	95-100	85-95	40-55	15-25
	15-24	Silty clay loam	ML	A-4, A-6, A-7-6	0	0	100	100	90-100	70-95	30-45	5-20
	24-27	Silty clay loam	ML	A-6, A-7-6, A-4	0	0	100	100	90-100	70-95	30-45	5-20
	27-49	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-40	5-20
	49-60	Clay loam------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-40	5-20
75:												
Sampson--------	0-6	Loam-----------	CL, CL-ML	A-4	0	0	95-100	90-100	75-95	55-70	25-30	5-10
	6-10	Clay loam------	CL	A-6	0	0	85-100	80-100	65-90	50-75	25-40	10-20
	10-20	Clay loam------	CL	A-6	0	0	85-100	80-100	65-90	50-75	25-40	10-20
	20-29	Clay loam------	CL	A-6	0	0	85-100	80-100	65-90	50-75	25-40	10-20
	29-38	Clay loam------	CL	A-6	0	0	85-100	80-100	65-90	50-75	25-40	10-20
	38-60	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4	0	0	85-100	80-100	60-90	35-70	25-30	5-10

Table 15.--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	
76:												
Satanta	0-4	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	4-7	Clay loam	CL	A-6	0	0	90-100	85-100	70-100	50-75	30-40	10-20
	7-14	Clay loam	CL	A-6	0	0	90-100	85-100	70-100	50-75	30-40	10-20
	14-19	Clay loam	CL	A-6	0	0	90-100	85-100	70-100	50-75	30-40	10-20
	19-23	Clay loam	CL, SC	A-6	0	0	90-100	85-100	65-95	35-80	30-40	10-20
	23-34	Loam	CL, SC	A-6	0	0	90-100	85-100	65-95	35-80	30-40	10-20
	34-60	Loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0	90-100	85-100	60-95	30-75	20-25	5-10
77:												
Satanta	0-5	Loam	CL, CL-ML	A-4	0	0	100	95-100	85-95	60-75	25-30	5-10
	5-8	Loam	CL, CL-ML	A-4	0	0	100	95-100	85-95	60-75	25-30	5-10
	8-16	Clay loam	CL	A-6	0	0	100	95-100	90-100	70-80	30-40	10-20
	16-21	Loam	CL, CL-ML, ML	A-4	0	0	100	95-100	85-95	60-85	20-30	NP-10
	21-28	Loam	CL, CL-ML, ML	A-4	0	0	100	95-100	85-95	60-85	20-30	NP-10
	28-60	Loam	CL, CL-ML, ML	A-4	0	0	100	95-100	85-95	60-85	20-30	NP-10
Colby	0-3	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	3-12	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	12-28	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	28-60	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
78:												
Satanta	0-4	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	4-7	Clay loam	CL	A-6	0	0	90-100	85-100	70-100	50-75	30-40	10-20
	7-14	Clay loam	CL	A-6	0	0	90-100	85-100	70-100	50-75	30-40	10-20
	14-19	Clay loam	CL	A-6	0	0	90-100	85-100	70-100	50-75	30-40	10-20
	19-23	Clay loam	CL, SC	A-6	0	0	90-100	85-100	65-95	35-80	30-40	10-20
	23-34	Loam	CL, SC	A-6	0	0	90-100	85-100	65-95	35-80	30-40	10-20
	34-60	Loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0	90-100	85-100	60-95	30-75	20-25	5-10
Sampson	0-6	Loam	CL, CL-ML	A-4	0	0	95-100	90-100	75-95	55-70	25-30	5-10
	6-10	Clay loam	CL	A-6	0	0	85-100	80-100	65-90	50-75	25-40	10-20
	10-20	Clay loam	CL	A-6	0	0	85-100	80-100	65-90	50-75	25-40	10-20
	20-29	Clay loam	CL	A-6	0	0	85-100	80-100	65-90	50-75	25-40	10-20
	29-38	Clay loam	CL	A-6	0	0	85-100	80-100	65-90	50-75	25-40	10-20
	38-60	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4	0	0	85-100	80-100	60-90	35-70	25-30	5-10

Table 15.--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	
79:												
Satanta	0-4	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	4-7	Clay loam	CL	A-6	0	0	90-100	85-100	70-100	50-75	30-40	10-20
	7-14	Clay loam	CL	A-6	0	0	90-100	85-100	70-100	50-75	30-40	10-20
	14-19	Clay loam	CL	A-6	0	0	90-100	85-100	70-100	50-75	30-40	10-20
	19-23	Clay loam	CL, SC	A-6	0	0	90-100	85-100	65-95	35-80	30-40	10-20
	23-34	Loam	CL, SC	A-6	0	0	90-100	85-100	65-95	35-80	30-40	10-20
	34-60	Loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0	90-100	85-100	60-95	30-75	20-25	5-10
Ulmet	0-4	Loam	CL, CL-ML	A-4	0	0	95-100	90-100	75-95	50-75	25-30	5-10
	4-7	Clay loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	70-95	35-45	15-25
	7-12	Clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-100	70-95	35-45	15-25
	12-17	Clay	CL	A-6, A-7	0	0	95-100	90-100	80-100	70-95	35-45	15-25
	17-26	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-100	35-80	25-40	5-15
	26-37	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-100	35-80	25-40	5-15
	37-60	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-100	35-80	25-40	5-15
80:												
Stoneham	0-3	Loam	CL, CL-ML	A-4	0	0	95-100	90-100	75-95	55-75	25-30	5-10
	3-6	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
	6-10	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
	10-27	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
	27-60	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
81:												
Stoneham	0-3	Loam	CL, CL-ML	A-4	0	0	95-100	90-100	75-95	55-75	25-30	5-10
	3-6	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
	6-10	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
	10-27	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
	27-60	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15

Table 15.--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	
81:												
Fort Collins---	0-5	Loam----------	CL, CL-ML	A-4	0	0	95-100	90-100	80-90	60-70	25-30	5-10
	5-9	Loam----------	CL, CL-ML	A-4	0	0	95-100	90-100	80-90	60-70	25-30	5-10
	9-19	Clay loam------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-75	25-35	5-15
	19-26	Clay loam------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-75	25-35	5-15
	26-60	Loam----------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-75	25-35	5-15
82:												
Stoneham-------	0-3	Loam----------	CL, CL-ML	A-4	0	0	95-100	90-100	75-95	55-75	25-30	5-10
	3-6	Clay loam------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
	6-10	Clay loam------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
	10-27	Loam----------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
	27-60	Loam----------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	75-95	45-75	25-35	5-15
Kimst----------	0-6	Loam----------	CL, CL-ML	A-4	0	0	95-100	85-100	75-90	60-75	25-30	5-10
	6-12	Loam----------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
	12-60	Loam----------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
Fort Collins---	0-5	Loam----------	CL, CL-ML	A-4	0	0	95-100	90-100	80-90	60-70	25-30	5-10
	5-9	Loam----------	CL, CL-ML	A-4	0	0	95-100	90-100	80-90	60-70	25-30	5-10
	9-19	Clay loam------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-75	25-35	5-15
	19-26	Clay loam------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-75	25-35	5-15
	26-60	Loam----------	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-75	25-35	5-15
83:												
Ulmet----------	0-4	Loam----------	CL, CL-ML	A-4	0	0	95-100	90-100	75-95	50-75	25-30	5-10
	4-7	Clay loam------	CL	A-6, A-7	0	0	95-100	90-100	80-100	70-95	35-45	15-25
	7-12	Clay loam------	CL	A-6, A-7	0	0	95-100	90-100	80-100	70-95	35-45	15-25
	12-17	Clay----------	CL	A-6, A-7	0	0	95-100	90-100	80-100	70-95	35-45	15-25
	17-26	Clay loam------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-100	35-80	25-40	5-15
	26-37	Clay loam------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-100	35-80	25-40	5-15
	37-60	Clay loam------	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-100	35-80	25-40	5-15

Table 15.--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	
84:												
Ulysses	0-4	Silt loam	ML	A-4	0	0	100	100	90-100	70-100	30-35	5-10
	4-10	Silt loam	ML	A-4	0	0	100	100	90-100	70-100	30-35	5-10
	10-19	Silt loam	ML	A-4	0	0	100	100	90-100	70-95	30-35	5-10
	19-60	Silt loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
85:												
Valent	0-8	Sand	SM, SP-SM, SW-SM	A-2, A-3	0	0	100	100	50-70	5-15	---	NP
	8-60	Fine sand	SM, SP-SM, SW-SM	A-2, A-3	0	0	100	100	50-80	5-35	---	NP
86:												
Valent	0-4	Sand	SM, SP-SM, SW-SM	A-2, A-3	0	0	100	100	50-70	5-15	---	NP
	4-7	Fine sand	SM, SP-SM, SW-SM	A-2, A-3	0	0	100	100	50-80	5-35	---	NP
	7-60	Fine sand	SM, SP-SM, SW-SM	A-2, A-3	0	0	100	100	50-80	5-35	---	NP
87:												
Valent	0-9	Loamy sand	SM	A-2	0	0	100	100	50-75	15-30	---	NP
	9-14	Loamy sand	SM, SP-SM, SW-SM	A-2, A-3	0	0	100	100	50-80	5-35	---	NP
	14-60	Loamy sand	SM, SP-SM, SW-SM	A-2, A-3	0	0	100	100	50-80	5-35	---	NP
88:												
Valent	0-9	Loamy sand	SM	A-2	0	0	100	100	50-75	15-30	---	NP
	9-14	Loamy sand	SM, SP-SM, SW-SM	A-2, A-3	0	0	100	100	50-80	5-35	---	NP
	14-60	Loamy sand	SM, SP-SM, SW-SM	A-2, A-3	0	0	100	100	50-80	5-35	---	NP

Table 15.--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	
89:												
Vona	0-5	Fine sandy loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	70-85	40-55	25-30	5-10
	5-10	Sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	90-100	60-85	30-55	20-25	NP-5
	10-15	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	90-100	60-85	30-55	20-25	NP-5
	15-25	Fine sandy loam	SC-SM, SM, CL-ML, ML	A-2-4, A-4	0	0	100	90-100	60-85	30-55	20-25	NP-5
	25-33	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	90-100	60-85	30-55	20-25	NP-5
	33-42	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	90-100	60-85	30-55	20-25	NP-5
	42-61	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	90-100	60-85	30-55	20-25	NP-5
90:												
Wages	0-5	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	5-12	Loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-35	10-15
	12-17	Loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	80-100	35-80	25-30	5-10
	17-60	Loam	CL, SC, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-95	30-75	20-30	NP-10
91:												
Wages	0-5	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	5-12	Loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-35	10-15
	12-17	Loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	80-100	35-80	25-30	5-10
	17-60	Loam	CL, SC, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-95	30-75	20-30	NP-10
92:												
Wages	0-5	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	5-12	Loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-35	10-15
	12-17	Loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	80-100	35-80	25-30	5-10
	17-60	Loam	CL, SC, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-95	30-75	20-30	NP-10
93:												
Wages	0-5	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	5-12	Loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-35	10-15
	12-17	Loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	80-100	35-80	25-30	5-10
	17-60	Loam	CL, SC, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-95	30-75	20-30	NP-10

Table 15.--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	
93:												
Kimst	0-6	Loam	CL, CL-ML	A-4	0	0	95-100	85-100	75-90	60-75	25-30	5-10
	6-12	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
	12-60	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	85-100	65-95	35-80	25-35	5-15
94:												
Wages	0-5	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	5-12	Loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-35	10-15
	12-17	Loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	80-100	35-80	25-30	5-10
	17-60	Loam	CL, SC, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-95	30-75	20-30	NP-10
Weld	0-5	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-12	Silty clay	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	12-18	Silty clay	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	18-28	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	28-60	Silt loam	CL, CL-ML	A-4	0	0	100	100	90-100	60-90	25-30	5-10
95:												
Weld	0-5	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-12	Silty clay	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-25
	12-18	Silty clay	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	18-28	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	28-60	Silt loam	CL, CL-ML	A-4	0	0	100	100	90-100	60-90	25-30	5-10
96:												
Weld	0-5	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-12	Silty clay	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	12-18	Silty clay	ML	A-7	0	0	100	100	95-100	85-95	45-50	15-20
	18-28	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	28-60	Silt loam	CL, CL-ML	A-4	0	0	100	100	90-100	60-90	25-30	5-10
Norka	0-5	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	5-13	Silty clay loam	CL, ML	A-6	0	0	100	100	90-100	70-95	35-40	10-15
	13-28	Silt loam	ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	28-39	Silt loam	ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	39-49	Loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	49-67	Loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10

Table 15.--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	
97:												
Wiley----------	0-4	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
	4-10	Silty clay loam	CL, ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	10-18	Silty clay loam	CL, ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	18-23	Silty clay loam	CL, ML	A-4, A-6	0	0	100	100	90-100	70-95	30-40	5-15
	23-60	Silt loam------	ML	A-4	0	0	100	100	90-100	70-90	30-35	5-10
98:												
Water.												

Table 16.--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 the data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
1:												
Ascalon	0-6	13-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-10	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	1.0-2.0	.28	.28			
	10-21	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	0.5-1.0	.28	.28			
	21-37	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	37-50	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	50-60	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			
2:												
Ascalon	0-6	13-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-10	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	1.0-2.0	.28	.28			
	10-21	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	0.5-1.0	.28	.28			
	21-37	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	37-50	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	50-60	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			
3:												
Ascalon	0-6	13-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-10	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	1.0-2.0	.28	.28			
	10-21	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	0.5-1.0	.28	.28			
	21-37	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	37-50	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	50-60	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			
4:												
Ascalon	0-4	5-15	1.30-1.40	2-6	0.11-0.16	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-7	5-15	1.30-1.40	2-6	0.11-0.16	0.0-2.9	1.0-2.0	.24	.24			
	7-14	18-35	1.35-1.45	0.6-2	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20			
	14-18	18-35	1.35-1.45	0.6-2	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20			
	18-25	18-30	1.35-1.45	0.6-2	0.12-0.15	0.0-2.9	0.5-1.0	.20	.20			
	25-60	3-12	1.45-1.50	2-6	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
5:												
Ascalon	0-4	20-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	6	48
	4-7	20-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28			
	7-12	20-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.28	.28			
	12-22	20-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.28	.28			
	22-41	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	41-60	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			
6:												
Ascalon	0-4	20-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	6	48
	4-7	20-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28			
	7-12	20-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.28	.28			
	12-22	20-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.28	.28			
	22-41	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	41-60	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			
7:												
Ascalon	0-4	20-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	6	48
	4-7	20-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28			
	7-12	20-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.28	.28			
	12-22	20-35	1.25-1.50	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.28	.28			
	22-41	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	41-60	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
8:												
Ascalon	0-3	20-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	6	48
	3-10	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	1.0-2.0	.28	.28			
	10-15	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	0.5-1.0	.28	.28			
	15-24	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	0.5-1.0	.28	.28			
	24-31	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			
	31-60	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			
Eckley	0-4	15-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	3	5	56
	4-12	20-35	1.25-1.40	0.6-2	0.10-0.18	3.0-5.9	1.0-2.0	.10	.20			
	12-15	10-20	1.35-1.50	2-6	0.07-0.10	0.0-2.9	0.5-2.0	.15	.28			
	15-22	0-5	1.45-1.60	6-20	0.03-0.06	0.0-2.9	0.5-1.0	.05	.17			
	22-60	0-5	1.45-1.60	6-20	0.03-0.06	0.0-2.9	0.5-1.0	.05	.17			
9:												
Ascalon	0-6	13-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-10	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	1.0-2.0	.28	.28			
	10-21	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	0.5-1.0	.28	.28			
	21-37	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	37-50	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	50-60	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			
Haxtun	0-9	7-19	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-4.0	.24	.24	5	3	86
	9-24	15-30	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	1.0-3.0	.17	.17			
	24-30	20-35	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-2.0	.20	.20			
	30-40	20-35	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-2.0	.20	.20			
	40-48	20-35	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-2.0	.20	.20			
	48-58	8-23	1.25-1.60	0.6-20	0.06-0.18	0.0-2.9	0.0-0.5	.32	.32			
	58-72	8-23	1.25-1.60	0.6-20	0.06-0.18	0.0-2.9	0.0-0.5	.32	.32			
10:												
Bayard	0-5	10-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	5-15	10-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24			
	15-21	10-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	21-36	10-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	36-60	5-15	1.45-1.60	6-20	0.07-0.10	0.0-2.9	0.5-1.0	.28	.28			
11:												
Beckton	0-2	20-24	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.37	.37	2	4L	86
	2-4	32-36	1.15-1.30	0.06-0.2	0.17-0.21	0.0-2.9	1.0-2.0	.28	.28			
	4-8	35-40	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.32	.32			
	8-17	35-40	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.32	.32			
	17-24	35-40	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.32	.32			
	24-60	27-35	1.15-1.30	0.2-0.6	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
12:												
Bethune	0-4	32-36	1.15-1.30	0.0000-0.6	0.17-0.21	0.0-2.9	1.0-3.0	.28	.28	3	7	38
	4-11	40-45	1.15-1.30	0.06-0.2	0.14-0.17	3.0-5.9	1.0-2.0	.20	.20			
	11-17	35-45	1.15-1.40	0.06-0.2	0.14-0.21	0.0-2.9	1.0-2.0	.28	.28			
	17-25	30-35	1.25-1.40	0.2-0.6	0.13-0.16	0.0-2.9	0.5-1.0	.15	.24			
	25-29	---	---	0.06-0.2	---	---	---	---	---			
13:												
Canyon	0-3	12-20	1.25-1.40	0.6-2	0.10-0.13	0.0-2.9	0.5-1.0	.20	.37	2	4L	86
	3-7	16-25	1.25-1.40	0.6-2	0.13-0.16	0.0-2.9	0.5-1.0	.20	.37			
	7-10	16-25	1.25-1.40	0.6-2	0.13-0.16	0.0-2.9	0.5-1.0	.20	.37			
	10-14	---	---	0.2-0.6	---	---	---	---	---			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
14:												
Canyon	0-3	12-20	1.25-1.40	0.6-2	0.10-0.13	0.0-2.9	0.5-1.0	.20	.37	2	4L	86
	3-7	16-25	1.25-1.40	0.6-2	0.13-0.16	0.0-2.9	0.5-1.0	.20	.37			
	7-10	16-25	1.25-1.40	0.6-2	0.13-0.16	0.0-2.9	0.5-1.0	.20	.37			
	10-14	---	---	0.2-0.6	---	---	---	---	---			
Rock outcrop	0-60	0-0	---	---	0.00-0.00	---	---	---	---	---	8	0
15:												
Colby	0-4	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	4-60	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
16:												
Colby	0-6	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	6-12	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43			
	12-30	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	30-60	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
17:												
Colby	0-3	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	3-8	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43			
	8-30	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	30-60	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
18:												
Colby	0-5	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	5-16	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	16-32	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	32-60	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
19:												
Colby	0-5	27-32	1.15-1.30	0.6-2	0.17-0.21	3.0-5.9	0.5-2.0	.32	.32	5	4L	86
	5-19	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	19-42	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	42-62	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
20:												
Colby	0-4	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	4-33	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	33-60	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
Aridic Ustorthents	0-4	15-18	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37	5	4L	86
	4-8	12-20	1.25-1.50	0.6-6	0.07-0.18	0.0-2.9	0.5-1.0	.20	.37			
	8-17	12-20	1.25-1.50	0.6-6	0.07-0.18	0.0-2.9	0.5-1.0	.20	.37			
	17-35	12-20	1.25-1.50	0.6-6	0.07-0.18	0.0-2.9	0.5-1.0	.20	.37			
	35-63	12-20	1.25-1.50	0.6-6	0.07-0.18	0.0-2.9	0.5-1.0	.20	.37			
21:												
Concordia	0-2	13-26	1.25-1.40	0.6-2	0.11-0.14	0.0-2.9	0.5-2.0	.37	.37	2	4L	86
	2-6	35-50	1.15-1.40	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	6-13	35-50	1.15-1.40	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	13-24	35-50	1.15-1.40	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	24-38	35-50	1.15-1.40	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	38-47	22-42	1.25-1.35	0.06-2	0.10-0.15	3.0-5.9	0.5-1.0	.28	.28			
	47-56	22-42	1.25-1.35	0.06-2	0.10-0.15	3.0-5.9	0.5-1.0	.28	.28			
	56-80	22-42	1.25-1.35	0.06-2	0.10-0.15	3.0-5.9	0.5-1.0	.28	.28			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
22:												
Eckley	0-4	10-20	1.35-1.50	2-6	0.07-0.10	0.0-2.9	1.0-2.0	.15	.24	3	3	86
	4-12	20-35	1.25-1.40	0.6-2	0.10-0.18	3.0-5.9	1.0-2.0	.10	.20			
	12-15	10-20	1.35-1.50	2-6	0.07-0.10	0.0-2.9	0.5-2.0	.15	.28			
	15-22	0-5	1.45-1.60	6-20	0.03-0.06	0.0-2.9	0.5-1.0	.05	.17			
	22-60	0-5	1.45-1.60	6-20	0.03-0.06	0.0-2.9	0.5-1.0	.05	.17			
Wages	0-5	16-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	5	56
	5-12	25-33	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	1.0-2.0	.24	.24			
	12-17	20-30	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	17-60	10-27	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
23:												
Fort Collins	0-5	15-22	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	5-9	15-22	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.28	.28			
	9-19	18-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	19-26	18-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.37	.37			
	26-60	18-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.37	.37			
24:												
Glenberg	0-5	10-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	5-9	8-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	9-17	8-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	17-28	8-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	28-32	8-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	32-60	8-18	1.35-1.60	2-20	0.06-0.15	0.0-2.9	0.0-1.0	.28	.28			
25:												
Glenberg	0-4	10-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	4-13	8-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	13-21	8-18	1.35-1.60	2-20	0.06-0.15	0.0-2.9	0.0-1.0	.28	.28			
	21-60	8-18	1.35-1.60	2-20	0.06-0.15	0.0-2.9	0.0-1.0	.28	.28			
Bankard	0-4	2-10	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	4-60	0-10	1.75-1.85	6-20	0.05-0.08	0.0-2.9	0.5-1.0	.17	.17			
26:												
Goshen	0-4	21-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	2.0-4.0	.32	.32	5	6	48
	4-19	21-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	2.0-4.0	.32	.32			
	19-32	24-33	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-2.0	.43	.43			
	32-45	24-33	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-2.0	.43	.43			
	45-52	24-33	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-2.0	.43	.43			
	52-60	20-26	1.25-1.30	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.43	.43			
27:												
Haverson	0-5	10-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37	5	4L	86
	5-14	10-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37			
	14-60	18-35	1.35-1.40	0.6-2	0.14-0.18	0.0-2.9	0.0-0.5	.24	.24			
28:												
Haxtun	0-6	2-10	1.45-1.60	6-20	0.06-0.08	0.0-2.9	1.0-3.0	.17	.17	5	2	134
	6-13	15-30	1.25-1.50	2-6	0.10-0.18	0.0-2.9	1.0-3.0	.17	.17			
	13-18	15-30	1.25-1.50	0.6-2	0.10-0.18	0.0-2.9	1.0-3.0	.17	.17			
	18-26	15-30	1.25-1.50	0.6-2	0.10-0.18	0.0-2.9	1.0-3.0	.17	.17			
	26-39	15-30	1.25-1.50	0.6-2	0.10-0.18	0.0-2.9	1.0-3.0	.17	.17			
	39-43	15-30	1.25-1.50	0.6-2	0.10-0.18	0.0-2.9	1.0-3.0	.17	.17			
	43-52	8-23	1.25-1.60	6-20	0.06-0.18	0.0-2.9	0.0-0.5	.32	.32			
	52-61	8-23	1.25-1.60	6-20	0.06-0.18	0.0-2.9	0.0-0.5	.32	.32			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
29:												
Iliff	0-6	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	2	6	48
	6-9	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37			
	9-15	35-50	1.15-1.30	0.06-0.2	0.14-0.21	6.0-8.9	1.0-2.0	.32	.32			
	15-20	30-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-6.0	0.5-1.0	.32	.32			
	20-25	30-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-6.0	0.5-1.0	.32	.32			
	25-31	20-35	1.25-1.40	0.2-2	0.14-0.21	0.0-6.0	0.5-1.0	.24	.24			
	31-36	20-35	1.25-1.40	0.2-2	0.14-0.21	0.0-6.0	0.5-1.0	.24	.24			
	36-40	---	---	0.06-0.2	---	---	---	---	---			
30:												
Julesburg	0-8	3-10	1.45-1.60	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.17	.17	5	2	134
	8-14	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.28	.28			
	14-34	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28			
	34-42	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28			
	42-62	0-12	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.24	.24			
31:												
Julesburg	0-8	3-10	1.45-1.60	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.17	.17	5	2	134
	8-14	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.28	.28			
	14-34	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28			
	34-42	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28			
	42-62	0-12	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.24	.24			
32:												
Julesburg	0-5	7-10	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	5-12	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.28	.28			
	12-30	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28			
	30-42	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28			
	42-60	0-12	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.24	.24			
33:												
Julesburg	0-5	7-10	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	5-12	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.28	.28			
	12-30	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28			
	30-42	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28			
	42-60	0-12	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.24	.24			
34:												
Julesburg	0-5	7-10	1.35-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	5-12	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.28	.28			
	12-30	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28			
	30-42	10-18	1.30-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.28	.28			
	42-60	0-12	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.24	.24			
Otero	0-6	9-15	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.0-1.0	.28	.28	5	3	86
	6-60	9-16	1.35-1.60	2-20	0.09-0.15	0.0-2.9	0.0-0.5	.37	.37			
35:												
Keith	0-6	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	6-14	26-35	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	1.0-2.0	.32	.32			
	14-20	26-35	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-2.0	.32	.32			
	20-37	18-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	37-60	18-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
36:												
Kimst	0-6	21-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37	5	4L	86
	6-12	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
	12-60	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
37:												
Kimst	0-5	21-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37	5	4L	86
	5-22	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
	22-60	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
38:												
Kimst	0-4	21-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37	5	4L	86
	4-7	21-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37			
	7-30	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
	30-60	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
Canyon	0-3	12-20	1.25-1.40	0.6-2	0.13-0.16	0.0-2.9	0.5-1.0	.37	.37	2	4L	86
	3-7	12-25	1.25-1.40	0.6-2	0.10-0.13	0.0-2.9	0.5-1.0	.20	.37			
	7-13	12-25	1.25-1.40	0.6-2	0.10-0.13	0.0-2.9	0.5-1.0	.20	.37			
	13-17	---	---	0.2-0.6	---	---	---	---	---			
39:												
Kimst	0-4	27-31	1.25-1.40	0.6-2	0.17-0.21	0.0-2.9	0.5-2.0	.24	.24	5	4L	86
	4-12	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
	12-20	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
	20-41	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
	41-60	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
Richfield	0-5	27-35	1.15-1.30	0.2-0.6	0.17-0.21	3.0-5.9	1.0-3.0	.28	.28	5	7	38
	5-15	35-42	1.15-1.30	0.2-0.6	0.14-0.21	6.0-8.9	1.0-2.0	.32	.32			
	15-24	20-35	1.15-1.30	0.2-2	0.17-0.21	3.0-5.9	0.5-1.0	.32	.32			
	24-27	20-35	1.15-1.30	0.2-2	0.17-0.21	3.0-5.9	0.5-1.0	.32	.32			
	27-49	18-35	1.25-1.30	0.2-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	49-60	18-35	1.25-1.30	0.2-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
40:												
Kimst	0-5	21-31	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.20	.20	5	5	56
	5-12	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
	12-60	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
Wages	0-4	21-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.17	.17	5	5	56
	4-8	25-33	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	1.0-2.0	.24	.24			
	8-13	20-30	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	13-20	10-27	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	20-60	10-27	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
41:												
Kitcarson	0-6	16-21	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37	4	4L	86
	6-15	16-21	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37			
	15-22	13-16	1.25-1.30	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.37	.37			
	22-28	13-16	1.25-1.30	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.37	.37			
	28-34	22-27	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	34-60	3-10	1.25-1.60	2-20	0.05-0.15	0.0-2.9	0.5-1.0	.28	.28			
42:												
Kuma	0-6	14-18	1.35-1.50	2-6	0.14-0.17	0.0-2.9	1.0-3.0	.28	.28	5	3	86
	6-15	22-35	1.15-1.30	0.6-2	0.15-0.21	0.0-2.9	1.0-2.0	.28	.28			
	15-23	22-35	1.15-1.30	0.6-2	0.15-0.21	0.0-2.9	1.0-2.0	.28	.28			
	23-29	25-35	1.15-1.30	0.6-2	0.15-0.21	0.0-2.9	0.5-2.0	.32	.32			
	29-36	16-25	1.25-1.30	0.6-6	0.14-0.20	0.0-2.9	0.5-1.0	.37	.37			
	36-60	16-25	1.25-1.30	0.6-6	0.14-0.20	0.0-2.9	0.5-1.0	.37	.37			
Keith	0-9	15-20	1.35-1.50	2-6	0.14-0.17	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	9-18	26-35	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-2.0	.32	.32			
	18-32	18-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	32-50	18-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	50-60	18-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
43:												
Kuma	0-5	20-27	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-4.0	.37	.37	5	6	48
	5-9	22-35	1.15-1.30	0.6-2	0.15-0.21	0.0-2.9	1.0-2.0	.28	.28			
	9-16	22-35	1.15-1.30	0.6-2	0.15-0.21	0.0-2.9	1.0-2.0	.28	.28			
	16-19	22-35	1.15-1.30	0.6-2	0.15-0.21	0.0-2.9	1.0-2.0	.28	.28			
	19-24	25-35	1.15-1.30	0.6-2	0.15-0.21	0.0-2.9	0.5-2.0	.32	.32			
	24-34	25-35	1.15-1.30	0.6-2	0.15-0.21	0.0-2.9	0.5-2.0	.32	.32			
	34-43	16-25	1.25-1.30	0.6-6	0.14-0.20	0.0-2.9	0.5-1.0	.37	.37			
	43-56	16-25	1.25-1.30	0.6-6	0.14-0.20	0.0-2.9	0.5-1.0	.37	.37			
	56-61	16-25	1.25-1.30	0.6-6	0.14-0.20	0.0-2.9	0.5-1.0	.37	.37			
Keith	0-6	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	6-9	26-35	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	1.0-2.0	.32	.32			
	9-17	26-35	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-2.0	.32	.32			
	17-24	27-34	1.15-1.30	0.6-2	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
	24-34	18-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	34-41	18-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	41-47	18-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	47-60	18-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
44:												
Manter	0-6	5-10	1.45-1.60	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.17	.17	5	2	134
	6-9	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	1.0-2.0	.28	.28			
	9-22	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	22-40	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	40-60	5-15	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
45:												
Manter	0-6	10-20	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-9	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	1.0-2.0	.28	.28			
	9-22	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	22-40	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	40-60	5-15	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
46:												
Manter	0-6	10-20	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-9	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	1.0-2.0	.28	.28			
	9-22	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	22-40	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	40-60	5-15	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
47:												
Manter	0-6	10-20	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-9	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	1.0-2.0	.28	.28			
	9-22	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	22-40	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	40-60	5-15	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
48:												
Manter	0-6	10-20	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-9	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	1.0-2.0	.28	.28			
	9-22	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	22-40	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	40-60	5-15	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
Ascalon	0-6	13-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-10	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	1.0-2.0	.28	.28			
	10-21	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	0.5-1.0	.28	.28			
	21-37	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	37-50	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	50-60	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
49:												
Manter	0-6	10-20	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-9	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	1.0-2.0	.28	.28			
	9-22	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	22-40	9-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	40-60	5-15	1.35-1.60	2-20	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
Otero	0-6	9-15	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.0-1.0	.28	.28	5	3	86
	6-60	9-16	1.35-1.60	2-20	0.09-0.15	0.0-2.9	0.0-0.5	.37	.37			
50:												
Manzanst	0-3	27-35	1.25-1.40	0.2-0.6	0.17-0.21	3.0-5.9	1.0-2.0	.20	.20	5	4L	86
	3-12	35-50	1.15-1.40	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.32	.32			
	12-37	35-50	1.15-1.40	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.32	.32			
	37-52	30-45	1.15-1.40	0.0000-0.6	0.14-0.21	3.0-5.9	0.0-0.5	.28	.28			
	52-60	30-45	1.15-1.40	0.0000-0.6	0.14-0.21	3.0-5.9	0.0-0.5	.28	.28			
51:												
Midway	0-4	30-40	1.25-1.40	0.06-0.2	0.17-0.21	3.0-5.9	0.5-2.0	.24	.24	2	4L	86
	4-15	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	0.0-0.5	.37	.37			
	15-19	---	---	0.06-0.2	---	---	---	---	---			
Razor	0-4	28-40	1.25-1.40	0.06-0.2	0.17-0.21	3.0-5.9	0.5-2.0	.24	.24	3	4L	86
	4-10	35-60	1.15-1.30	0.06-0.2	0.14-0.17	6.0-8.9	0.5-1.0	.24	.24			
	10-25	35-60	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	0.0-0.5	.28	.28			
	25-29	---	---	0.06-0.2	---	---	---	---	---			
52:												
Norka	0-5	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	5-13	25-34	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	1.0-2.0	.37	.37			
	13-28	22-32	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	28-39	22-32	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	39-49	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	49-67	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
53:												
Norka	0-5	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	5-13	25-34	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	1.0-2.0	.37	.37			
	13-28	22-32	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	28-39	22-32	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	39-49	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	49-67	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
54:												
Norka	0-5	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	5-13	25-34	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	1.0-2.0	.37	.37			
	13-28	22-32	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	28-39	22-32	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	39-49	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	49-67	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
Colby	0-4	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	4-60	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
55:												
Norka	0-3	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	3-10	25-34	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	1.0-2.0	.37	.37			
	10-15	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	15-60	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
Colby	0-4	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	4-60	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
56:												
Norka	0-7	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	7-14	25-34	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	1.0-2.0	.37	.37			
	14-18	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	18-60	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
Colby	0-3	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	3-8	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43			
	8-30	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	30-60	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
57:												
Norka	0-3	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	3-10	25-34	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	1.0-2.0	.37	.37			
	10-15	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	15-60	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
Colby	0-4	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	4-60	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
Weld	0-5	19-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	5-12	35-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.24	.24			
	12-18	35-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.24	.24			
	18-28	28-39	1.15-1.30	0.06-0.2	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
	28-60	16-27	1.25-1.30	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.43	.43			
58:												
Nunn	0-8	27-32	1.25-1.40	0.2-0.6	0.14-0.18	3.0-5.9	1.0-3.0	.17	.17	5	5	56
	8-15	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	1.0-2.0	.24	.24			
	15-17	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	0.5-2.0	.24	.24			
	17-26	26-40	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	26-44	26-40	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.0-1.0	.24	.24			
	44-60	26-40	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.0-1.0	.24	.24			
59:												
Nunn	0-5	28-32	1.25-1.40	0.2-0.6	0.17-0.21	3.0-5.9	1.0-3.0	.20	.20	5	6	48
	5-11	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	1.0-2.0	.24	.24			
	11-17	26-40	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	17-23	26-40	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	23-50	10-30	1.25-1.50	0.2-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			
	50-60	10-30	1.25-1.50	0.2-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			
60:												
Olnest	0-4	12-17	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-7	12-17	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.24	.24			
	7-16	18-35	1.25-1.50	0.6-2	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	16-22	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	22-35	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	35-49	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	49-60	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
61:												
Olnest	0-4	12-17	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-7	12-17	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.24	.24			
	7-16	18-35	1.25-1.50	0.6-2	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	16-22	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	22-35	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	35-49	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	49-60	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
62:												
Olnest	0-4	20-26	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.17	.17	5	5	56
	4-11	18-35	1.25-1.50	0.6-2	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	11-18	18-35	1.25-1.50	0.6-2	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	18-23	18-32	1.25-1.50	0.6-2	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	23-42	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	42-55	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	55-60	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
Ascalon	0-6	13-18	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-10	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	1.0-2.0	.28	.28			
	10-21	18-33	1.25-1.50	0.6-2	0.10-0.18	3.0-5.9	0.5-1.0	.28	.28			
	21-37	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	37-50	20-30	1.25-1.40	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	50-60	3-10	1.35-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.28	.28			
63:												
Otero	0-6	9-15	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.0-1.0	.28	.28	5	3	86
	6-60	9-16	1.35-1.60	2-20	0.09-0.15	0.0-2.9	0.0-0.5	.37	.37			
64:												
Otero	0-5	10-20	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.0-1.0	.28	.28	5	3	86
	5-18	9-16	1.35-1.60	2-20	0.09-0.15	0.0-2.9	0.0-0.5	.37	.37			
	18-39	9-16	1.35-1.60	2-20	0.09-0.15	0.0-2.9	0.0-0.5	.37	.37			
	39-60	9-16	1.35-1.60	2-20	0.09-0.15	0.0-2.9	0.0-0.5	.37	.37			
Olnest	0-4	12-17	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-7	12-17	1.35-1.50	2-6	0.10-0.13	0.0-2.9	0.5-1.0	.24	.24			
	7-16	18-35	1.25-1.50	0.6-2	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	16-22	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	22-35	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	35-49	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
	49-60	12-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
65:												
Oxyaquic Ustifluvents	0-7	12-19	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.37	.37	5	4L	86
	7-11	3-17	1.35-1.60	6-20	0.15-0.17	0.0-2.9	0.5-1.0	.28	.28			
	11-30	3-17	1.35-1.60	6-20	0.15-0.17	0.0-2.9	0.5-1.0	.28	.28			
	30-35	3-17	1.35-1.60	6-20	0.15-0.17	0.0-2.9	0.5-1.0	.28	.28			
	35-44	31-42	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.32	.32			
	44-56	31-42	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.32	.32			
	56-60	31-42	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	0.5-1.0	.32	.32			
	60-62	2-4	1.45-1.60	20-20	0.03-0.08	0.0-2.9	0.5-1.0	.10	.10			
66:												
Paoli	0-6	12-17	1.35-1.50	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	6-14	12-17	1.35-1.50	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24			
	14-28	12-17	1.35-1.50	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24			
	28-34	10-16	1.35-1.50	2-6	0.10-0.13	0.0-2.9	1.0-2.0	.24	.24			
	34-44	12-18	1.25-1.50	2-6	0.10-0.18	0.0-2.9	1.0-2.0	.28	.28			
	44-55	12-18	1.25-1.50	2-6	0.10-0.18	0.0-2.9	1.0-2.0	.28	.28			
	55-60	12-18	1.25-1.50	2-6	0.10-0.18	0.0-2.9	1.0-2.0	.28	.28			
67:												
Pits, gravel	0-6	0-1	---	6-20	0.01-0.02	0.0-2.9	0.0-0.1	.02	---	--	8	0
	6-60	0-1	---	6-20	0.01-0.02	0.0-2.9	---	.02	---			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
68:												
Platner	0-6	12-26	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	3	5	56
	6-11	35-45	1.15-1.40	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	11-20	35-45	1.15-1.40	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	20-27	23-34	1.25-1.40	0.2-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	27-37	15-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.0-1.0	.24	.24			
	37-60	15-25	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.0-1.0	.24	.24			
69:												
Pleasant	0-5	35-40	1.15-1.30	0.06-0.2	0.17-0.21	0.0-2.9	2.0-4.0	.24	.24	5	4	86
	5-10	37-60	1.15-1.30	0.06-0.2	0.14-0.21	6.0-8.9	2.0-4.0	.24	.24			
	10-47	37-60	1.15-1.30	0.06-0.2	0.14-0.21	6.0-8.9	2.0-4.0	.24	.24			
	47-56	37-60	1.15-1.30	0.06-0.2	0.14-0.21	6.0-8.9	2.0-4.0	.24	.24			
	56-60	37-60	1.15-1.30	0.06-0.2	0.14-0.21	6.0-8.9	1.0-2.0	.24	.24			
70:												
Rago	0-4	18-27	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	2.0-4.0	.32	.32	5	6	48
	4-10	18-27	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	2.0-4.0	.32	.32			
	10-24	35-41	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.28	.28			
	24-40	35-41	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.28	.28			
	40-54	15-26	1.15-1.50	0.6-6	0.10-0.20	0.0-2.9	0.5-1.0	.43	.43			
	54-62	15-26	1.15-1.50	0.6-6	0.10-0.20	0.0-2.9	0.5-1.0	.43	.43			
71:												
Rago	0-4	18-27	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-4.0	.37	.37	5	6	48
	4-22	35-41	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.28	.28			
	22-32	27-45	1.15-1.30	0.0000-0.6	0.14-0.21	3.0-5.9	1.0-2.0	.28	.28			
	32-48	27-45	1.15-1.30	0.0000-0.6	0.14-0.21	3.0-5.9	1.0-2.0	.28	.28			
	48-50	27-45	1.15-1.30	0.0000-0.6	0.14-0.21	3.0-5.9	1.0-2.0	.28	.28			
	50-70	15-26	1.15-1.50	0.6-6	0.10-0.20	0.0-2.9	0.5-1.0	.43	.43			
Weld	0-5	19-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	5-12	35-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.24	.24			
	12-18	35-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.24	.24			
	18-28	28-39	1.15-1.30	0.06-0.2	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
	28-60	16-27	1.25-1.30	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.43	.43			
72:												
Richfield	0-5	20-27	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	5-15	35-42	1.15-1.30	0.2-0.6	0.14-0.21	6.0-8.9	1.0-2.0	.32	.32			
	15-23	20-35	1.15-1.30	0.2-2	0.17-0.21	3.0-5.9	0.5-1.0	.32	.32			
	23-37	20-35	1.15-1.30	0.2-2	0.17-0.21	3.0-5.9	0.5-1.0	.32	.32			
	37-60	18-35	1.25-1.30	0.2-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
73:												
Richfield	0-7	27-35	1.15-1.30	0.2-0.6	0.17-0.21	3.0-5.9	1.0-3.0	.28	.28	5	7	38
	7-15	35-42	1.15-1.30	0.2-0.6	0.14-0.21	6.0-8.9	1.0-2.0	.32	.32			
	15-21	20-35	1.15-1.30	0.2-2	0.17-0.21	3.0-5.9	0.5-1.0	.32	.32			
	21-27	18-35	1.25-1.30	0.2-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	27-60	18-35	1.25-1.30	0.2-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
74:												
Richfield	0-5	27-35	1.15-1.30	0.2-0.6	0.17-0.21	3.0-5.9	1.0-3.0	.28	.28	5	7	38
	5-15	35-42	1.15-1.30	0.2-0.6	0.14-0.21	6.0-8.9	1.0-2.0	.32	.32			
	15-24	20-35	1.15-1.30	0.2-2	0.17-0.21	3.0-5.9	0.5-1.0	.32	.32			
	24-27	20-35	1.15-1.30	0.2-2	0.17-0.21	3.0-5.9	0.5-1.0	.32	.32			
	27-49	18-35	1.25-1.30	0.2-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	49-60	18-35	1.25-1.30	0.2-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
75:												
Sampson	0-6	15-25	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-4.0	.24	.24	5	5	56
	6-10	18-35	1.30-1.40	0.6-2	0.17-0.19	3.0-5.9	1.0-3.0	.24	.24			
	10-20	18-35	1.30-1.40	0.6-2	0.17-0.19	3.0-5.9	1.0-3.0	.24	.24			
	20-29	18-35	1.30-1.40	0.6-2	0.17-0.19	3.0-5.9	1.0-3.0	.24	.24			
	29-38	18-35	1.30-1.40	0.6-2	0.17-0.19	3.0-5.9	1.0-3.0	.24	.24			
	38-60	15-30	1.35-1.45	0.6-2	0.13-0.17	0.0-2.9	0.5-2.0	.28	.28			
76:												
Satanta	0-4	18-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	4-7	25-34	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	7-14	25-34	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	14-19	25-34	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	19-23	25-30	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-34	25-30	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	34-60	10-24	1.25-1.50	0.6-2	0.13-0.18	0.0-2.9	0.5-1.0	.32	.32			
77:												
Satanta	0-5	10-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	5-8	10-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28			
	8-16	27-35	1.25-1.40	0.6-2	0.17-0.21	3.0-5.9	0.5-1.0	.24	.24			
	16-21	10-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.37	.37			
	21-28	10-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.37	.37			
	28-60	10-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.37	.37			
Colby	0-3	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	3-12	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	12-28	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	28-60	19-26	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
78:												
Satanta	0-4	18-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	4-7	25-34	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	7-14	25-34	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	14-19	25-34	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	19-23	25-30	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-34	25-30	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	34-60	10-24	1.25-1.50	0.6-2	0.13-0.18	0.0-2.9	0.5-1.0	.32	.32			
Sampson	0-6	15-25	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-4.0	.24	.24	5	5	56
	6-10	18-35	1.30-1.40	0.6-2	0.17-0.19	3.0-5.9	1.0-3.0	.24	.24			
	10-20	18-35	1.30-1.40	0.6-2	0.17-0.19	3.0-5.9	1.0-3.0	.24	.24			
	20-29	18-35	1.30-1.40	0.6-2	0.17-0.19	3.0-5.9	1.0-3.0	.24	.24			
	29-38	18-35	1.30-1.40	0.6-2	0.17-0.19	3.0-5.9	1.0-3.0	.24	.24			
	38-60	15-30	1.35-1.45	0.6-2	0.13-0.17	0.0-2.9	0.5-2.0	.28	.28			
79:												
Satanta	0-4	18-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	4-7	25-34	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	7-14	25-34	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	14-19	25-34	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	1.0-2.0	.20	.20			
	19-23	25-30	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-34	25-30	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	34-60	10-24	1.25-1.50	0.6-2	0.13-0.18	0.0-2.9	0.5-1.0	.32	.32			
Ulmet	0-4	18-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	6	48
	4-7	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	0.5-1.0	.24	.24			
	7-12	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	0.5-1.0	.24	.24			
	12-17	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	0.5-1.0	.24	.24			
	17-26	18-37	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	26-37	18-37	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	37-60	18-37	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
80:												
Stoneham----------	0-3	15-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	3-6	22-31	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	6-10	21-32	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	10-27	21-32	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	27-60	21-32	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
81:												
Stoneham----------	0-3	15-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	3-6	22-31	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	6-10	21-32	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	10-27	21-32	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	27-60	21-32	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
Fort Collins--------	0-5	15-22	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	5-9	15-22	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.28	.28			
	9-19	18-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	19-26	18-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.37	.37			
	26-60	18-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.37	.37			
82:												
Stoneham----------	0-3	15-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	3-6	22-31	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	6-10	21-32	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	10-27	21-32	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
	27-60	21-32	1.25-1.40	0.6-2	0.14-0.21	3.0-5.9	0.5-1.0	.37	.37			
Kimst----------	0-6	21-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37	5	4L	86
	6-12	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
	12-60	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
Fort Collins--------	0-5	15-22	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	5-9	15-22	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-1.0	.28	.28			
	9-19	18-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	19-26	18-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.37	.37			
	26-60	18-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.37	.37			
83:												
Ulmst----------	0-4	18-25	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	5	6	48
	4-7	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	0.5-1.0	.24	.24			
	7-12	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	0.5-1.0	.24	.24			
	12-17	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	0.5-1.0	.24	.24			
	17-26	18-37	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	26-37	18-37	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
	37-60	18-37	1.25-1.40	0.06-2	0.14-0.21	3.0-5.9	0.5-1.0	.24	.24			
84:												
Ulysses----------	0-4	14-27	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	4-10	14-27	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37			
	10-19	21-32	1.15-1.30	0.6-2	0.15-0.21	0.0-2.9	0.5-1.0	.43	.43			
	19-60	18-27	1.25-1.30	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.43	.43			
85:												
Valent----------	0-8	3-7	1.45-1.60	20-20	0.05-0.08	0.0-2.9	0.5-1.0	.17	.17	5	1	220
	8-60	4-9	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-1.0	.20	.20			
86:												
Valent----------	0-4	3-7	1.45-1.60	20-20	0.05-0.08	0.0-2.9	0.5-1.0	.17	.17	5	1	220
	4-7	4-9	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-1.0	.20	.20			
	7-60	4-9	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-1.0	.20	.20			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
87:												
Valent	0-9	5-7	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	9-14	4-9	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-1.0	.20	.20			
	14-60	4-9	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-1.0	.20	.20			
88:												
Valent	0-9	5-7	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	9-14	4-9	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-1.0	.20	.20			
	14-60	4-9	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-1.0	.20	.20			
89:												
Vona	0-5	10-15	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	5-10	10-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	10-15	10-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.28	.28			
	15-25	8-17	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.32	.32			
	25-33	8-17	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.32	.32			
	33-42	8-17	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.32	.32			
	42-61	10-15	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.32	.32			
90:												
Wages	0-5	16-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	5	56
	5-12	25-33	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	1.0-2.0	.24	.24			
	12-17	20-30	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	17-60	10-27	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
91:												
Wages	0-5	16-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	5	56
	5-12	25-33	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	1.0-2.0	.24	.24			
	12-17	20-30	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	17-60	10-27	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
92:												
Wages	0-5	16-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	5	56
	5-12	25-33	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	1.0-2.0	.24	.24			
	12-17	20-30	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	17-60	10-27	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
93:												
Wages	0-5	16-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	5	56
	5-12	25-33	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	1.0-2.0	.24	.24			
	12-17	20-30	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	17-60	10-27	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
Kimst	0-6	21-27	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37	5	4L	86
	6-12	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
	12-60	20-35	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.0-0.5	.28	.28			
94:												
Wages	0-5	16-24	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	1.0-3.0	.28	.28	5	5	56
	5-12	25-33	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	1.0-2.0	.24	.24			
	12-17	20-30	1.25-1.40	0.6-2	0.14-0.21	0.0-2.9	0.5-1.0	.24	.24			
	17-60	10-27	1.25-1.50	0.6-6	0.10-0.18	0.0-2.9	0.5-1.0	.28	.28			
Weld	0-5	19-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	5-12	35-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.24	.24			
	12-18	35-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.24	.24			
	18-28	28-39	1.15-1.30	0.06-0.2	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
	28-60	16-27	1.25-1.30	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.43	.43			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
95:												
Weld	0-5	19-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	5-12	35-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.24	.24			
	12-18	35-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.24	.24			
	18-28	28-39	1.15-1.30	0.06-0.2	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
	28-60	16-27	1.25-1.30	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.43	.43			
96:												
Weld	0-5	19-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	5-12	35-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.24	.24			
	12-18	35-45	1.15-1.30	0.06-0.2	0.14-0.21	3.0-5.9	1.0-2.0	.24	.24			
	18-28	28-39	1.15-1.30	0.06-0.2	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
	28-60	16-27	1.25-1.30	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.43	.43			
Norka	0-5	18-25	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	5-13	25-34	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	1.0-2.0	.37	.37			
	13-28	22-32	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	28-39	22-32	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	39-49	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
	49-67	18-26	1.25-1.30	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43			
97:												
Wiley	0-4	15-27	1.15-1.30	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.37	.37	5	4L	86
	4-10	18-35	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	10-18	18-35	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	18-23	18-35	1.15-1.30	0.6-2	0.15-0.21	3.0-5.9	0.5-1.0	.43	.43			
	23-60	15-27	1.15-1.30	0.6-6	0.15-0.20	0.0-2.9	0.0-0.5	.49	.49			
98:												
Water.												

Table 17.--Chemical Properties of the Soils

(Absence of an entry indicates that the data were not estimated)

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
1:							
Ascalon	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-10	10-20	6.6-7.8	0	0	0	0
	10-21	10-20	6.6-7.8	0	0	0	0
	21-37	10-20	7.9-8.4	5-10	0	0	0
	37-50	10-20	7.9-8.4	5-10	0	0	0
	50-60	2.0-10	7.9-8.4	5-10	0	0	0
2:							
Ascalon	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-10	10-20	6.6-7.8	0	0	0	0
	10-21	10-20	6.6-7.8	0	0	0	0
	21-37	10-20	7.9-8.4	5-10	0	0	0
	37-50	10-20	7.9-8.4	5-10	0	0	0
	50-60	2.0-10	7.9-8.4	5-10	0	0	0
3:							
Ascalon	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-10	10-20	6.6-7.8	0	0	0	0
	10-21	10-20	6.6-7.8	0	0	0	0
	21-37	10-20	7.9-8.4	5-10	0	0	0
	37-50	10-20	7.9-8.4	5-10	0	0	0
	50-60	2.0-10	7.9-8.4	5-10	0	0	0
4:							
Ascalon	0-4	4.0-15	6.6-7.8	0	0	0	0
	4-7	4.0-15	6.6-7.8	0	0	0	0
	7-14	5.0-25	6.6-7.8	0-5	0	0	0
	14-18	5.0-25	6.6-7.8	0-5	0	0	0
	18-25	5.0-20	7.9-8.4	0-5	0	0.0-2.0	0
	25-60	5.0-20	7.9-9.0	0-10	0	0.0-2.0	0
5:							
Ascalon	0-4	10-20	6.6-7.8	0	0	0	0
	4-7	10-20	6.6-7.8	0	0	0	0
	7-12	10-20	6.6-7.8	0	0	0	0
	12-22	10-20	6.6-7.8	0	0	0	0
	22-41	10-20	7.9-8.4	5-10	0	0	0
	41-60	2.0-10	7.9-8.4	5-10	0	0	0
6:							
Ascalon	0-4	10-20	6.6-7.8	0	0	0	0
	4-7	10-20	6.6-7.8	0	0	0	0
	7-12	10-20	6.6-7.8	0	0	0	0
	12-22	10-20	6.6-7.8	0	0	0	0
	22-41	10-20	7.9-8.4	5-10	0	0	0
	41-60	2.0-10	7.9-8.4	5-10	0	0	0
7:							
Ascalon	0-4	10-20	6.6-7.8	0	0	0	0
	4-7	10-20	6.6-7.8	0	0	0	0
	7-12	10-20	6.6-7.8	0	0	0	0
	12-22	10-20	6.6-7.8	0	0	0	0
	22-41	10-20	7.9-8.4	5-10	0	0	0
	41-60	2.0-10	7.9-8.4	5-10	0	0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
8:							
Ascalon	0-3	10-20	6.6-7.8	0	0	0	0
	3-10	10-20	6.6-7.8	0	0	0	0
	10-15	10-20	6.6-7.8	0	0	0	0
	15-24	10-20	6.6-7.8	0	0	0	0
	24-31	2.0-10	7.9-8.4	5-10	0	0	0
	31-60	2.0-10	7.9-8.4	5-10	0	0	0
Eckley	0-4	10-20	6.6-7.8	0	0	0	0
	4-12	10-25	6.6-7.8	0	0	0	0
	12-15	5.0-15	6.6-7.8	0	0	0	0
	15-22	1.0-5.0	6.6-7.8	0-5	0	0	0
	22-60	1.0-5.0	6.6-7.8	0-5	0	0	0
9:							
Ascalon	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-10	10-20	6.6-7.8	0	0	0	0
	10-21	10-20	6.6-7.8	0	0	0	0
	21-37	10-20	7.9-8.4	5-10	0	0	0
	37-50	10-20	7.9-8.4	5-10	0	0	0
	50-60	2.0-10	7.9-8.4	5-10	0	0	0
Haxtun	0-9	5.0-20	6.6-7.3	0	0	0	0
	9-24	10-25	6.6-7.8	0	0	0	0
	24-30	10-25	7.4-8.4	0-10	0	0.0-2.0	0
	30-40	10-25	7.4-8.4	0-10	0	0.0-2.0	0
	40-48	10-25	7.4-8.4	0-10	0	0.0-2.0	0
	48-58	2.0-15	7.4-8.4	5-15	0	0.0-2.0	0-5
	58-72	2.0-15	7.4-8.4	5-15	0	0.0-2.0	0-5
10:							
Bayard	0-5	5.0-15	6.6-7.8	0-5	0	0	0
	5-15	5.0-15	6.6-7.8	0-5	0	0	0
	15-21	4.0-10	7.9-8.4	5-15	0	0	0
	21-36	4.0-10	7.9-8.4	5-15	0	0	0
	36-60	2.0-10	7.9-8.4	5-15	0	0	0
11:							
Beckton	0-2	10-20	7.4-8.4	0-5	0	0.0-8.0	0-5
	2-4	15-25	7.9-8.4	0-5	0	0.0-8.0	5-13
	4-8	15-25	9.1-9.6	5-10	0-1	4.0-16.0	13-30
	8-17	15-25	9.1-9.6	5-10	0-1	4.0-16.0	13-30
	17-24	15-25	9.1-9.6	5-10	0-1	4.0-16.0	13-30
	24-60	10-20	9.1-9.6	5-10	0-1	4.0-16.0	13-30
12:							
Bethune	0-4	20-35	7.4-7.8	0-5	0	0	0
	4-11	25-40	7.4-7.8	0-5	0	0	0
	11-17	20-35	7.9-8.4	20-30	0	0	0
	17-25	10-20	7.9-9.0	30-40	0	0	0
	25-29	---	---	---	---	---	---
13:							
Canyon	0-3	5.0-15	7.4-8.4	0-10	0	0.0-2.0	0
	3-7	5.0-15	7.9-8.4	1-10	0	0.0-2.0	0
	7-10	5.0-15	7.9-8.4	1-10	0	0.0-2.0	0
	10-14	---	---	---	---	---	---

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
14:							
Canyon	0-3	5.0-15	7.4-8.4	0-10	0	0.0-2.0	0
	3-7	5.0-15	7.9-8.4	1-10	0	0.0-2.0	0
	7-10	5.0-15	7.9-8.4	1-10	0	0.0-2.0	0
	10-14	---	---	---	---	---	---
Rock outcrop.							
15:							
Colby	0-4	10-20	7.9-8.4	5-10	0	0	0
	4-60	5.0-15	7.9-8.4	5-10	0	0	0
16:							
Colby	0-6	10-20	7.9-8.4	5-10	0	0	0
	6-12	10-20	7.9-8.4	5-10	0	0	0
	12-30	5.0-15	7.9-8.4	5-10	0	0	0
	30-60	5.0-15	7.9-8.4	5-10	0	0	0
17:							
Colby	0-3	10-20	7.9-8.4	5-10	0	0	0
	3-8	10-20	7.9-8.4	5-10	0	0	0
	8-30	5.0-15	7.9-8.4	5-10	0	0	0
	30-60	5.0-15	7.9-8.4	5-10	0	0	0
18:							
Colby	0-5	10-20	7.9-8.4	5-10	0	0	0
	5-16	5.0-15	7.9-8.4	5-10	0	0	0
	16-32	5.0-15	7.9-8.4	5-10	0	0	0
	32-60	5.0-15	7.9-8.4	5-10	0	0	0
19:							
Colby	0-5	10-25	7.9-8.4	5-10	0	0	0
	5-19	5.0-15	7.9-8.4	5-10	0	0	0
	19-42	5.0-15	7.9-8.4	5-10	0	0	0
	42-62	5.0-15	7.9-8.4	5-10	0	0	0
20:							
Colby	0-4	10-20	7.9-8.4	5-10	0	0	0
	4-33	5.0-15	7.9-8.4	5-10	0	0	0
	33-60	5.0-15	7.9-8.4	5-10	0	0	0
Aridic Ustorthents	0-4	5.0-15	7.9-8.4	5-10	0	0	0
	4-8	5.0-10	7.9-8.4	5-10	0	0	0
	8-17	5.0-10	7.9-8.4	5-10	0	0	0
	17-35	5.0-10	7.9-8.4	5-10	0	0	0
	35-63	5.0-10	7.9-8.4	5-10	0	0	0
21:							
Concordia	0-2	5.0-20	7.4-8.4	0-5	0	0.4-2.0	5-15
	2-6	20-40	8.5-9.6	5-15	0-5	0.9-6.0	20-70
	6-13	20-40	8.5-9.6	5-15	0-5	0.9-6.0	20-70
	13-24	20-40	8.5-9.6	5-15	0-5	0.9-6.0	20-70
	24-38	20-40	8.5-9.6	5-15	0-5	0.9-6.0	20-70
	38-47	10-25	7.9-9.0	5-10	0-5	0.4-2.0	5-15
	47-56	10-25	7.9-9.0	5-10	0-5	0.4-2.0	5-15
	56-80	10-25	7.9-9.0	5-10	0-5	0.4-2.0	5-15

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
22:							
Eckley	0-4	5.0-15	6.6-7.8	0	0	0	0
	4-12	10-25	6.6-7.8	0	0	0	0
	12-15	5.0-15	6.6-7.8	0	0	0	0
	15-22	1.0-5.0	6.6-7.8	0-5	0	0	0
	22-60	1.0-5.0	6.6-7.8	0-5	0	0	0
Wages	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	10-25	7.4-7.8	0	0	0	0
	12-17	10-20	7.9-8.4	5-15	0	0	0
	17-60	4.0-20	7.9-8.4	5-15	0	0	0
23:							
Fort Collins	0-5	10-15	6.6-7.8	0	0	0	0
	5-9	10-15	6.6-7.8	0	0	0	0
	9-19	10-25	6.6-7.8	0	0	0	0
	19-26	5.0-20	7.9-9.0	5-15	0	0.0-2.0	0
	26-60	5.0-20	7.9-9.0	5-15	0	0.0-2.0	0
24:							
Glenberg	0-5	5.0-15	7.4-8.4	0-5	0	0	0
	5-9	4.0-15	7.4-8.4	1-10	0	0	0
	9-17	4.0-15	7.4-8.4	1-10	0	0	0
	17-28	4.0-15	7.4-8.4	1-10	0	0	0
	28-32	4.0-15	7.4-8.4	1-10	0	0	0
	32-60	3.0-15	7.4-9.0	1-10	0	0.0-2.0	0
25:							
Glenberg	0-4	5.0-15	7.4-8.4	0-5	0	0	0
	4-13	4.0-15	7.4-8.4	1-10	0	0	0
	13-21	3.0-15	7.4-9.0	1-10	0	0.0-2.0	0
	21-60	3.0-15	7.4-9.0	1-10	0	0.0-2.0	0
Bankard	0-4	2.0-10	7.4-8.4	0-5	0	0	0
	4-60	1.0-10	7.4-8.4	0-5	0	0	0
26:							
Goshen	0-4	10-25	6.6-7.8	0	0	0	0
	4-19	10-25	6.6-7.8	0	0	0	0
	19-32	10-25	6.6-7.8	0	0	0	0
	32-45	10-25	6.6-7.8	0	0	0	0
	45-52	10-25	6.6-7.8	0	0	0	0
	52-60	10-20	7.4-8.4	1-5	0	0	0
27:							
Haverson	0-5	5.0-20	7.4-8.4	0-5	0	0.0-8.0	0
	5-14	5.0-20	7.4-8.4	0-5	0	0.0-8.0	0
	14-60	5.0-20	7.4-9.0	1-15	0-1	0.0-8.0	0
28:							
Haxtun	0-6	3.0-10	6.6-7.3	0	0	0	0
	6-13	10-25	6.6-7.8	0	0	0	0
	13-18	10-25	6.6-7.8	0	0	0	0
	18-26	10-25	6.6-7.8	0	0	0	0
	26-39	10-25	6.6-7.8	0	0	0	0
	39-43	10-25	6.6-7.8	0	0	0	0
	43-52	2.0-15	7.4-8.4	5-15	0	0.0-2.0	0-5
	52-61	2.0-15	7.4-8.4	5-15	0	0.0-2.0	0-5

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
29:							
Iliff	0-6	10-20	6.6-7.8	0	0	0	0
	6-9	10-20	6.6-7.8	0	0	0	0
	9-15	25-45	6.6-7.8	0	0	0	0
	15-20	15-35	7.4-8.4	5-15	0	0	0
	20-25	15-35	7.4-8.4	5-15	0	0	0
	25-31	15-25	7.9-8.4	5-15	0	0	0
	31-36	15-25	7.9-8.4	5-15	0	0	0
	36-40	---	---	---	---	---	---
30:							
Julesburg	0-8	3.0-10	6.6-7.8	0	0	0	0
	8-14	5.0-15	6.6-7.8	0	0	0	0
	14-34	5.0-15	6.6-7.8	0	0	0	0
	34-42	5.0-15	6.6-7.8	0	0	0	0
	42-62	0.0-10	6.6-7.8	0-5	0	0	0
31:							
Julesburg	0-8	3.0-10	6.6-7.8	0	0	0	0
	8-14	5.0-15	6.6-7.8	0	0	0	0
	14-34	5.0-15	6.6-7.8	0	0	0	0
	34-42	5.0-15	6.6-7.8	0	0	0	0
	42-62	0.0-10	6.6-7.8	0-5	0	0	0
32:							
Julesburg	0-5	5.0-10	6.6-7.8	0	0	0	0
	5-12	5.0-15	6.6-7.8	0	0	0	0
	12-30	5.0-15	6.6-7.8	0	0	0	0
	30-42	5.0-15	6.6-7.8	0	0	0	0
	42-60	0.0-10	6.6-7.8	0-5	0	0	0
33:							
Julesburg	0-5	5.0-10	6.6-7.8	0	0	0	0
	5-12	5.0-15	6.6-7.8	0	0	0	0
	12-30	5.0-15	6.6-7.8	0	0	0	0
	30-42	5.0-15	6.6-7.8	0	0	0	0
	42-60	0.0-10	6.6-7.8	0-5	0	0	0
34:							
Julesburg	0-5	5.0-10	6.6-7.8	0	0	0	0
	5-12	5.0-15	6.6-7.8	0	0	0	0
	12-30	5.0-15	6.6-7.8	0	0	0	0
	30-42	5.0-15	6.6-7.8	0	0	0	0
	42-60	0.0-10	6.6-7.8	0-5	0	0	0
Otero	0-6	4.0-10	7.4-8.4	0-5	0	0	0
	6-60	4.0-10	7.9-8.4	1-5	0	0	0
35:							
Keith	0-6	10-20	6.6-7.8	0	0	0	0
	6-14	10-25	6.6-7.8	0	0	0	0
	14-20	10-25	6.6-7.8	0	0	0	0
	20-37	5.0-20	7.9-8.4	3-15	0	0	0
	37-60	5.0-20	7.9-8.4	3-15	0	0	0
36:							
Kimst	0-6	10-20	7.4-8.4	5-10	0	0	0
	6-12	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
	12-60	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
37:							
Kimst	0-5	10-20	7.4-8.4	5-10	0	0	0
	5-22	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
	22-60	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
38:							
Kimst	0-4	10-20	7.4-8.4	5-10	0	0	0
	4-7	10-20	7.4-8.4	5-10	0	0	0
	7-30	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
	30-60	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
Canyon	0-3	5.0-15	7.4-8.4	1-10	0	0.0-2.0	0
	3-7	5.0-15	7.4-8.4	1-10	0	0.0-2.0	0
	7-13	5.0-15	7.4-8.4	1-10	0	0.0-2.0	0
	13-17	---	---	---	---	---	---
39:							
Kimst	0-4	10-20	7.4-8.4	5-10	0	0	0
	4-12	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
	12-20	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
	20-41	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
	41-60	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
Richfield	0-5	15-25	6.6-7.8	0	0	0	0
	5-15	20-40	6.6-7.8	0	0	0	0
	15-24	10-20	7.9-8.4	5-15	0	0	0
	24-27	10-20	7.9-8.4	5-15	0	0	0
	27-49	5.0-20	7.9-9.0	5-15	0	0	0
	49-60	5.0-20	7.9-9.0	5-15	0	0	0
40:							
Kimst	0-5	10-20	7.4-8.4	5-10	0	0	0
	5-12	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
	12-60	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
Wages	0-4	10-20	7.4-7.8	0	0	0	0
	4-8	10-25	7.4-7.8	0	0	0	0
	8-13	10-20	7.9-8.4	5-15	0	0	0
	13-20	4.0-20	7.9-8.4	5-15	0	0	0
	20-60	4.0-20	7.9-8.4	5-15	0	0	0
41:							
Kitcarson	0-6	5.0-15	7.9-8.4	5-10	0	0.0-4.0	0
	6-15	5.0-15	7.9-8.4	5-10	0	0.0-4.0	0
	15-22	5.0-10	7.9-8.4	5-15	0	0.0-4.0	0
	22-28	5.0-10	7.9-8.4	5-15	0	0.0-4.0	0
	28-34	10-20	7.9-8.4	5-15	0	0.0-4.0	0
	34-60	2.0-10	7.9-8.4	5-10	0	0.0-4.0	0
42:							
Kuma	0-6	10-15	6.6-7.8	0	0	0	0
	6-15	10-25	6.6-7.8	0	0	0	0
	15-23	10-25	6.6-7.8	0	0	0	0
	23-29	10-25	7.9-8.4	1-10	0	0	0
	29-36	5.0-15	7.9-9.0	1-10	0	0	0
	36-60	5.0-15	7.9-9.0	1-10	0	0	0
Keith	0-9	10-15	6.6-7.8	0	0	0	0
	9-18	10-25	6.6-7.8	0	0	0	0
	18-32	5.0-20	7.9-8.4	3-15	0	0	0
	32-50	5.0-20	7.9-8.4	3-15	0	0	0
	50-60	5.0-20	7.9-8.4	3-15	0	0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
43:							
Kuma	0-5	10-25	6.6-7.8	0	0	0	0
	5-9	10-25	6.6-7.8	0	0	0	0
	9-16	10-25	6.6-7.8	0	0	0	0
	16-19	10-25	6.6-7.8	0	0	0	0
	19-24	10-25	7.9-8.4	1-10	0	0	0
	24-34	10-25	7.9-8.4	1-10	0	0	0
	34-43	5.0-15	7.9-9.0	1-10	0	0	0
	43-56	5.0-15	7.9-9.0	1-10	0	0	0
	56-61	5.0-15	7.9-9.0	1-10	0	0	0
Keith	0-6	10-20	6.6-7.8	0	0	0	0
	6-9	10-25	6.6-7.8	0	0	0	0
	9-17	10-25	6.6-7.8	0	0	0	0
	17-24	10-20	7.9-8.4	3-15	0	0	0
	24-34	5.0-20	7.9-8.4	3-15	0	0	0
	34-41	5.0-20	7.9-8.4	3-15	0	0	0
	41-47	5.0-20	7.9-8.4	3-15	0	0	0
	47-60	5.0-20	7.9-8.4	3-15	0	0	0
44:							
Manter	0-6	4.0-10	6.6-7.8	0	0	0	0
	6-9	5.0-15	6.6-7.8	0	0	0	0
	9-22	5.0-15	6.6-7.8	0	0	0	0
	22-40	5.0-15	6.6-7.8	0-5	0	0	0
	40-60	1.0-10	7.9-8.4	5-15	0	0.0-2.0	0
45:							
Manter	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-9	5.0-15	6.6-7.8	0	0	0	0
	9-22	5.0-15	6.6-7.8	0	0	0	0
	22-40	5.0-15	6.6-7.8	0-5	0	0	0
	40-60	1.0-10	7.9-8.4	5-15	0	0.0-2.0	0
46:							
Manter	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-9	5.0-15	6.6-7.8	0	0	0	0
	9-22	5.0-15	6.6-7.8	0	0	0	0
	22-40	5.0-15	6.6-7.8	0-5	0	0	0
	40-60	1.0-10	7.9-8.4	5-15	0	0.0-2.0	0
47:							
Manter	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-9	5.0-15	6.6-7.8	0	0	0	0
	9-22	5.0-15	6.6-7.8	0	0	0	0
	22-40	5.0-15	6.6-7.8	0-5	0	0	0
	40-60	1.0-10	7.9-8.4	5-15	0	0.0-2.0	0
48:							
Manter	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-9	5.0-15	6.6-7.8	0	0	0	0
	9-22	5.0-15	6.6-7.8	0	0	0	0
	22-40	5.0-15	6.6-7.8	0-5	0	0	0
	40-60	1.0-10	7.9-8.4	5-15	0	0.0-2.0	0
Ascalon	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-10	10-20	6.6-7.8	0	0	0	0
	10-21	10-20	6.6-7.8	0	0	0	0
	21-37	10-20	7.9-8.4	5-10	0	0	0
	37-50	10-20	7.9-8.4	5-10	0	0	0
	50-60	2.0-10	7.9-8.4	5-10	0	0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
49:							
Manter	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-9	5.0-15	6.6-7.8	0	0	0	0
	9-22	5.0-15	6.6-7.8	0	0	0	0
	22-40	5.0-15	6.6-7.8	0-5	0	0	0
	40-60	1.0-10	7.9-8.4	5-15	0	0.0-2.0	0
Otero	0-6	4.0-10	7.4-8.4	0-5	0	0	0
	6-60	4.0-10	7.9-8.4	1-5	0	0	0
50:							
Manzanst	0-3	10-25	7.4-8.4	0-10	0	0.0-4.0	0-10
	3-12	20-40	7.4-8.4	5-10	0-1	0.0-4.0	1-10
	12-37	20-40	7.4-8.4	5-10	0-1	0.0-4.0	1-10
	37-52	15-35	7.9-9.0	5-15	0-5	0.0-2.0	1-10
	52-60	15-35	7.9-9.0	5-15	0-5	0.0-2.0	1-10
51:							
Midway	0-4	20-35	6.6-8.4	0-5	0-1	2.0-4.0	0
	4-15	20-30	7.9-9.0	5-15	1-15	2.0-8.0	1-15
	15-19	---	---	---	---	---	---
Razor	0-4	15-35	6.6-8.4	0-5	0	0.0-2.0	0-10
	4-10	20-50	7.4-8.4	0-10	0	0.0-2.0	0-10
	10-25	20-50	7.4-8.4	1-15	0-5	8.0-16.0	10-15
	25-29	---	---	---	---	---	---
52:							
Norka	0-5	10-20	6.6-7.8	0	0	0	0
	5-13	10-25	6.6-7.8	0	0	0	0
	13-28	10-20	7.9-8.4	5-15	0	0	0
	28-39	10-20	7.9-8.4	5-15	0	0	0
	39-49	5.0-15	7.9-8.4	5-15	0	0	0
	49-67	5.0-15	7.9-8.4	5-15	0	0	0
53:							
Norka	0-5	10-20	6.6-7.8	0	0	0	0
	5-13	10-25	6.6-7.8	0	0	0	0
	13-28	10-20	7.9-8.4	5-15	0	0	0
	28-39	10-20	7.9-8.4	5-15	0	0	0
	39-49	5.0-15	7.9-8.4	5-15	0	0	0
	49-67	5.0-15	7.9-8.4	5-15	0	0	0
54:							
Norka	0-5	10-20	6.6-7.8	0	0	0	0
	5-13	10-25	6.6-7.8	0	0	0	0
	13-28	10-20	7.9-8.4	5-15	0	0	0
	28-39	10-20	7.9-8.4	5-15	0	0	0
	39-49	5.0-15	7.9-8.4	5-15	0	0	0
	49-67	5.0-15	7.9-8.4	5-15	0	0	0
Colby	0-4	10-20	7.9-8.4	5-10	0	0	0
	4-60	5.0-15	7.9-8.4	5-10	0	0	0
55:							
Norka	0-3	10-20	6.6-7.8	0	0	0	0
	3-10	10-25	6.6-7.8	0	0	0	0
	10-15	5.0-15	7.9-8.4	5-15	0	0	0
	15-60	5.0-15	7.9-8.4	5-15	0	0	0
Colby	0-4	10-20	7.9-8.4	5-10	0	0	0
	4-60	5.0-15	7.9-8.4	5-10	0	0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
56:							
Norka	0-7	10-20	6.6-7.8	0	0	0	0
	7-14	10-25	6.6-7.8	0	0	0	0
	14-18	5.0-15	7.9-8.4	5-15	0	0	0
	18-60	5.0-15	7.9-8.4	5-15	0	0	0
Colby	0-3	10-20	7.9-8.4	5-10	0	0	0
	3-8	10-20	7.9-8.4	5-10	0	0	0
	8-30	5.0-15	7.9-8.4	5-10	0	0	0
	30-60	5.0-15	7.9-8.4	5-10	0	0	0
57:							
Norka	0-3	10-20	6.6-7.8	0	0	0	0
	3-10	10-25	6.6-7.8	0	0	0	0
	10-15	5.0-15	7.9-8.4	5-15	0	0	0
	15-60	5.0-15	7.9-8.4	5-15	0	0	0
Colby	0-4	10-20	7.9-8.4	5-10	0	0	0
	4-60	5.0-15	7.9-8.4	5-10	0	0	0
Weld	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	25-40	6.6-7.8	0	0	0	0
	12-18	25-40	6.6-7.8	0	0	0	0
	18-28	15-30	7.9-8.4	5-15	0	0	0
	28-60	10-25	7.9-9.0	5-15	0	0	0
58:							
Nunn	0-8	15-25	6.6-7.8	0	0	0	0
	8-15	15-30	7.4-7.8	0	0	0.0-2.0	0
	15-17	15-30	7.4-7.8	0	0	0.0-2.0	0
	17-26	15-35	7.9-8.4	4-15	0	0.0-2.0	0
	26-44	15-35	7.9-8.4	4-15	0	0.0-2.0	0
	44-60	15-35	7.9-8.4	4-15	0	0.0-2.0	0
59:							
Nunn	0-5	15-25	6.6-7.8	0	0	0	0
	5-11	15-30	7.4-7.8	0	0	0.0-2.0	0
	11-17	15-35	7.9-8.4	4-15	0	0.0-2.0	0
	17-23	15-35	7.9-8.4	4-15	0	0.0-2.0	0
	23-50	5.0-20	7.9-9.0	4-15	0	0.0-2.0	0
	50-60	5.0-20	7.9-9.0	4-15	0	0.0-2.0	0
60:							
Olnest	0-4	5.0-15	6.6-7.8	0	0	0	0
	4-7	5.0-15	6.6-7.8	0	0	0	0
	7-16	10-20	6.6-7.8	0	0	0	0
	16-22	5.0-15	7.9-9.0	4-15	0	0	0
	22-35	5.0-15	7.9-9.0	4-15	0	0	0
	35-49	5.0-15	7.9-9.0	4-15	0	0	0
	49-60	5.0-15	7.9-9.0	4-15	0	0	0
61:							
Olnest	0-4	5.0-15	6.6-7.8	0	0	0	0
	4-7	5.0-15	6.6-7.8	0	0	0	0
	7-16	10-20	6.6-7.8	0	0	0	0
	16-22	5.0-15	7.9-9.0	4-15	0	0	0
	22-35	5.0-15	7.9-9.0	4-15	0	0	0
	35-49	5.0-15	7.9-9.0	4-15	0	0	0
	49-60	5.0-15	7.9-9.0	4-15	0	0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
62:							
Olnest	0-4	10-20	6.6-7.8	0	0	0	0
	4-11	10-20	6.6-7.8	0	0	0	0
	11-18	10-20	6.6-7.8	0	0	0	0
	18-23	10-20	6.6-7.8	0	0	0	0
	23-42	5.0-15	7.9-9.0	4-15	0	0	0
	42-55	5.0-15	7.9-9.0	4-15	0	0	0
	55-60	5.0-15	7.9-9.0	4-15	0	0	0
Ascalon	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-10	10-20	6.6-7.8	0	0	0	0
	10-21	10-20	6.6-7.8	0	0	0	0
	21-37	10-20	7.9-8.4	5-10	0	0	0
	37-50	10-20	7.9-8.4	5-10	0	0	0
	50-60	2.0-10	7.9-8.4	5-10	0	0	0
63:							
Otero	0-6	4.0-10	7.4-8.4	0-5	0	0	0
	6-60	4.0-10	7.9-8.4	1-5	0	0	0
64:							
Otero	0-5	4.0-15	7.9-8.4	0-5	0	0	0
	5-18	4.0-10	7.9-8.4	1-5	0	0	0
	18-39	4.0-10	7.9-8.4	1-5	0	0	0
	39-60	4.0-10	7.9-8.4	1-5	0	0	0
Olnest	0-4	5.0-15	6.6-7.8	0	0	0	0
	4-7	5.0-15	6.6-7.8	0	0	0	0
	7-16	10-20	6.6-7.8	0	0	0	0
	16-22	5.0-15	7.9-9.0	4-15	0	0	0
	22-35	5.0-15	7.9-9.0	4-15	0	0	0
	35-49	5.0-15	7.9-9.0	4-15	0	0	0
	49-60	5.0-15	7.9-9.0	4-15	0	0	0
65:							
Oxyaquic Ustifluvents	0-7	5.0-15	7.4-8.4	0-5	0	0	0
	7-11	2.0-10	7.4-8.4	5-10	0	0	0
	11-30	2.0-10	7.4-8.4	5-10	0	0	0
	30-35	2.0-10	7.4-8.4	5-10	0	0	0
	35-44	10-25	7.4-8.4	5-10	0	0	0
	44-56	10-25	7.4-8.4	5-10	0	0	0
	56-60	10-25	7.4-8.4	5-10	0	0	0
	60-62	1.0-5.0	7.9-8.4	5-10	0	0	0
66:							
Paoli	0-6	5.0-15	6.6-7.8	0	0	0	0
	6-14	5.0-15	6.6-7.8	0	0	0	0
	14-28	5.0-15	6.6-7.8	0	0	0	0
	28-34	5.0-15	6.6-7.8	0	0	0	0
	34-44	5.0-15	7.9-8.4	4-10	0	0	0
	44-55	5.0-15	7.9-8.4	4-10	0	0	0
	55-60	5.0-15	7.9-8.4	4-10	0	0	0
67:							
Pits, gravel	0-6	---	---	---	---	0	---
	6-60	---	---	---	---	0	---

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
68:							
Platner	0-6	10-20	6.6-7.8	0	0	0	0
	6-11	15-30	7.4-7.8	0	0	0	0
	11-20	15-30	7.4-7.8	0	0	0	0
	20-27	10-20	7.9-8.4	5-15	0	0	0
	27-37	5.0-15	7.9-9.0	5-10	0	0	0
	37-60	5.0-15	7.9-9.0	5-10	0	0	0
69:							
Pleasant	0-5	20-30	6.6-7.8	0	0	0	0
	5-10	25-55	7.4-7.8	0	0	0	0
	10-47	25-55	7.4-7.8	0	0	0	0
	47-56	25-55	7.4-7.8	0	0	0	0
	56-60	25-55	7.4-7.8	0	0	0	0
70:							
Rago	0-4	10-20	6.6-7.8	0	0	0	0
	4-10	10-20	6.6-7.8	0	0	0	0
	10-24	15-30	6.6-7.8	0	0	0	0
	24-40	15-30	6.6-7.8	0	0	0	0
	40-54	5.0-15	7.9-8.4	5-15	0	0.0-2.0	0
	54-62	5.0-15	7.9-8.4	5-15	0	0.0-2.0	0
71:							
Rago	0-4	10-25	6.6-7.8	0	0	0	0
	4-22	25-35	6.6-7.8	0	0	0	0
	22-32	15-40	7.9-8.4	5-10	0	0.0-2.0	0
	32-48	15-40	7.9-8.4	5-10	0	0.0-2.0	0
	48-50	15-40	7.9-8.4	5-10	0	0.0-2.0	0
	50-70	5.0-15	7.9-8.4	5-15	0	0.0-2.0	0
Weld	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	25-40	6.6-7.8	0	0	0	0
	12-18	25-40	6.6-7.8	0	0	0	0
	18-28	15-30	7.9-8.4	5-15	0	0	0
	28-60	10-25	7.9-9.0	5-15	0	0	0
72:							
Richfield	0-5	10-20	6.6-7.8	0	0	0	0
	5-15	20-40	6.6-7.8	0	0	0	0
	15-23	10-20	7.9-8.4	5-15	0	0	0
	23-37	10-20	7.9-8.4	5-15	0	0	0
	37-60	5.0-20	7.9-9.0	5-15	0	0	0
73:							
Richfield	0-7	15-25	6.6-7.8	0	0	0	0
	7-15	20-40	6.6-7.8	0	0	0	0
	15-21	10-20	7.9-8.4	5-15	0	0	0
	21-27	5.0-20	7.9-9.0	5-15	0	0	0
	27-60	5.0-20	7.9-9.0	5-15	0	0	0
74:							
Richfield	0-5	15-25	6.6-7.8	0	0	0	0
	5-15	20-40	6.6-7.8	0	0	0	0
	15-24	10-20	7.9-8.4	5-15	0	0	0
	24-27	10-20	7.9-8.4	5-15	0	0	0
	27-49	5.0-20	7.9-9.0	5-15	0	0	0
	49-60	5.0-20	7.9-9.0	5-15	0	0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
75:							
Sampson	0-6	10-25	6.6-7.8	0	0	0	0
	6-10	10-25	6.6-7.8	0	0	0	0
	10-20	10-25	6.6-7.8	0	0	0	0
	20-29	10-25	6.6-7.8	0	0	0	0
	29-38	10-25	6.6-7.8	0	0	0	0
	38-60	10-20	7.9-8.4	3-15	0	0.0-2.0	0
76:							
Satanta	0-4	10-20	6.6-7.8	0	0	0	0
	4-7	10-25	6.6-7.8	0	0	0	0
	7-14	10-25	6.6-7.8	0	0	0	0
	14-19	10-25	6.6-7.8	0	0	0	0
	19-23	10-20	7.9-8.4	3-15	0	0	0
	23-34	10-20	7.9-8.4	3-15	0	0	0
	34-60	4.0-15	7.9-8.4	4-15	0	0	0
77:							
Satanta	0-5	5.0-20	6.1-7.8	0	0	0	0
	5-8	5.0-20	6.1-7.8	0	0	0	0
	8-16	10-25	6.1-7.8	0	0	0	0
	16-21	5.0-20	7.4-8.4	0-10	0	0	0
	21-28	5.0-20	7.4-8.4	0-10	0	0	0
	28-60	5.0-20	7.4-8.4	0-10	0	0	0
Colby	0-3	10-20	7.9-8.4	5-10	0	0	0
	3-12	5.0-15	7.9-8.4	5-10	0	0	0
	12-28	5.0-15	7.9-8.4	5-10	0	0	0
	28-60	5.0-15	7.9-8.4	5-10	0	0	0
78:							
Satanta	0-4	10-20	6.6-7.8	0	0	0	0
	4-7	10-25	6.6-7.8	0	0	0	0
	7-14	10-25	6.6-7.8	0	0	0	0
	14-19	10-25	6.6-7.8	0	0	0	0
	19-23	10-20	7.9-8.4	3-15	0	0	0
	23-34	10-20	7.9-8.4	3-15	0	0	0
	34-60	4.0-15	7.9-8.4	4-15	0	0	0
Sampson	0-6	10-25	6.6-7.8	0	0	0	0
	6-10	10-25	6.6-7.8	0	0	0	0
	10-20	10-25	6.6-7.8	0	0	0	0
	20-29	10-25	6.6-7.8	0	0	0	0
	29-38	10-25	6.6-7.8	0	0	0	0
	38-60	10-20	7.9-8.4	3-15	0	0.0-2.0	0
79:							
Satanta	0-4	10-20	6.6-7.8	0	0	0	0
	4-7	10-25	6.6-7.8	0	0	0	0
	7-14	10-25	6.6-7.8	0	0	0	0
	14-19	10-25	6.6-7.8	0	0	0	0
	19-23	10-20	7.9-8.4	3-15	0	0	0
	23-34	10-20	7.9-8.4	3-15	0	0	0
	34-60	4.0-15	7.9-8.4	4-15	0	0	0
Ulmet	0-4	10-20	6.6-7.3	0	0	0	0
	4-7	20-40	6.6-7.8	0	0	0	0
	7-12	20-40	6.6-7.8	0	0	0	0
	12-17	20-40	6.6-7.8	0	0	0	0
	17-26	5.0-25	7.9-8.4	5-15	0	0	0
	26-37	5.0-25	7.9-8.4	5-15	0	0	0
	37-60	5.0-25	7.9-8.4	5-15	0	0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
80:							
Stoneham	0-3	10-20	6.6-7.8	0	0	0	0
	3-6	10-20	6.6-7.8	0	0	0	0
	6-10	10-20	7.9-9.0	5-15	0	0.0-2.0	0
	10-27	10-20	7.9-9.0	5-15	0	0.0-2.0	0
	27-60	10-20	7.9-9.0	5-15	0	0.0-2.0	0
81:							
Stoneham	0-3	10-20	6.6-7.8	0	0	0	0
	3-6	10-20	6.6-7.8	0	0	0	0
	6-10	10-20	7.9-9.0	5-15	0	0.0-2.0	0
	10-27	10-20	7.9-9.0	5-15	0	0.0-2.0	0
	27-60	10-20	7.9-9.0	5-15	0	0.0-2.0	0
Fort Collins	0-5	10-15	6.6-7.8	0	0	0	0
	5-9	10-15	6.6-7.8	0	0	0	0
	9-19	10-25	6.6-7.8	0	0	0	0
	19-26	5.0-20	7.9-9.0	5-15	0	0.0-2.0	0
	26-60	5.0-20	7.9-9.0	5-15	0	0.0-2.0	0
82:							
Stoneham	0-3	10-20	6.6-7.8	0	0	0	0
	3-6	10-20	6.6-7.8	0	0	0	0
	6-10	10-20	7.9-9.0	5-15	0	0.0-2.0	0
	10-27	10-20	7.9-9.0	5-15	0	0.0-2.0	0
	27-60	10-20	7.9-9.0	5-15	0	0.0-2.0	0
Kimst	0-6	10-20	7.4-8.4	5-10	0	0	0
	6-12	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
	12-60	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
Fort Collins	0-5	10-15	6.6-7.8	0	0	0	0
	5-9	10-15	6.6-7.8	0	0	0	0
	9-19	10-25	6.6-7.8	0	0	0	0
	19-26	5.0-20	7.9-9.0	5-15	0	0.0-2.0	0
	26-60	5.0-20	7.9-9.0	5-15	0	0.0-2.0	0
83:							
Ulmet	0-4	10-20	6.6-7.3	0	0	0	0
	4-7	20-40	6.6-7.8	0	0	0	0
	7-12	20-40	6.6-7.8	0	0	0	0
	12-17	20-40	6.6-7.8	0	0	0	0
	17-26	5.0-25	7.9-8.4	5-15	0	0	0
	26-37	5.0-25	7.9-8.4	5-15	0	0	0
	37-60	5.0-25	7.9-8.4	5-15	0	0	0
84:							
Ulysses	0-4	5.0-20	6.6-7.8	0	0	0	0
	4-10	5.0-20	6.6-7.8	0	0	0	0
	10-19	10-20	7.4-8.4	5-15	0	0	0
	19-60	5.0-20	7.9-8.4	5-15	0	0	0
85:							
Valent	0-8	3.0-5.0	6.6-7.8	0	0	0	0
	8-60	2.0-5.0	7.4-7.8	0	0	0	0
86:							
Valent	0-4	3.0-5.0	6.6-7.8	0	0	0	0
	4-7	2.0-5.0	7.4-7.8	0	0	0	0
	7-60	2.0-5.0	7.4-7.8	0	0	0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
87:							
Valent	0-9	4.0-10	6.6-7.8	0	0	0	0
	9-14	2.0-5.0	7.4-7.8	0	0	0	0
	14-60	2.0-5.0	7.4-7.8	0	0	0	0
88:							
Valent	0-9	4.0-10	6.6-7.8	0	0	0	0
	9-14	2.0-5.0	7.4-7.8	0	0	0	0
	14-60	2.0-5.0	7.4-7.8	0	0	0	0
89:							
Vona	0-5	5.0-15	6.6-7.8	0	0	0	0
	5-10	5.0-15	6.6-8.4	0-10	0	0	0
	10-15	5.0-15	6.6-8.4	0-10	0	0	0
	15-25	2.0-10	7.9-8.4	5-15	0	0	0
	25-33	2.0-10	7.9-8.4	5-15	0	0	0
	33-42	2.0-10	7.9-8.4	5-15	0	0	0
	42-61	3.0-10	7.9-8.4	5-15	0	0	0
90:							
Wages	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	10-25	7.4-7.8	0	0	0	0
	12-17	10-20	7.9-8.4	5-15	0	0	0
	17-60	4.0-20	7.9-8.4	5-15	0	0	0
91:							
Wages	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	10-25	7.4-7.8	0	0	0	0
	12-17	10-20	7.9-8.4	5-15	0	0	0
	17-60	4.0-20	7.9-8.4	5-15	0	0	0
92:							
Wages	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	10-25	7.4-7.8	0	0	0	0
	12-17	10-20	7.9-8.4	5-15	0	0	0
	17-60	4.0-20	7.9-8.4	5-15	0	0	0
93:							
Wages	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	10-25	7.4-7.8	0	0	0	0
	12-17	10-20	7.9-8.4	5-15	0	0	0
	17-60	4.0-20	7.9-8.4	5-15	0	0	0
Kimst	0-6	10-20	7.4-8.4	5-10	0	0	0
	6-12	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
	12-60	5.0-20	7.9-8.4	5-15	0	0.0-4.0	0
94:							
Wages	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	10-25	7.4-7.8	0	0	0	0
	12-17	10-20	7.9-8.4	5-15	0	0	0
	17-60	4.0-20	7.9-8.4	5-15	0	0	0
Weld	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	25-40	6.6-7.8	0	0	0	0
	12-18	25-40	6.6-7.8	0	0	0	0
	18-28	15-30	7.9-8.4	5-15	0	0	0
	28-60	10-25	7.9-9.0	5-15	0	0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
95:							
Weld	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	25-40	6.6-7.8	0	0	0	0
	12-18	25-40	6.6-7.8	0	0	0	0
	18-28	15-30	7.9-8.4	5-15	0	0	0
	28-60	10-25	7.9-9.0	5-15	0	0	0
96:							
Weld	0-5	10-20	7.4-7.8	0	0	0	0
	5-12	25-40	6.6-7.8	0	0	0	0
	12-18	25-40	6.6-7.8	0	0	0	0
	18-28	15-30	7.9-8.4	5-15	0	0	0
	28-60	10-25	7.9-9.0	5-15	0	0	0
Norka	0-5	10-20	6.6-7.8	0	0	0	0
	5-13	10-25	6.6-7.8	0	0	0	0
	13-28	10-20	7.9-8.4	5-15	0	0	0
	28-39	10-20	7.9-8.4	5-15	0	0	0
	39-49	5.0-15	7.9-8.4	5-15	0	0	0
	49-67	5.0-15	7.9-8.4	5-15	0	0	0
97:							
Wiley	0-4	5.0-20	6.6-8.4	0-10	0	0	0
	4-10	5.0-20	7.4-9.0	5-15	0	0	0
	10-18	5.0-20	7.4-9.0	5-15	0	0	0
	18-23	5.0-20	7.4-9.0	5-15	0	0	0
	23-60	5.0-15	7.9-9.0	5-20	0	0	0
98:							
Water.							

Table 18.--Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
1:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
2:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
3:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
4:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
5:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
6:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
7:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
8:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
Eckley	B	Jan-Dec	---	---	---	---	None	---	None
9:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
Haxtun	B	Jan-Dec	---	---	---	---	None	---	None
10:									
Bayard	B	Jan-Dec	---	---	---	---	None	---	None
11:									
Beckton	D	Jan-Dec	---	---	---	---	None	---	None
12:									
Bethune	C	Jan-Dec	---	---	---	---	None	---	None
13:									
Canyon	D	Jan-Dec	---	---	---	---	None	---	None
14:									
Canyon	D	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	D	Jan-Dec	---	---	---	---	None	---	None
15:									
Colby	B	Jan-Dec	---	---	---	---	None	---	None
16:									
Colby	B	Jan-Dec	---	---	---	---	None	---	None
17:									
Colby	B	Jan-Dec	---	---	---	---	None	---	None

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
18:									
Colby	B	Jan-Dec	---	---	---	---	None	---	None
19:									
Colby	B	Jan-Dec	---	---	---	---	None	---	None
20:									
Colby	B	Jan-Dec	---	---	---	---	None	---	None
Aridic Ustorthents	B	Jan-Dec	---	---	---	---	None	---	None
21:									
Concordia	D	March	---	---	---	---	None	Brief	Rare
		April	3.0-5.0	>6.0	---	---	None	Brief	Rare
		May	3.0-5.0	>6.0	---	---	None	Brief	Rare
		June	3.0-5.0	>6.0	---	---	None	Brief	Rare
		July	3.0-5.0	>6.0	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
22:									
Eckley	B	Jan-Dec	---	---	---	---	None	---	None
Wages	B	Jan-Dec	---	---	---	---	None	---	None
23:									
Fort Collins	B	Jan-Dec	---	---	---	---	None	---	None
24:									
Glenberg	B	March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
25:									
Glenberg	B	March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
Bankard	A	March	---	---	---	---	None	Very brief	Occasional
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
26:									
Goshen	B	March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
27:									
Haverson	B	May	---	---	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
28:									
Haxtun	B	Jan-Dec	---	---	---	---	None	---	None
29:									
Iliff	C	Jan-Dec	---	---	---	---	None	---	None
30:									
Julesburg	B	Jan-Dec	---	---	---	---	None	---	None
31:									
Julesburg	B	Jan-Dec	---	---	---	---	None	---	None
32:									
Julesburg	B	Jan-Dec	---	---	---	---	None	---	None
33:									
Julesburg	B	Jan-Dec	---	---	---	---	None	---	None
34:									
Julesburg	B	Jan-Dec	---	---	---	---	None	---	None
Otero	B	Jan-Dec	---	---	---	---	None	---	None
35:									
Keith	B	Jan-Dec	---	---	---	---	None	---	None
36:									
Kimst	B	Jan-Dec	---	---	---	---	None	---	None
37:									
Kimst	B	Jan-Dec	---	---	---	---	None	---	None
38:									
Kimst	B	Jan-Dec	---	---	---	---	None	---	None
Canyon	D	Jan-Dec	---	---	---	---	None	---	None
39:									
Kimst	B	Jan-Dec	---	---	---	---	None	---	None
Richfield	C	Jan-Dec	---	---	---	---	None	---	None
40:									
Kimst	B	Jan-Dec	---	---	---	---	None	---	None
Wages	B	Jan-Dec	---	---	---	---	None	---	None
41:									
Kitcarson	B	March	2.0-3.0	>6.0	---	---	None	Brief	Rare
		April	2.0-3.0	>6.0	---	---	None	Brief	Rare
		May	2.0-3.0	>6.0	---	---	None	Brief	Rare
		June	2.0-3.0	>6.0	---	---	None	Brief	Rare
		July	2.0-3.0	>6.0	---	---	None	Brief	Rare
		August	2.0-3.0	>6.0	---	---	None	Brief	Rare
		September	2.0-3.0	>6.0	---	---	None	Brief	Rare

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table			Ponding		Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
42:									
Kuma	B	Jan-Dec	---	---	---	---	None	---	None
Keith	B	Jan-Dec	---	---	---	---	None	---	None
43:									
Kuma	B	Jan-Dec	---	---	---	---	None	---	None
Keith	B	Jan-Dec	---	---	---	---	None	---	None
44:									
Manter	B	Jan-Dec	---	---	---	---	None	---	None
45:									
Manter	B	Jan-Dec	---	---	---	---	None	---	None
46:									
Manter	B	Jan-Dec	---	---	---	---	None	---	None
47:									
Manter	B	Jan-Dec	---	---	---	---	None	---	None
48:									
Manter	B	Jan-Dec	---	---	---	---	None	---	None
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
49:									
Manter	B	Jan-Dec	---	---	---	---	None	---	None
Otero	B	Jan-Dec	---	---	---	---	None	---	None
50:									
Manzanst	C	April	---	---	---	---	None	---	Rare
		May	---	---	---	---	None	---	Rare
		June	---	---	---	---	None	---	Rare
		July	---	---	---	---	None	---	Rare
		August	---	---	---	---	None	---	Rare
		Jan-Dec	---	---	---	---	None	---	None
51:									
Midway	D	Jan-Dec	---	---	---	---	None	---	None
Razor	C	Jan-Dec	---	---	---	---	None	---	None
52:									
Norka	B	Jan-Dec	---	---	---	---	None	---	None
53:									
Norka	B	Jan-Dec	---	---	---	---	None	---	None
54:									
Norka	B	Jan-Dec	---	---	---	---	None	---	None
Colby	B	Jan-Dec	---	---	---	---	None	---	None
55:									
Norka	B	Jan-Dec	---	---	---	---	None	---	None
Colby	B	Jan-Dec	---	---	---	---	None	---	None
56:									
Norka	B	Jan-Dec	---	---	---	---	None	---	None

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
56:									
Colby	B	Jan-Dec	---	---	---	---	None	---	None
57:									
Norka	B	Jan-Dec	---	---	---	---	None	---	None
Colby	B	Jan-Dec	---	---	---	---	None	---	None
Weld	C	Jan-Dec	---	---	---	---	None	---	None
58:									
Nunn	C	Jan-Dec	---	---	---	---	None	---	None
59:									
Nunn	C	Jan-Dec	---	---	---	---	None	---	None
60:									
Olnest	B	Jan-Dec	---	---	---	---	None	---	None
61:									
Olnest	B	Jan-Dec	---	---	---	---	None	---	None
62:									
Olnest	B	Jan-Dec	---	---	---	---	None	---	None
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
63:									
Otero	B	Jan-Dec	---	---	---	---	None	---	None
64:									
Otero	B	Jan-Dec	---	---	---	---	None	---	None
Olnest	B	Jan-Dec	---	---	---	---	None	---	None
65:									
Oxyaquic Ustifluvents	D	March	0.5-1.5	>6.0	---	---	None	Brief	Occasional
		April	0.5-1.5	>6.0	---	---	None	Brief	Occasional
		May	0.5-1.5	>6.0	---	---	None	Brief	Occasional
		June	0.5-1.5	>6.0	---	---	None	Brief	Occasional
		July	0.5-1.5	>6.0	---	---	None	Brief	Occasional
		August	0.5-1.5	>6.0	---	---	None	Brief	Occasional
		September	0.5-1.5	>6.0	---	---	None	Brief	Occasional
66:									
Paoli	B	March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
67:									
Pits, gravel	A	Jan-Dec	---	---	---	---	None	---	None
68:									
Platner	C	Jan-Dec	---	---	---	---	None	---	None

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
69:									
Pleasant	D	April	---	---	0.0-2.0	Brief	Occasional	---	None
		May	0.0	>6.0	0.0-2.0	Brief	Occasional	---	None
		June	0.0	>6.0	0.0-2.0	Brief	Occasional	---	None
		July	0.0	>6.0	0.0-2.0	Brief	Occasional	---	None
		August	0.0	>6.0	---	---	None	---	None
70:									
Rago	C	April	---	---	---	---	None	Brief	Occasional
		May	---	---	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
71:									
Rago	C	Jan-Dec	---	---	---	---	None	---	None
Weld	C	Jan-Dec	---	---	---	---	None	---	None
72:									
Richfield	C	Jan-Dec	---	---	---	---	None	---	None
73:									
Richfield	C	Jan-Dec	---	---	---	---	None	---	None
74:									
Richfield	C	Jan-Dec	---	---	---	---	None	---	None
75:									
Sampson	B	April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
76:									
Satanta	B	Jan-Dec	---	---	---	---	None	---	None
77:									
Satanta	B	Jan-Dec	---	---	---	---	None	---	None
Colby	B	Jan-Dec	---	---	---	---	None	---	None
78:									
Satanta	B	Jan-Dec	---	---	---	---	None	---	None
Sampson	B	April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
79:									
Satanta	B	Jan-Dec	---	---	---	---	None	---	None
Ulmet	C	Jan-Dec	---	---	---	---	None	---	None
80:									
Stoneham	B	Jan-Dec	---	---	---	---	None	---	None
81:									
Stoneham	B	Jan-Dec	---	---	---	---	None	---	None

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
81:									
Fort Collins	B	Jan-Dec	---	---	---	---	None	---	None
82:									
Stoneham	B	Jan-Dec	---	---	---	---	None	---	None
Kimst	B	Jan-Dec	---	---	---	---	None	---	None
Fort Collins	B	Jan-Dec	---	---	---	---	None	---	None
83:									
Ulmet	C	Jan-Dec	---	---	---	---	None	---	None
84:									
Ulysses	B	Jan-Dec	---	---	---	---	None	---	None
85:									
Valent	A	Jan-Dec	---	---	---	---	None	---	None
86:									
Valent	A	Jan-Dec	---	---	---	---	None	---	None
87:									
Valent	A	Jan-Dec	---	---	---	---	None	---	None
88:									
Valent	A	Jan-Dec	---	---	---	---	None	---	None
89:									
Vona	B	Jan-Dec	---	---	---	---	None	---	None
90:									
Wages	B	Jan-Dec	---	---	---	---	None	---	None
91:									
Wages	B	Jan-Dec	---	---	---	---	None	---	None
92:									
Wages	B	Jan-Dec	---	---	---	---	None	---	None
93:									
Wages	B	Jan-Dec	---	---	---	---	None	---	None
Kimst	B	Jan-Dec	---	---	---	---	None	---	None
94:									
Wages	B	Jan-Dec	---	---	---	---	None	---	None
Weld	C	Jan-Dec	---	---	---	---	None	---	None
95:									
Weld	C	Jan-Dec	---	---	---	---	None	---	None
96:									
Weld	C	Jan-Dec	---	---	---	---	None	---	None
Norka	B	Jan-Dec	---	---	---	---	None	---	None
97:									
Wiley	B	Jan-Dec	---	---	---	---	None	---	None

Table 18.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
98:									
Water.									

Table 19.--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	
	Depth to top	Kind		Uncoated steel	Concrete
	In				
1:					
Ascalon	---	---	Moderate	High	Low
2:					
Ascalon	---	---	Moderate	High	Low
3:					
Ascalon	---	---	Moderate	High	Low
4:					
Ascalon	---	---	Moderate	High	Low
5:					
Ascalon	---	---	Moderate	High	Low
6:					
Ascalon	---	---	Moderate	High	Low
7:					
Ascalon	---	---	Moderate	High	Low
8:					
Ascalon	---	---	Moderate	High	Low
Eckley	12-20	Strongly contrasting textural stratification	Low	Moderate	Low
9:					
Ascalon	---	---	Moderate	High	Low
Haxtun	---	---	Moderate	High	Low
10:					
Bayard	---	---	Moderate	High	Low
11:					
Beckton	2-4	Natric horizon	Low	High	High
12:					
Bethune	20-40	Bedrock (paralithic)	Moderate	High	Low
13:					
Canyon	10-20	Bedrock (paralithic)	Low	High	Low
14:					
Canyon	10-20	Bedrock (paralithic)	Low	High	Low
Rock outcrop	0	Bedrock (lithic)	None	---	---
15:					
Colby	---	---	Moderate	High	Low
16:					
Colby	---	---	Moderate	High	Low

Table 19.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Depth to top	Kind		Uncoated steel	Concrete
	In				
17:					
Colby	---	---	Moderate	High	Low
18:					
Colby	---	---	Moderate	High	Low
19:					
Colby	---	---	Moderate	High	Low
20:					
Colby	---	---	Moderate	High	Low
Aridic Ustorthents	---	---	Moderate	Moderate	Low
21:					
Concordia	2-20	Natric horizon	Moderate	High	High
22:					
Eckley	12-20	Strongly contrasting textural stratification	Low	Moderate	Low
Wages	---	---	Moderate	Moderate	Low
23:					
Fort Collins	---	---	Low	High	Low
24:					
Glenberg	---	---	Low	High	Low
25:					
Glenberg	---	---	Low	High	Low
Bankard	---	---	Low	Moderate	Low
26:					
Goshen	---	---	Moderate	High	Low
27:					
Haverson	---	---	Low	High	Low
28:					
Haxtun	---	---	Moderate	High	Low
29:					
Iliff	20-40	Bedrock (lithic)	Moderate	High	Low
30:					
Julesburg	---	---	Moderate	Moderate	Low
31:					
Julesburg	---	---	Moderate	Moderate	Low
32:					
Julesburg	---	---	Moderate	Moderate	Low
33:					
Julesburg	---	---	Moderate	Moderate	Low
34:					
Julesburg	---	---	Moderate	Moderate	Low
Otero	---	---	Low	High	Low

Table 19.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Depth to top	Kind		Uncoated steel	Concrete
	In				
35:					
Keith	---	---	Moderate	High	Low
36:					
Kimst	---	---	Low	High	Low
37:					
Kimst	---	---	Low	High	Low
38:					
Kimst	---	---	Low	High	Low
Canyon	10-20	Bedrock (paralithic)	Low	High	Low
39:					
Kimst	---	---	Low	High	Low
Richfield	---	---	Low	High	Low
40:					
Kimst	---	---	Low	High	Low
Wages	---	---	Moderate	Moderate	Low
41:					
Kitcarson	---	---	Moderate	High	Low
42:					
Kuma	---	---	Low	High	Low
Keith	---	---	Moderate	High	Low
43:					
Kuma	---	---	Low	High	Low
Keith	---	---	Moderate	High	Low
44:					
Manter	---	---	Moderate	High	Low
45:					
Manter	---	---	Moderate	High	Low
46:					
Manter	---	---	Moderate	High	Low
47:					
Manter	---	---	Moderate	High	Low
48:					
Manter	---	---	Moderate	High	Low
Ascalon	---	---	Moderate	High	Low
49:					
Manter	---	---	Moderate	High	Low
Otero	---	---	Low	High	Low
50:					
Manzanst	---	---	Low	High	Low

Table 19.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Depth to top	Kind		Uncoated steel	Concrete
	In				
51:					
Midway	6-20	Bedrock (paralithic)	Low	High	Low
Razor	20-40	Bedrock (paralithic)	Low	High	High
52:					
Norka	---	---	Moderate	Moderate	Low
53:					
Norka	---	---	Moderate	Moderate	Low
54:					
Norka	---	---	Moderate	Moderate	Low
Colby	---	---	Moderate	High	Low
55:					
Norka	---	---	Moderate	Moderate	Low
Colby	---	---	Moderate	High	Low
56:					
Norka	---	---	Moderate	Moderate	Low
Colby	---	---	Moderate	High	Low
57:					
Norka	---	---	Moderate	Moderate	Low
Colby	---	---	Moderate	High	Low
Weld	---	---	Low	High	Low
58:					
Nunn	---	---	Moderate	High	Low
59:					
Nunn	---	---	Moderate	High	Low
60:					
Olnest	---	---	Moderate	High	Low
61:					
Olnest	---	---	Moderate	High	Low
62:					
Olnest	---	---	Moderate	High	Low
Ascalon	---	---	Moderate	High	Low
63:					
Otero	---	---	Low	High	Low
64:					
Otero	---	---	Low	High	Low
Olnest	---	---	Moderate	High	Low
65:					
Oxyaquic Ustifluvents	---	---	High	High	Low

Table 19.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Depth to top	Kind		Uncoated steel	Concrete
	In				
66:					
Paoli	---	---	Moderate	Moderate	Low
67:					
Pits, gravel.					
68:					
Platner	---	---	Low	Moderate	Low
69:					
Pleasant	---	---	Low	High	Low
70:					
Rago	---	---	Moderate	High	Low
71:					
Rago	---	---	Moderate	High	Low
Weld	---	---	Low	High	Low
72:					
Richfield	---	---	Low	High	Low
73:					
Richfield	---	---	Low	High	Low
74:					
Richfield	---	---	Low	High	Low
75:					
Sampson	---	---	Moderate	High	Low
76:					
Satanta	---	---	Moderate	Moderate	Low
77:					
Satanta	---	---	Moderate	Low	Low
Colby	---	---	Moderate	High	Low
78:					
Satanta	---	---	Moderate	Moderate	Low
Sampson	---	---	Moderate	High	Low
79:					
Satanta	---	---	Moderate	Moderate	Low
Ulmet	---	---	Low	High	Low
80:					
Stoneham	---	---	Low	High	Low
81:					
Stoneham	---	---	Low	High	Low
Fort Collins	---	---	Low	High	Low
82:					
Stoneham	---	---	Low	High	Low
Fort Collins	---	---	Low	High	Low
Kimst	---	---	Low	High	Low

Table 19.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Depth to top	Kind		Uncoated steel	Concrete
	In				
83:					
Ulmet	---	---	Low	High	Low
84:					
Ulysses	---	---	Moderate	High	Low
85:					
Valent	---	---	Low	Moderate	Low
86:					
Valent	---	---	Low	Moderate	Low
87:					
Valent	---	---	Low	Moderate	Low
88:					
Valent	---	---	Low	Moderate	Low
89:					
Vona	---	---	Low	High	Low
90:					
Wages	---	---	Moderate	Moderate	Low
91:					
Wages	---	---	Moderate	Moderate	Low
92:					
Wages	---	---	Moderate	Moderate	Low
93:					
Wages	---	---	Moderate	Moderate	Low
Kimst	---	---	Low	High	Low
94:					
Wages	---	---	Moderate	Moderate	Low
Weld	---	---	Low	High	Low
95:					
Weld	---	---	Low	High	Low
96:					
Weld	---	---	Low	High	Low
Norka	---	---	Moderate	Moderate	Low
97:					
Wiley	---	---	Moderate	High	Low
98:					
Water.					

Table 20.--Classification of the Soils

Soil name	Family or higher taxonomic class
Altvan	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Aridic Argiustolls
Aridic Ustorthents	Aridic Ustorthents
Arvada	Fine, smectitic, mesic Ustic Natrargids
Ascalon	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls
Baca	Fine, smectitic, mesic Aridic Haplustalfs
Bankard	Sandy, mixed, mesic Ustic Torrifluvents
Bayard	Coarse-loamy, mixed, superactive, mesic Torriorthentic Haplustolls
Beckton	Fine, smectitic, mesic Aridic Natrustolls
Bethune	Fine, smectitic, mesic Aridic Argiustolls
Bijou	Coarse-loamy, mixed, superactive, mesic Ustic Haplargids
Canyon	Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents
Colby	Fine-silty, mixed, superactive, calcareous, mesic Aridic Ustorthents
Concordia	Fine, smectitic, mesic Typic Natrustalfs
Dwyer	Mixed, mesic Ustic Torripsamments
Eckley	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Aridic Argiustolls
Fort Collins	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Glenberg	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents
Goshen	Fine-silty, mixed, superactive, mesic Pachic Argiustolls
Haverson	Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustifluvents
Haxtun	Fine-loamy, mixed, superactive, mesic Pachic Argiustolls
Iliff	Fine, smectitic, mesic Aridic Paleustolls
Julesburg	Coarse-loamy, mixed, superactive, mesic Aridic Argiustolls
Keith	Fine-silty, mixed, superactive, mesic Aridic Argiustolls
Kimst	Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Kitcarson	Coarse-loamy, mixed, superactive, calcareous, mesic Oxyaquic Ustifluvents
Kuma	Fine-silty, mixed, superactive, mesic Pachic Argiustolls
Las Animas	Coarse-loamy, mixed, superactive, calcareous, mesic Typic Fluvaquents
Lodgepole	Fine, smectitic, mesic Typic Argiaquolls
Manter	Coarse-loamy, mixed, superactive, mesic Aridic Argiustolls
Manzanst	Fine, smectitic, mesic Aridic Haplustalfs
Midway	Clayey, smectitic, calcareous, mesic, shallow Ustic Torriorthents
Norka	Fine-silty, mixed, superactive, mesic Aridic Argiustolls
Nunn	Fine, smectitic, mesic Aridic Argiustolls
Olnest	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Otero	Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Oxyaquic Ustifluvents	Oxyaquic Ustifluvents
Paoli	Coarse-loamy, mixed, superactive, mesic Pachic Haplustolls
Platner	Fine, smectitic, mesic Aridic Paleustolls
Pleasant	Fine, smectitic, mesic Torrertic Argiustolls
Rago	Fine, smectitic, mesic Pachic Argiustolls
Razor	Fine, smectitic, mesic Ustic Haplocambids
Richfield	Fine, smectitic, mesic Aridic Argiustolls
Sampson	Fine-loamy, mixed, superactive, mesic Pachic Argiustolls
Satanta	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls
Stoneham	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Ulmet	Fine, smectitic, mesic Aridic Haplustalfs
Ulysses	Fine-silty, mixed, superactive, mesic Aridic Haplustolls
Valent	Mixed, mesic Ustic Torripsamments
Vona	Coarse-loamy, mixed, superactive, mesic Aridic Haplustalfs
Wages	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls
Weld	Fine, smectitic, mesic Aridic Paleustolls
Wiley	Fine-silty, mixed, superactive, mesic Aridic Haplustalfs

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