United States Department of Agriculture

NRCS

Natural Resources Conservation Service

United States Department of Interior, National Park Service

In cooperation with the United States Department of the Interior, National Park Service and Colorado State University

Soil Survey of Rocky Mountain National Park, 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.

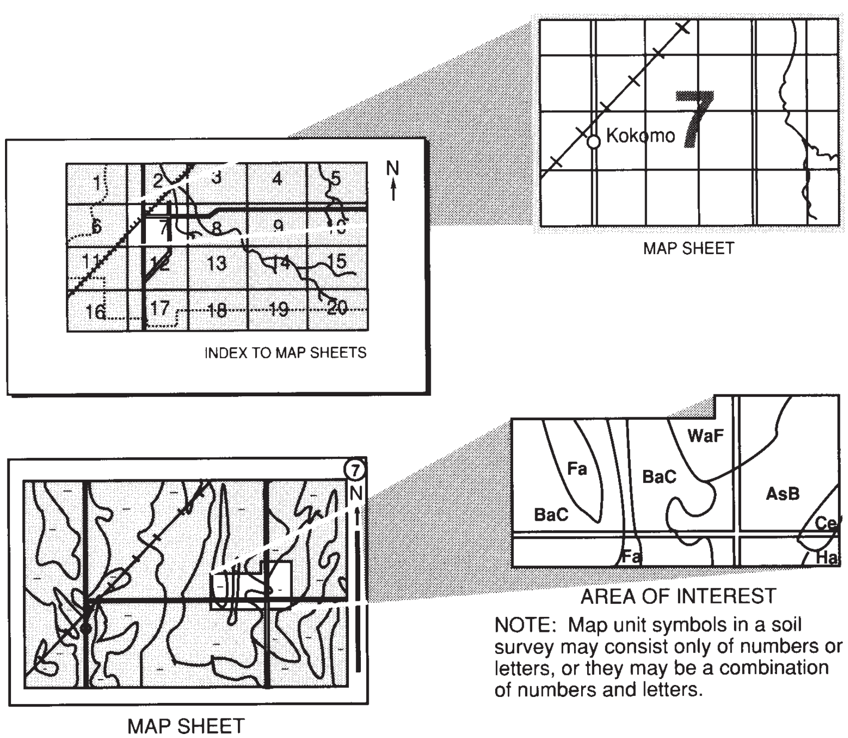
Detailed Soil Maps

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.



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 1998. Soil names and descriptions were approved in 1999. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1998. This survey was made cooperatively by the Natural Resources Conservation Service; the United States Department of Interior, National Park Service; and Colorado State University. The survey is part of the technical assistance furnished to the National Park Service.

A small part of this soil survey was published in 1983 as a part of the Soil Survey of Grand County Area, Colorado. That portion in Grand County (3,240 acres) is superseded by this soil survey.

Cover: Mt. Ypsilon, center, is on map unit 33-Rock outcrop-Rubble land complex, 30 to 200 percent slopes, in an Alpine Life Zone. Shown left of Mt. Ypsilon is map unit 43-Trailridge-Mummy complex, 20 to 60 per cent slopes, in an Alpine Life Zone. Below Mt. Ypsilon is spruce-fir in map unit 45-Ypsilon gravelly coarse sand loam, 20 to 50 percent slopes, in a Subalpine Life Zone. The diagonal stand of lodgepole pine in the left foreground is on map unit 26-Nanita extremely gravelly loamy coarse sand, 30 to 60 percent slopes, in a Montane Life Zone.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

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Foreword

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

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

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

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

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

Allen Green
State Conservationist
Natural Resources Conservation Service

Soil Survey of Rocky Mountain National Park, Colorado

By Lee A. Neve

Fieldwork by Dave Alstatt, Jim Borchert, Jodi Boyce, Lee A. Neve, Michael Petersen, Nathan Storck, Melissa Trenchik, and Tim Wheeler, Natural Resources Conservation Service; and Steve Blecker, Colorado State University.

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
United States Department of Interior, National Park Service; and Colorado State University

General Nature of the Area

Rocky Mountain National Park is located in the north central part of Colorado (fig.1). It covers a total area of 266,200 acres: 142,500 acres in Larimer County, 98,100 acres in Grand County, and 25,600 acres in Boulder County.

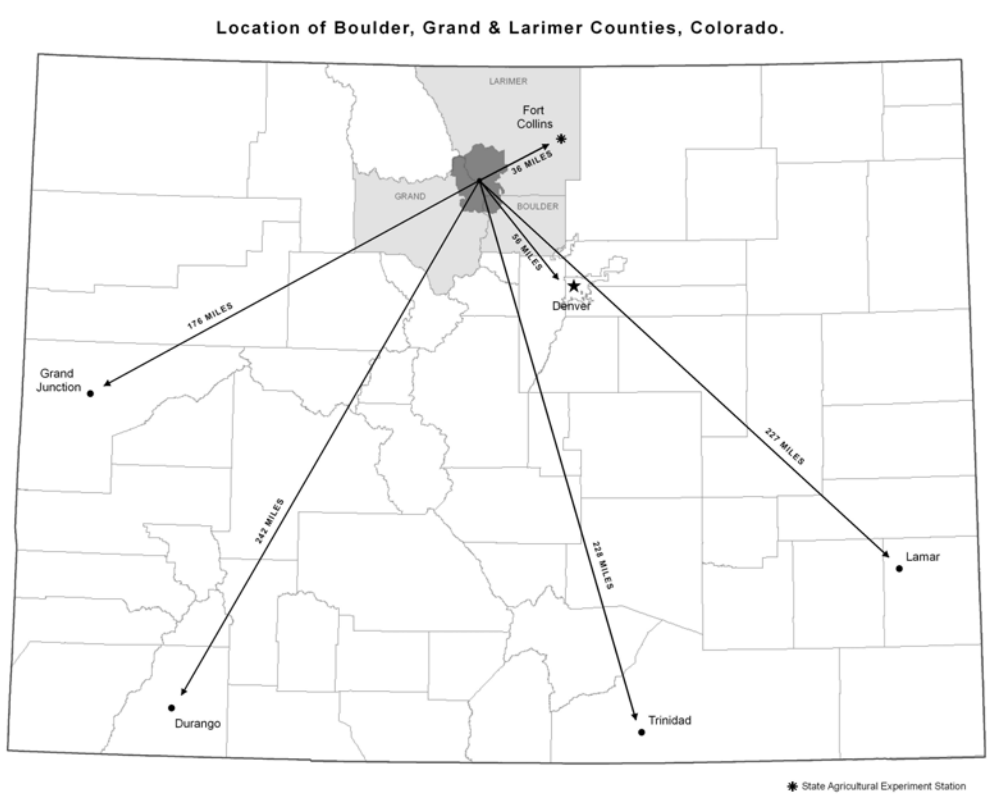

Figure 1.—Location of Rocky Mountain National Park in Colorado.

The Park has a wide range of vegetation types, climates, and elevations. The soils of the *Alpine Life Zone* have a very short frost-free period (10 to 30 days), little vegetation (dominantly Bellardi bog sedge, alpine bluegrass, avens, and tufted hairgrass) or no vegetation on the Rock outcrop and Rubble land. This zone ranges from 10,000 to 13,460 feet in elevation and receives 30 to 40 inches of precipitation per year.

The soils in the *Subalpine Life Zone* have a slightly longer frost-free period (10 to 50 days) and support subalpine-fir, Engelmann's spruce, grouse whortleberry, Ross sedge, elk sedge, and heartleaf arnica. The Subalpine Life Zone ranges from 9,000 to 12,000 feet in elevation and receives 24 to 40 inches of precipitation per year.

The soils of the *Montane Life Zone* have a frost-free period of 40 to 100 days. This zone supports lodgepole pine, Rocky Mountain Douglas-fir, Engelmann's spruce, elk sedge, common juniper, kinnikinnick, and fivepetal cliffbush. The Montane Life Zone ranges from 8,000 to 10,000 feet in elevation and receives 16 to 24 inches of precipitation per year.

The soils of the *Riparian Life Zone* have a frost-free period of 40 to 75 days and support tufted hairgrass, water sedge, alpine timothy, diamondleaf willow, and grayleaf willow. The Riparian Life Zone ranges from 8,000 to 10,700 feet in elevation and receives 18 to 40 inches of precipitation per year.

The soils in Rocky Mountain National Park range widely in texture, depth, and other characteristics. Soils in the Alpine Life Zone formed in gravelly slope alluvium, or residuum, colluvium, or till derived from granite, gneiss, or schist, are shallow and very deep, and are somewhat excessively drained. The soils in the Subalpine Life Zone formed in colluvium, till, slope alluvium, or residuum derived from granite, gneiss, or schist, are very deep and shallow, and are somewhat excessively drained. The soils in the Montane Life Zone formed in sandy and gravelly till and in gravelly slope alluvium derived from granite, gneiss, and schist, are very deep and shallow, and are somewhat excessively drained. The soils in the Riparian Life Zone formed in alluvium derived from granite, gneiss, and schist, are very deep, and are poorly or moderately well drained.

None of the soils in the Park are considered to be prime farmland.

History of Rocky Mountain National Park

Early Inhabitants

During the Ice Age when massive glaciers were grinding the landscape, shaping the meadows and peaks, the area that would become Rocky Mountain National Park was an inhospitable land. It was not until some 11,000 years ago that humans began venturing into these valleys and mountains.

Native Peoples

Spearheads broken in the fury of a mammoth's charge and scrapers discarded along a nomad's trail tell us little about the area's early native peoples. We do know that even though it was never their year-round home, the green valleys, tundra meadows, and crystal lakes became favored summer hunting grounds for the Ute tribe. In setting up their camps, they made use of the straight and slender lodgepole pine as tepee poles. Until the late 1700s, the Ute Indian Tribe controlled the mountain territories.

Tepee rings and other signs of summer camps were still evident by the time the first settlers arrived, but few vestiges of those times remain today, other than the large river boulders that Native Americans carried to the top of Oldman Mountain, a site of their ceremonial vision quests.

Early Explorers and Settlers

The United States acquired the Park’s original 358.5 square miles in the huge Louisiana Purchase of 1803. French trappers and the Spanish explorers before them seem to have skirted the current park boundaries in their wilderness forays. Even Major Stephen H. Long and his expedition forces avoided these rugged barricades in 1820. Long was never closer than 40 miles to the peak named for him.

Published in 1843, *Scenes in the Rocky Mountains* described the explorations of Rufus Sage from Connecticut. It was the first account of the area’s wonders to reach incredulous easterners. Sage spent four years roaming the Rockies, basing his explorations from Fort Lupton, north of present-day Denver. For a month, Sage hunted deer in the area now known as Estes Park.

The first settler in the area was Joel Estes, a Kentuckian. Scouting for game one fall, he and his son climbed a high promontory that gave them a view of a breathtakingly beautiful valley. In 1860, Estes moved his family into a new home in the area now known as Estes Park.

Winters proved too harsh for cattle, so six years later the Estes family sold out for a yoke of oxen. The Estes cabin was soon converted into guest accommodations, and beginning in 1867 the number of visitors to this area grew steadily.

A Mountain Mecca

The Rockies continued to attract the adventurous, including the great explorer John Wesley Powell, who conquered the summit of Longs Peak in 1868. Just five years later, Anna Dickinson became the first woman to succeed in the climb.

Isabella Bird, an Englishwoman whose extensive travels and writings earned her the first female membership in the Royal Geographic Society, visited Estes Park in the fall of 1873. Bird’s book, *A Lady’s Life in the Rocky Mountains*, attracted many people to the area, as did Frederick Chapin’s *Mountaineering in Colorado*.

While much of the West was attracting homesteaders, the Rockies were also becoming established as a tourist mecca. By 1874, a stage line ran between Estes Park and Longmont by way of North Saint Vrain Canyon. About that time, an English earl, Lord Dunraven, arrived and laid questionable claim to 15,000 acres as his private game preserve. He also built the fine Estes Park Hotel.

Miners and Homesteaders

Because large veins of silver and gold had been discovered in other areas of the Rockies, miners considered the area a land of opportunity and came in droves during Colorado’s gold rush of the late 1870s. Lulu City, in what is now the northwest part of Rocky Mountain National Park, was a booming mining town in 1880 with a raucous reputation. Three years later, it was nearly deserted because the region’s mineral riches were far less than the miners dreamed.

When the miners and first settlers arrived, there seemed no end to the supply of game. Bear, deer, wolves, and elk were abundant. To feed the boom town demand, commercial hunters went to work: a single hunter could deliver a weekly supply of three tons of assorted big-game meat.

The rousing boom times yielded to an industrious homesteading period. Ranchers and farmers felt that the real wealth of the Rockies lay in its water. They fought over rights to it (finally running the Earl of Dunraven out of town) and built ambitious canal systems to transfer water from the wetter western slopes to the drier eastern plains. The Grand Ditch in the Never Summer Range in the Park intercepted the stream source of the Colorado River and diverted it for use for cattle and crops. Though homesteading proved no more profitable than mining in this land, another enterprise showed promise: dude ranches began attracting city dwellers in quest of an original adventure.

Protecting the Rockies

In 1903, F.O. Stanley, inventor of the Stanley Steamer automobile, came to Estes Park, Colorado for his health. Impressed by the beauty of the valley and grateful for the improvement in his health, he decided to invest his money and his future there. In 1909, he opened the elegant Stanley Hotel, a classic inn exemplifying the golden age of hostelry.

Largely due to Stanley's efforts, the Estes Park Protective and Improvement Association was established to protect local wildflowers and wildlife and to improve roads and trails. "Those who pull flowers up by the roots will be condemned by all worthy people, and also by the Estes Park Protective and Improvement Association," they warned. It was the start of a conservation ethic that has become increasingly important and complex.

National Park Status

Even more important to the future of Rocky Mountain National Park was Enos Mills, who came to the Longs Peak area in 1884 when he was 14 years old. A dedicated naturalist, he wrote eloquent books about the area's natural history. Not long after his arrival, Mills bought the Longs Peak Inn and began conducting local nature trips.

In 1909, Mills first proposed that the area become the Nation's tenth national park to preserve the wildlands from inappropriate use. It was his vision that visitors would arrive years later to experience the wonderful Rocky Mountain wilderness he knew. "In years to come when I am asleep beneath the pines, thousands of families will find rest and hope in this park," he proclaimed.

Unleashing his diverse talents and inexhaustible energy, he spent several years lecturing across the nation, writing thousands of letters and articles, and lobbying Congress to create a new national park that would stretch from the Wyoming border south to Pikes Peak, covering more than 1,000 square miles. Most civic leaders supported the idea, as did the Denver Chamber of Commerce and the Colorado Mountain Club. In general, the mining, logging, and agricultural interests opposed it. The compromise drafted by James G. Rogers, the first president of the Colorado Mountain Club, was the establishment of a smaller park (358.3 square miles). On January 26, 1915, under President Woodrow Wilson, it was declared Rocky Mountain National Park.

The Park has since grown to more than 415 square miles. In 1990, it gained an additional 465 acres when Congress approved expansion of the Park to include the area known as Lily Lake. The National Park Service, the Conservation Fund, and some diligent legislators successfully halted land development in this area adjacent to the Park's boundary. It now is an important buffer zone that helps to protect the migratory routes of wildlife in the Park.

Today, Rocky Mountain National Park stands as a legacy to those pioneers who looked beyond its harvestable resources to its more lasting values.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Estes Park and Grand Lake in the period 1961 to 1990 for Estes Park and 1971 to 2000 for Grand Lake. Table 2 shows probable dates of the first freezing date in fall and the last freezing date in spring. Table 3 provides data on length of the growing season.

In the winter months, the average temperature is 28.0 degrees F for Estes Park and 18.9 degrees F for Grand Lake. The average daily minimum temperature is 16.6 degrees F for Estes Park and 4.5 degrees F for Grand Lake. The lowest temperature on record, which occurred on February 1, 1951, is -39 degrees F in Estes Park and on January 13, 1963, is —43 degrees F for Grand Lake. In summer, the average temperature is 59.9 degrees F and the average daily maximum temperature is 75.8 degrees F for Estes Park. In the summer months, the average temperature is 54.6 degrees F and the average daily maximum temperature is 73.3 degrees F for Grand Lake. The highest recorded temperature, which occurred on July 8, 1989, is 96 degrees F for Estes Park. The highest recorded temperature, which occurred on July 15, 1978, is 92 degrees F for Grand Lake.

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 freezing date in spring and the first freezing date in fall.

The total annual precipitation is about 13.76 inches. Of this, 10.03 inches, or 63 percent, usually falls in April through September in Estes Park. The total annual precipitation is about 20.77 inches. Of this, 11.44 inches, or 55 percent, usually falls in April through September in Grand Lake. The growing season for most crops falls within this period. In two years out of 10, the rainfall in April through September is less than 4.49 inches for Estes Park and 6.08 inches for Grand Lake. The heaviest 1-day rainfall during the period of record was 3.59 inches on July 1, 1976 for Estes Park and 3.20 inches on September 28, 1985 for Grand Lake.

The average seasonal snowfall is about 33.9 inches for Estes Park and 144.1 inches for Grand Lake. On the average, 11 days, for Estes Park, and 158 days, for Grand Lake, of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

How This Survey Was Made

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

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

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

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

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

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

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

This survey area was mapped at two levels of detail. At the more detailed level, map units are narrowly defined. Map unit boundaries were plotted and verified at closely spaced intervals. At the less detailed level, map units are broadly defined. Boundaries were plotted and verified at wider intervals. The detail of mapping was selected to meet the anticipated long-term use of the survey, and the map units were designed to meet the needs for that use.

Conventional soil survey techniques were used for the more detailed level of mapping. Much of the area mapped at this level includes important wetlands and valley areas that are intensively used. These areas were accessible and could be transected efficiently on foot. Soil survey techniques used at the less detailed level were quite different, largely because of the remote and poorly accessible topography. Specially designed geostatistical methods were employed for this area (Cipra et al., 1999).

The geostatistical methods were based on data gathered from block transects that were delineated on aerial photographs prior to the fieldwork. These areas were carefully selected to represent significant landforms, aspects, and plant communities. An individual block had dimensions at the ground surface of 1,000 feet by 2,000 feet and was oriented lengthwise downslope. Each block contained five soil description sites and four satellite sites, each of which was randomly located. The five soil descriptions sites comprised one complete pedon described to a depth of 60 inches, and four pedons described to a depth of 30 to 40 inches (or to a root-limiting layer if above those depths). Standard soil pedon data was collected at the five soil description sites including texture, consistence, pH, horizons, content of rock fragments, slope, aspect, parent material, surface layer content of organic matter, and vegetation. Vegetation, surface layer content of organic matter, slope, aspect, and parent material were described for the four satellite sites.

All soil description sites in the blocks were geographically referenced using global positioning systems and recorded in Universal Transverse Mercator units (UTMs). Data recorded in the blocks allowed soil scientists to identify the typical soils and to describe the composition of the map units. The information was given to Colorado State University and a geostatistical model was developed to analyze the data and provide maps of projected soil components on landforms. The projections were use as a tool to complete mapping in areas that could not be traversed efficiently on foot. Helicopters were used to great advantage in some areas to verify the soil map units that had been predicted by the geostatistical model.

Species of native plants were identified by soil scientists at the sample sites within the block transects. After the vegetative data was compiled, the representative plant community of each soil was correlated to an ecological site described in the U.S. Forest Service system “Plant Associations of Region Two” (USDA-Forest Service, 1987). A thorough and systematic inventory of the vegetation was beyond the scope of this soil survey. Plant specialists or ecologists were not directly involved in identifying or in correlating the vegetation.

General Soil Map Units

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

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

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

Soil Descriptions

Alpine Life Zone

This group consists of one map unit, and makes up about 40 percent of the Park. The soils of this group are steep to very steep. The vegetation consists mainly of dense turfs of sedges and grasses.

The soils of this group are shallow and very deep and somewhat excessively drained. They formed in gravelly slope alluvium, residuum, colluvium, and till derived from granite, gneiss, and schist.

1. Rock outcrop-Rubble land-Trailridge-Mummy (Alpine Life Zone)

Setting

Slope range: 20 to 200 percent
Annual air temperature: 34 to 38 degrees F
Annual precipitation: 30 to 40 inches
Frost-free period: 10 to 30 days

Composition

Rock outcrop: 25 percent of unit
Rubble land: 20 percent of unit
Trailridge soils: 20 percent of unit
Mummy soils: 20 percent of unit
Minor components: 15 percent of unit

Other soils of minor extent:

Archrock soils on mountain flanks, upper third and mountain tops of mountain slopes
Onahu soils on mountain bases of cirques and on mountain slopes

Characteristics of the Rock outcrop

Geomorphic setting: Mountain slopes
Geomorphic position: Mountain flanks
Slope range: 30 to 200 percent
Parent material: Granite, gneiss, and schist

Characteristics of the Rubble land

Geomorphic setting: Mountain slopes
Geomorphic position: Mountain flanks
Parent material: Granite, gneiss, and schist
Slope range: 30 to 200

Characteristics of the Trailridge soil

Geomorphic setting: Mountain slopes
Geomorphic position: Mountain tops
Slope range: 10 to 60 percent
Parent materials: Gravelly slope alluvium and residuum weathered from granite, gneiss, and schist
Depth class: Shallow
Drainage class: Somewhat excessively drained
Ecological site name: Avens/Rock Sedge
Native plant community: Bellardi bog sedge, alpine bluegrass, tufted hairgrass, Montana wheatgrass, Ross' avens, alpine clover, and alpine sagebrush
Surface layer: Extremely gravelly sandy loam
Subsoil: Extremely gravelly coarse sandy loam

Characteristics of the Mummy soil

Geomorphic setting: Mountain slopes
Geomorphic position: Mountain flanks
Slope range: 10 to 60 percent
Parent materials: Colluvium and till derived from granite, gneiss, and schist
Depth class: Very deep
Drainage class: Somewhat excessively drained
Ecological site name: Bellardi Bog Sedge/Avens/Rock Sedge
Native plant community: Bellardi bog sedge, tufted hairgrass, alpine bluegrass, avens, rock sedge, American bistort, alpine clover, cinquefoil, and purple reedgrass
Surface layer: Gravelly sandy loam
Subsoil: Gravelly sandy loam

Subalpine Life Zone

This group consists of one map unit, and makes up about 43 percent of the Park. The soils of this group are gently sloping to very steep. The vegetation consists mainly of subalpine fir, Engelmann's spruce, limber pine, grouse whortleberry, grasses, and forbs.

The soils of this group are very deep and shallow and somewhat excessively drained and well drained. They formed in colluvium, till, slope alluvium, and residuum derived from granite, gneiss, and schist.

2. Fallriver-Hiamovi-Ypsilon (Subalpine Life Zone)

Setting

Slope range: 5 to 65 percent
Annual air temperature: 36 to 42 degrees F
Annual precipitation: 24 to 40 inches
Frost-free period: 10 to 50 days

Composition

Fallriver soils: 40 percent of unit
Hiamovi soils: 20 percent of unit
Ypsilon soils: 10 percent of unit
Minor components: 30 percent of unit

Other soils of minor extent:

Tileston soils on backslopes
Tonahutu soils on backslopes
Enentah soils on backslopes and footslopes

Characteristics of the Fallriver soil

Geomorphic setting: Moraines and mountain slopes
Geomorphic position: Mountain flanks
Slope range: 10 to 55 percent
Parent material: Colluvium and till derived from granite, gneiss, and schist
Ecological site name: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Native plant community: Subalpine fir, Engelmann's spruce, grouse whortleberry, dwarf blueberry, Ross' sedge, bluegrass, elk sedge, heartleaf arnica, and russet buffaloberry
Elevation: 10,500 to 11,800 feet
Depth class: Very deep
Drainage class: Somewhat excessively drained
Surface layer: Gravelly sandy loam
Subsoil: Very cobbly sandy loam

Characteristics of the Hiamovi soil

Geomorphic setting: Mountain slopes
Geomorphic position: Mountain tops and mountain flanks
Slope range: 5 to 65 percent
Parent materials: Gravelly till, gravelly slope alluvium, and residuum weathered from granite, gneiss, and schist
Ecological site name: Lodgepole Pine/Grouse Whortleberry
Native plant community: Lodgepole pine, subalpine fir, Engelmann's spruce, grouse whortleberry, common juniper, Ross' sedge, blue grass, elk sedge, heartleaf arnica, and russet buffaloberry
Elevation: 9,000 to 12,000 feet
Depth class: Shallow
Drainage class: Well drained
Surface layer: Gravelly sandy loam
Subsoil: Extremely gravelly loam

Characteristics of the Ypsilon soil

Geomorphic setting: Moraines and mountain slopes
Geomorphic position: Mountain flanks
Slope range: 20 to 50 percent

Parent materials: Colluvium and till derived from granite, gneiss, and schist
Ecological site name: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Native plant community: Subalpine fir-Engelmann's spruce, limber pine, grouse whortleberry, dwarf blueberry, Ross' sedge, bluegrass, elk sedge, heartleaf arnica, and russet buffaloberry
Elevation: 9,700 to 11,000 feet
Depth class: Very deep
Drainage class: Somewhat excessively drained
Surface layer: Gravelly coarse sandy loam
Subsoil: Extremely stony sandy loam and very cobbly coarse sandy loam

Montane Life Zone

This group consists of one map unit, which makes up about 14 percent of the Park. The soils of this group are gently sloping to steep. The vegetation consists mainly of lodgepole pine, Rocky Mountain Douglas-fir, common juniper, elk sedge, kinnikinnick, and grasses, forbs, and shrubs (fig. 2).

The soils of this group are very deep and shallow and somewhat excessively drained. They formed in till, slope alluvium, and residuum derived from granite, gneiss, and schist.

3. Nanita-Catamont-Rock outcrop (Montane Life Zone)

Setting

Slope range: 1 to 60 percent
Elevation: 7,500 to 10,000 feet
Annual air temperature: 36 to 46 degrees F
Annual precipitation: 16 to 24 inches
Frost-free period: 40 to 100 days

Composition

Nanita soils: 35 percent of unit
Catamont soils: 25 percent of unit
Rock outcrop: 10 percent of unit
Minor components: 30 percent of unit

Other soils of minor extent:

Granile soils on mountain flanks of mountain slopes
Isolation soils on moraines and mountain flanks
Rofork soils structural side slopes of structural benches
Lumpyridge soils on side slopes of fans
Kawuneeche soils on flood plains
Chasmfalls soils on side slopes of fans and mountain flanks of mountain slopes

Characteristics of the Nanita soil

Geomorphic setting: Moraines
Geomorphic position: Mountain bases and flanks
Slope range: 1 to 60 percent
Parent material: Sandy and gravelly till derived from schist, granite, and gneiss
Ecological site name: Lodgepole Pine/Elk Sedge
Native plant community: Lodgepole pine, Rocky Mountain Douglas-fir, Engelmann's spruce, elk sedge, common juniper, kinnikinnick, fivepetal cliffbush, heartleaf arnica, mountain goldenbanner, Wood's rose, and Oregongrape
Elevation: 8,200 to 10,000 feet

Figure 2.—Soils shown here in Horseshoe Park are in Riparian, Montane, and Subalpine Life Zones.

Depth class: Very deep
Drainage class: Somewhat excessively drained
Surface layer: Very gravelly sandy loam
Subsoil: Extremely cobbly loamy sand

Characteristics of the Catamont soil

Geomorphic setting: Structural benches
Geomorphic position: Mountain flanks
Slope range: 5 to 50 percent
Parent material: Gravelly slope alluvium and residuum weathered from granite, schist, and gneiss
Ecological site name: Lodgepole Pine/Kinnikinnick
Native plant community: Lodgepole pine, Rocky Mountain Douglas-fir, Ross' sedge, kinnikinnick, Wood's rose, bluegrass, fivepetal cliffbush, common juniper, spike fescue, and Oregongrape
Elevation: 8,000 to 10,000 feet
Depth class: Shallow
Drainage class: Somewhat excessively drained
Surface layer: Gravelly coarse sandy loam
Subsoil: Very gravelly coarse sandy loam

Characteristics of the Rock outcrop

Geomorphic setting: Mountain slopes, structural benches, and moraines
Geomorphic position: Mountain flanks
Slope range: 20 to 100 percent
Parent material: Granite, schist, and gneiss
Elevation: 8,000 to 10,000 feet

Riparian Life Zone

This group consists of one map unit, and makes up about 3 percent of the Park. The soils of this group are nearly level to strongly sloping. The vegetation consists mainly of tufted hairgrass, sedges, grasses, forbs, and willows.

The soils of this group are very deep and poorly drained and moderately well drained. They formed in alluvium derived from granite, gneiss, and schist.

4. Kawuneeche-Dystrocryepts (Riparian Life Zone)

Setting

Annual air temperature: 36 to 42 degrees F
Annual precipitation: 18 to 40 inches
Frost-free period: 40 to 75 days

Composition

Kawuneeche soils: 65 percent of unit
Dystrocryepts soils: 20 percent of unit
Minor components: 15 percent of unit

Other soils of minor extent:

Venable soils on flood plains
Humic Dystrocryepts soils on fans
Lumpyridge soils on fans

Characteristics of the Kawuneeche soil

Geomorphic setting: Flood plains
Geomorphic position: Flats
Slope range: 0 to 4 percent
Parent materials: Alluvium over sandy and gravelly glaciofluvial deposits derived from granite, gneiss, and schist
Ecological site name: Diamondleaf Willow/Water Sedge
Native plant community: Tufted hairgrass, water sedge, American mannagrass, blue grass, rush, cinquefoil, grayleaf willow, diamondleaf willow, and white marsh marigold
Elevation: 8,000 to 10,700 feet
Depth class: Very deep
Drainage class: Poorly drained
Surface layer: Clay loam
Underlying material: Loam, coarse sandy loam, and very gravelly loamy sand

Characteristics of the Dystrocryepts soil

Geomorphic setting: Drainageways
Geomorphic position: Foot slopes
Slope range: 5 to 15 percent
Parent materials: Alluvium derived from granite, gneiss, and schist
Ecological site name: Tufted Hairgrass/Sedge sp.
Native plant community: Tufted hairgrass, Nebraska sedge, bluegrass, rush, American mannagrass, alpine timothy, bluejoint, shrubby cinquefoil, water sedge, and western wheatgrass
Elevation: 8,500 to 10,700 feet

Depth class: Very deep
Drainage class: Moderately well drained
Surface layer: Loam
Subsoil: Loam

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Kawuneeche loam, 0 to 1 percent slopes, is a phase of the Kawuneeche series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Fallriver-Hiamovi complex, 10 to 55 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Archrock-Fallriver association, 15 to 50 percent slopes, is an example.

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

Table 4 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The *Glossary* defines many of the terms used in describing the soils or miscellaneous areas.

1—Archrock-Fallriver association, 15 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 10,500 to 12,000 feet (3,200 to 3,658 meters)
Mean annual precipitation: 30 to 40 inches (762 to 1,016 millimeters)
Mean annual air temperature: 34 to 38 degrees F. (1.1 to 3.5 degrees C.)
Frost-free period: 10 to 50 days

Map Unit Composition

Archrock and similar soils: 50 percent
Fallriver and similar soils: 35 percent
Minor components: 15 percent

Component Descriptions

Archrock soils
Landform: Mountains
Position on landform: Shoulders and backslopes
Parent material: Gravelly slope alluvium derived from schist, granite, and gneiss
Slope: 15 to 35 percent
Surface fragments: About 45 percent medium and coarse gravel, 20 percent cobbles, and 1 percent stones
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.2 inches (very low)
Shrink-swell potential: About 0.8 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None

Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Alpine Clover/Avens
Potential native vegetation: purple reedgrass, alpine bluegrass, alpine clover, grayleaf willow, groundsel, alpine fescue, cinquefoil, alpine sagebrush, avens, white marsh marigold
Land capability subclass (nonirrigated): 7e

Typical Profile:
A—0 to 8 inches; gravelly loam
Bw—8 to 18 inches; very gravelly loam
2BC—18 to 25 inches; very gravelly coarse sandy loam
2Cr—25 to 35 inches; weathered bedrock

Fallriver soils
Landform: Glaciated mountain slopes
Position on landform: Backslopes
Parent material: Colluvium and till derived from granite, gneiss, and schist
Slope: 15 to 50 percent
Surface fragments: About 1 percent stones and 1 percent cobbles
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Potential native vegetation:
Common trees: Engelmann's spruce, subalpine fir
Other plants: grouse whortleberry, dwarf blueberry, Woods' rose, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 2 inches; moderately decomposed plant material
E—2 to 9 inches; gravelly sandy loam
Bs1—9 to 21 inches; very cobbly sandy loam
Bs2—21 to 35 inches; very cobbly sandy loam
BC—35 to 63 inches; very gravelly coarse sandy loam

Minor Components
Onahu and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Backslopes
Distinguishing characteristics: Onahu soils have a seasonal high water table.

Trailridge and similar soils
Composition: About 5 percent
Landform: Mountains

Position on landform: Summits and shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Ypsilon and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes
Distinguishing characteristics: Ypsilon soils have significant accumulations of iron and aluminum in the subsoil.

2—Archrock-Onahu-Rock outcrop complex, 10 to 75 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 11,000 to 12,500 feet (3,353 to 3,810 meters)
Mean annual precipitation: 30 to 40 inches (762 to 1,016 millimeters)
Mean annual air temperature: 34 to 38 degrees F. (1.1 to 3.3 degrees C.)
Frost-free period: 10 to 30 days

Map Unit Composition

Archrock and similar soils: 35 percent
Onahu and similar soils: 25 percent
Rock outcrop: 20 percent
Minor components: 20 percent

Component Descriptions

Archrock soils
Landform: Mountains
Position on landform: Shoulders and summits
Parent material: Gravelly slope alluvium derived from schist, granite, and gneiss
Slope: 10 to 40 percent
Surface fragments: About 45 percent gravel, 20 percent cobbles, and 1 percent stones
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.2 inches (very low)
Shrink-swell potential: About 0.8 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Parry's Clover/Tufted Hairgrass
Potential native vegetation: alpine bluegrass, tufted hairgrass, Bellardi bog sedge, rock sedge, Parry's clover, alpine clover, alpine sagebrush, cinquefoil, avens
Land capability subclass (nonirrigated): 7e

Typical Profile:
A—0 to 8 inches; gravelly loam
Bw—8 to 18 inches; very gravelly loam

2BC—18 to 25 inches; very gravelly coarse sandy loam
2Cr—25 to 35 inches; weathered bedrock

Onahu soils

Landform: Glaciated mountain slopes and cirques
Position on landform: Footslopes, backslopes, and toeslopes
Parent material: Loamy alluvium over gravelly till derived from granite, gneiss, or schist
Slope: 10 to 25 percent
Surface fragments: About 10 percent cobbles, 7 percent stones, and 5 percent boulders
Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)
Drainage class: Poorly drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 0.8 percent (low)
Seasonal high water table depth: About 6 to 18 inches
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Diamondleaf Willow/Water Sedge
Potential native vegetation: tufted hairgrass, water sedge, diamondleaf willow, purple reedgrass, American bistort, alpine bluegrass, beaked sedge, cinquefoil, rock sedge, white marsh marigold
Land capability subclass (nonirrigated): 7e

Typical Profile:
A1—0 to 7 inches; loam
A2—7 to 16 inches; loam
2Bg—16 to 24 inches; very gravelly sandy loam
2Cg—24 to 45 inches; very gravelly sandy loam
3Cr—45 to 55 inches; weathered bedrock

Rock outcrop

Description: Rock outcrop consists of exposed granite, gneiss, and schist.
Landform: Mountains
Position on landform: Shoulders and summits
Parent material: Granite, gneiss, and schist
Slope: 15 to 75 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Runoff class: Very high
Land capability subclass (nonirrigated): 8s

Minor Components

Trailridge and similar soils
Composition: About 10 percent
Landform: Mountains
Position on landform: Backslopes and shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Mummy and similar soils
Composition: About 5 percent
Landform: Mountains

Position on landform: Backslopes and footslopes
Distinguishing characteristics: The Mummy soil depth is greater than 60 inches.

Rubble land and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Backslopes
Distinguishing characteristics: Rubble land has areas of accumulated cobbles, stones, and boulders (talus).

3—Bullwark-Catamount complex, 20 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,000 to 9,900 feet (2,438 to 3,018 meters)
Mean annual precipitation: 18 to 24 inches (460 to 610 millimeters)
Mean annual air temperature: 37 to 42 degrees F. (2.8 to 5.6 degrees C.)
Frost-free period: 50 to 70 days

Map Unit Composition

Bullwark and similar soils: 50 percent
Catamount and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Bullwark soils
Landform: Mountain slopes
Position on landform: Footslopes and backslopes
Parent material: Colluvium and residuum weathered from granite, gneiss, and schist
Slope: 20 to 50 percent
Surface fragments: About 10 percent gravel, 2 percent cobbles, and 1 percent stones
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 30 to 50 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 1.9 inches (very low)
Shrink-swell potential: About 0.8 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Elk Sedge
Potential native vegetation:
Common trees: Rocky Mountain Douglas-fir, lodgepole pine
Other plants: elk sedge, kinnikinnick, bluegrass, fivepetal cliffbush, common juniper, mountain goldenbanner
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oi—0 to 2 inches; slightly decomposed plant material
E—2 to 9 inches; very gravelly coarse sandy loam
E and Bt1—9 to 15 inches; very gravelly sandy loam

E and Bt2—15 to 23 inches; very cobbly sandy loam
Cr—23 to 32 inches; weathered bedrock
R—32 to 60 inches; unweathered bedrock

Catamount soils
Landform: Structural benches
Position on landform: Backslopes, shoulders, and summits
Parent material: Gravelly slope alluvium and residuum weathered from granite, schist, and gneiss
Slope: 20 to 50 percent
Surface fragments: About 5 percent gravel, 1 percent stones, and 1 percent cobbles
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 1.0 inch (very low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Kinnikinnick
Potential native vegetation:
Common trees: lodgepole pine, Rocky Mountain Douglas-fir
Other plants: kinnikinnick, sedge, Woods' rose, bluegrass, fivepetal cliffbush, currant, spike fescue, Oregongrape
Land capability subclass (nonirrigated): 7s

Typical Profile:
Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 3 inches; gravelly coarse sandy loam
Bw—3 to 10 inches; very gravelly coarse sandy loam
C—10 to 14 inches; very gravelly coarse sandy loam
Cr—14 to 24 inches; weathered bedrock

Minor Components
Granile and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Footslopes and backslopes
Distinguishing characteristics: The soil depth is greater than 60 inches and this component has a developed subsoil.

Legault and similar soils
Composition: About 5 percent
Landform: Structural benches
Position on landform: Summits, shoulders, and backslopes
Depth to restrictive feature: 5 to 20 inches to bedrock (paralithic)
Distinguishing characteristics: This minor component has more sand and less clay than the main component soils throughout the profile.

4—Catamount gravelly coarse sandy loam, 5 to 20 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,000 to 10,000 feet (2,438 to 3,048 meters)
Mean annual precipitation: 18 to 24 inches (457 to 610 millimeters)
Mean annual air temperature: 39 to 43 degrees F. (4.0 to 6.1 degrees C.)
Frost-free period: 50 to 70 days

Map Unit Composition

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

Component Descriptions

Catamount soils
Landform: Structural benches
Position on landform: Backslopes, shoulders, and summits
Parent material: Gravelly slope alluvium and residuum weathered from granite, schist, and gneiss
Slope: 5 to 20 percent
Surface fragments: About 5 percent gravel, 1 percent stones, and 1 percent cobbles
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 1.0 inch (very low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Kinnikinnick
Potential native vegetation:
Common trees: lodgepole pine, Rocky Mountain Douglas-fir
Other plants: Ross' sedge, kinnikinnick, Woods' rose, bluegrass, fivepetal cliffbush, common juniper, spike fescue, Oregongrape
Land capability subclass (nonirrigated): 7s

Typical Profile:
Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 3 inches; gravelly coarse sandy loam
Bw—3 to 10 inches; very gravelly coarse sandy loam
C—10 to 14 inches; very gravelly coarse sandy loam
Cr—14 to 24 inches; weathered bedrock

Minor Components
Legault and similar soils
Composition: About 5 percent
Landform: Structural benches
Position on landform: Summits and shoulders
Depth to restrictive feature: 5 to 20 inches to bedrock (paralithic)

Distinguishing characteristics: This minor component has more sand and less clay than the main component soils throughout the profile.

Rock outcrop and similar soils
Composition: About 5 percent
Landform: Structural benches
Position on landform: Summits and shoulders
Distinguishing characteristics: Rock outcrop has areas of exposed bedrock.

5—Catamount-Bullwark-Rock outcrop complex, 10 to 40 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,000 to 9,900 feet (2,438 to 3,018 meters)
Mean annual precipitation: 18 to 24 inches (457 to 610 millimeters)
Mean annual air temperature: 37 to 42 degrees F. (2.8 to 5.6 degrees C.)
Frost-free period: 50 to 70 days

Map Unit Composition

Catamount and similar soils: 45 percent
Bullwark and similar soils: 30 percent
Rock outcrop: 15 percent
Minor components: 10 percent

Component Descriptions

Catamount soils
Landform: Structural benches
Position on landform: Shoulders and backslopes
Parent material: Gravelly slope alluvium and residuum weathered from granite, schist, and gneiss
Slope: 10 to 40 percent
Surface fragments: About 10 percent gravel and 4 percent cobbles
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 1.0 inch (very low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Kinnikinnick
Potential native vegetation:
Common trees: lodgepole pine, Rocky Mountain Douglas-fir
Other plants: Ross' sedge, kinnikinnick, Woods' rose, bluegrass, fivepetal cliffbush, common juniper, spike fescue, mountain goldenbanner
Land capability subclass (nonirrigated): 7s

Typical Profile:
Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 3 inches; gravelly coarse sandy loam

Bw—3 to 10 inches; very gravelly coarse sandy loam
C—10 to 14 inches; very gravelly coarse sandy loam
Cr—14 to 24 inches; weathered bedrock

Bullwark soils
Landform: Mountain slopes
Position on landform: Footslopes and backslopes
Parent material: Colluvium and residuum weathered from granite, gneiss, and schist
Slope: 10 to 40 percent
Surface fragments: About 10 percent gravel, 2 percent cobbles, and 1 percent stones
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 30 to 50 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 1.9 inches (very low)
Shrink-swell potential: About 0.8 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Kinnikinnick
Potential native vegetation:
Common trees: Rocky Mountain Douglas-fir, lodgepole pine
Other plants: Ross' sedge, kinnikinnick, Woods' rose, bluegrass, fivepetal cliffbush, common juniper, spike fescue, mountain goldenbanner
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oi—0 to 2 inches; slightly decomposed plant material
E—2 to 9 inches; very gravelly coarse sandy loam
E and Bt1—9 to 15 inches; very gravelly sandy loam
E and Bt2—15 to 23 inches; very cobbly sandy loam
Cr—23 to 32 inches; weathered bedrock
R—32 to 60 inches; unweathered bedrock

Rock outcrop
Description: Rock outcrop consists of weathered escarpments and near vertical cliffs of exposed granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Summits and shoulders
Parent material: Granite, gneiss, and schist
Slope: 10 to 40 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Runoff class: Very high

Minor Components
Legault and similar soils
Composition: About 10 percent
Landform: Structural benches
Position on landform: Backslopes and shoulders
Depth to restrictive feature: 5 to 20 inches to bedrock (paralithic)
Distinguishing characteristics: This minor component has more sand and less clay than the main component soils throughout the profile.

6—Enentah very stony loam, 10 to 40 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,000 to 10,950 feet (2,743 to 3,337 meters)
Mean annual precipitation: 26 to 40 inches (660 to 1,016 millimeters)
Mean annual air temperature: 37 to 42 degrees F. (3.0 to 5.6 degrees C.)
Frost-free period: 20 to 50 days

Map Unit Composition

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

Component Descriptions

Enentah soils
Landform: Glaciated moraines and mountain slopes
Position on landform: Footslopes and backslopes
Parent material: Loamy colluvium and till derived from granite, gneiss, and schist
Slope: 10 to 40 percent
Surface fragments: About 25 percent cobbles, 2 percent boulders, and 2 percent stones
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Potential native vegetation:
Common trees: subalpine fir, Engelmann's spruce, lodgepole pine
Other plants: grouse whortleberry, dwarf blueberry, Ross' sedge, bluegrass, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
E—0 to 6 inches; very stony loam
Bs1—6 to 20 inches; very cobbly loam
Bs2—20 to 34 inches; extremely cobbly loam
Bw—34 to 56 inches; extremely cobbly sandy loam
BC—56 to 72 inches; extremely cobbly sandy loam

Minor Components
Fallriver and similar soils
Composition: About 10 percent
Landform: Mountain slopes and moraines
Position on landform: Backslopes
Distinguishing characteristics: This minor component is more acid than the main component soils throughout the profile.

Hiamovi and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Shoulders

7—Enentah-Rubble land complex, 25 to 70 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,000 to 11,000 feet (2,743 to 3,353 meters)
Mean annual precipitation: 26 to 40 inches (660 to 1,016 millimeters)
Mean annual air temperature: 37 to 41 degrees F. (3.0 to 5.0 degrees C.)
Frost-free period: 20 to 50 days

Map Unit Composition

Enentah and similar soils: 70 percent
Rubble land: 15 percent
Minor components: 15 percent

Component Descriptions

Enentah soils
Landform: Glaciated mountain slopes
Position on landform: Backslopes
Parent material: Loamy colluvium and till derived from granite, gneiss, and schist
Slope: 25 to 50 percent
Surface fragments: About 25 percent cobbles, 10 percent gravel, 2 percent boulders, and 2 percent stones
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Potential native vegetation:
Common trees: lodgepole pine, subalpine fir, Engelmann's spruce
Other plants: grouse whortleberry, dwarf blueberry, Ross' sedge, bluegrass, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
E—0 to 6 inches; very stony loam
Bs1—6 to 20 inches; very cobbly loam
Bs2—20 to 34 inches; extremely cobbly loam
Bw—34 to 56 inches; extremely cobbly sandy loam
BC—56 to 72 inches; extremely cobbly sandy loam

Rubble land
Description: Rubble land consists of areas of talus accumulations of granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Backslopes
Parent material: Granite, gneiss, and schist
Slope: 25 to 70 percent
Surface fragments: About 45 percent angular stones, 40 percent angular cobbles, and 5 percent angular boulders
Runoff class: Low
Land capability subclass (nonirrigated): 8

Minor Components
Fallriver and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes
Distinguishing characteristics: This minor component is more acid than the main component soils throughout the profile.

Hiamovi and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

Rock outcrop and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Distinguishing characteristics: This component has areas of exposed bedrock.

8—Fallriver gravelly sandy loam, 10 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,000 to 11,800 feet (2,743 to 3,597 meters)
Mean annual precipitation: 24 to 40 inches (610 to 1,016 millimeters)
Mean annual air temperature: 36 to 40 degrees F. (2.2 to 4.4 degrees C.)
Frost-free period: 20 to 50 days

Map Unit Composition

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

Component Descriptions

Fallriver soils
Landform: Glaciated mountain slopes and moraines
Position on landform: Backslopes and footslopes
Parent material: Colluvium and till derived from granite, gneiss, and schist
Slope: 10 to 45 percent
Surface fragments: About 1 percent stones and 1 percent cobbles
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)

Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Potential native vegetation:
Common trees: subalpine fir, Engelmann's spruce
Other plants: grouse whortleberry, dwarf blueberry, Ross' sedge, bluegrass, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 2 inches; moderately decomposed plant material
E—2 to 9 inches; gravelly sandy loam
Bs1—9 to 21 inches; very cobbly sandy loam
Bs2—21 to 35 inches; very cobbly sandy loam
BC—35 to 63 inches; very gravelly coarse sandy loam

Minor Components
Tonahutu and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and footslopes
Distinguishing characteristics: These soils have clay-enriched subsoils (lamellae).

Tileston and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and footslopes
Distinguishing characteristics: These soils have clay-enriched subsoils.

9—Fallriver gravelly sandy loam, warm, 10 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,000 to 11,800 feet (2,743 to 3,597 meters)
Mean annual precipitation: 24 to 40 inches (610 to 1,016 millimeters)
Mean annual air temperature: 36 to 40 degrees F. (2.2 to 4.4 degrees C.)
Frost-free period: 20 to 50 days

Map Unit Composition

Fallriver, warm and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Fallriver, warm soils
Landform: Glaciated mountain slopes and moraines
Position on landform: Backslopes and footslopes
Parent material: Colluvium and till derived from granite, gneiss, and schist

Slope: 10 to 45 percent
Surface fragments: About 1 percent stones and 1 percent cobbles
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Grouse Whortleberry
Potential native vegetation:
Common trees: Engelmann's spruce, subalpine fir, lodgepole pine
Other plants: grouse whortleberry, kinnikinnick, Ross' sedge, Woods' rose, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 2 inches; moderately decomposed plant material
E—2 to 9 inches; gravelly sandy loam
Bs1—9 to 21 inches; very cobbly sandy loam
Bs2—21 to 35 inches; very cobbly sandy loam
BC—35 to 63 inches; very gravelly coarse sandy loam

Minor Components
Enentah and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and footslopes
Distinguishing characteristics: This minor component is less acid than the main component soils throughout the profile.

Hiamovi and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

10—Fallriver-Hiamovi complex, 10 to 55 percent slopes

Map Unit Setting

Major Land Resource Area: 48A (fig. 3)
Elevation: 9,000 to 11,800 feet (2,743 to 3,597 meters)
Mean annual precipitation: 26 to 40 inches (660 to 1,016 millimeters)
Mean annual air temperature: 36 to 40 degrees F. (2.2 to 4.5 degrees C.)
Frost-free period: 20 to 50 days

Map Unit Composition

Fallriver and similar soils: 50 percent
Hiamovi and similar soils: 30 percent
Minor components: 20 percent

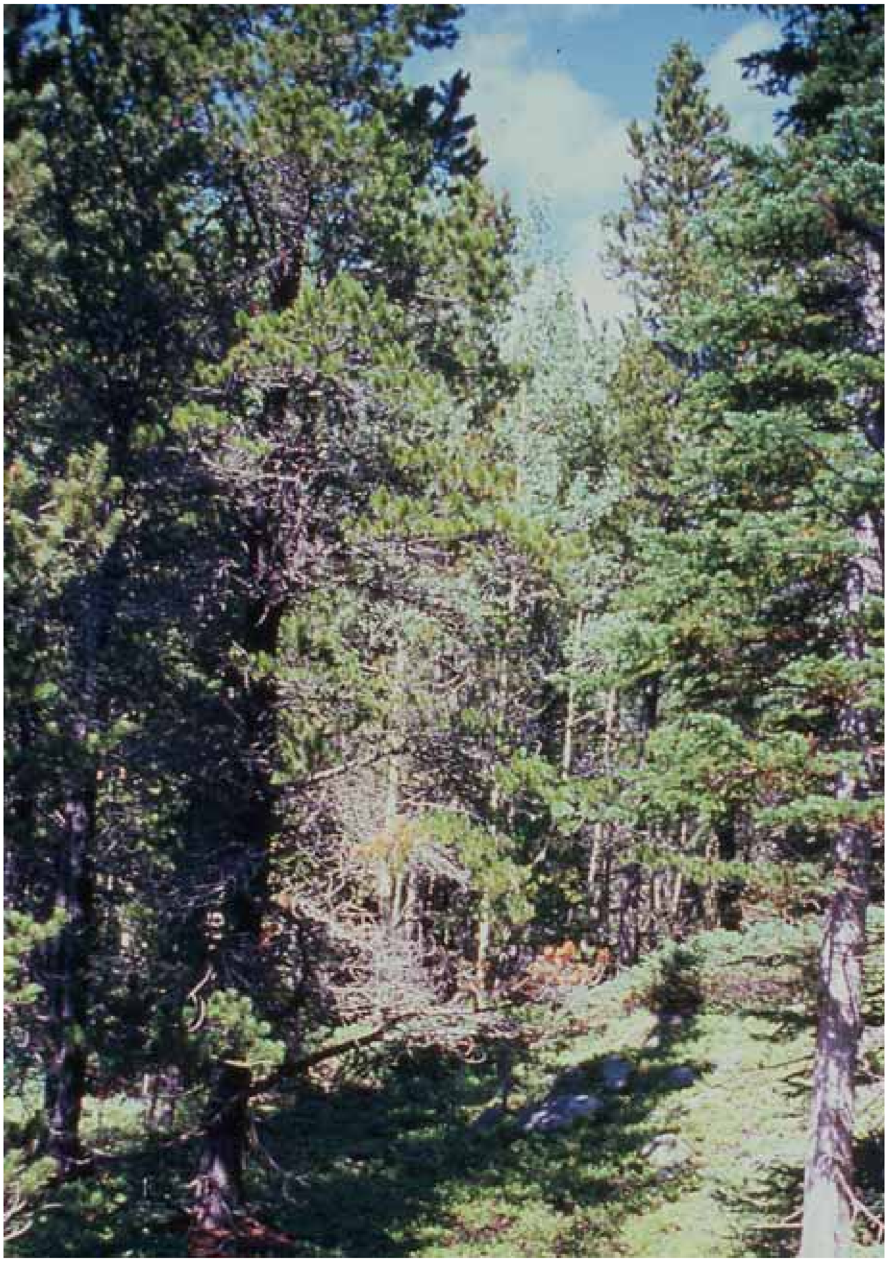

Figure 3.—**Lodgepole pine stand in an area of map unit 10-Fallriver-Hiamovi complex, 10 to 55 percent slopes, in a Subalpine Life Zone.**

Component Descriptions

Fallriver soils

Landform: Glaciated mountain slopes and moraines
Position on landform: Backslopes and footslopes
Parent material: Colluvium and till derived from granite, gneiss, and schist
Slope: 10 to 55 percent
Surface fragments: About 1 percent stones and 1 percent cobbles
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 3.9 inches (low)

Shrink-swell potential: About 0.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Potential native vegetation:
Common trees: Engelmann's spruce, subalpine fir
Other plants: grouse whortleberry, dwarf blueberry, Ross' sedge, bluegrass, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 2 inches; moderately decomposed plant material
E—2 to 9 inches; gravelly sandy loam
Bs1—9 to 21 inches; very cobbly sandy loam
Bs2—21 to 35 inches; very cobbly sandy loam
BC—35 to 63 inches; very gravelly coarse sandy loam

Hiamovi soils
Landform: Glaciated mountain slopes
Position on landform: Shoulders and backslopes
Parent material: Gravelly till and residuum weathered from granite, gneiss, and schist
Slope: 20 to 55 percent
Surface fragments: About 10 percent stones, 10 percent boulders, 3 percent cobbles, and 2 percent gravel
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Grouse Whortleberry
Potential native vegetation:
Common trees: lodgepole pine, subalpine fir, Engelmann's spruce
Other plants: grouse whortleberry, common juniper, Ross' sedge, bluegrass, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
E—0 to 5 inches; extremely gravelly sandy loam
Bw—5 to 13 inches; extremely gravelly sandy loam
R—13 to 60 inches; unweathered bedrock

Minor Components
Rock outcrop and similar soils
Composition: About 8 percent
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Distinguishing characteristics: Rock outcrop has areas of exposed bedrock.

Enentah and similar soils
Composition: About 7 percent
Landform: Mountain slopes
Position on landform: Backslopes and footslopes
Distinguishing characteristics: This minor component is less acid than the main component soils throughout the profile.

Bullwark and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 30 to 50 inches to bedrock (lithic)

11—Fallriver-Rock outcrop complex, 30 to 70 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,000 to 11,800 feet (2,743 to 3,597 meters)
Mean annual precipitation: 24 to 40 inches (610 to 1,016 millimeters)
Mean annual air temperature: 36 to 40 degrees F. (2.2 to 4.4 degrees C.)
Frost-free period: 20 to 50 days

Map Unit Composition

Fallriver and similar soils: 60 percent
Rock outcrop: 25 percent
Minor components: 15 percent

Component Descriptions

Fallriver soils
Landform: Glaciated mountain slopes and moraines
Position on landform: Backslopes and footslopes
Parent material: Colluvium and till derived from granite, gneiss, and schist
Slope: 30 to 55 percent
Surface fragments: About 1 percent stones and 1 percent cobbles
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Potential native vegetation:
Common trees: Engelmann's spruce, subalpine fir, lodgepole pine
Other plants: grouse whortleberry, dwarf blueberry, Ross' sedge, bluegrass, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 2 inches; moderately decomposed plant material
E—2 to 9 inches; gravelly sandy loam
Bs1—9 to 21 inches; very cobbly sandy loam
Bs2—21 to 35 inches; very cobbly sandy loam
BC—35 to 63 inches; very gravelly coarse sandy loam

Rock outcrop
Description: Rock outcrop consists of exposed granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Parent material: granite, gneiss, and schist
Slope: 30 to 70 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Runoff class: Very high

Minor Components
Rubble land and similar soils
Composition: About 10 percent
Landform: Mountain slopes
Position on landform: Backslopes
Distinguishing characteristics: Rubble land has areas of accumulated cobbles, stones, and boulders (talus).

Hiamovi and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

12—Galuche-Rock outcrop complex, 20 to 90 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 7,800 to 9,800 feet (2,378 to 2,987 meters)
Mean annual precipitation: 16 to 22 inches (406 to 559 millimeters)
Mean annual air temperature: 42 to 46 degrees F. (5.6 to 7.8 degrees C.)
Frost-free period: 75 to 95 days

Map Unit Composition

Galuche and similar soils: 55 percent
Rock outcrop: 30 percent
Minor components: 15 percent

Component Descriptions

Galuche soils
Landform: Mountain slopes
Position on landform: Backslopes, shoulders, and summits
Parent material: Slope alluvium and gravelly residuum weathered from granite, gneiss, and schist
Slope: 20 to 90 percent

Surface fragments: About 8 percent stones, 7 percent cobbles, and 5 percent gravel
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 1.3 inches (very low)
Shrink-swell potential: About 0.8 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Ponderosa Pine-Rocky Mountain Douglas Fir/Mountain Muhly
Potential native vegetation:
Common trees: ponderosa pine, lodgepole pine, Rocky Mountain Douglas-fir
Other plants: Ross' sedge, mountain muhly, kinnikinnick, spike fescue, bluegrass, fivepetal cliffbush, prairie Junegrass, prairie sagewort
Land capability subclass (nonirrigated): 8

Typical Profile:
Oe—0 to 1 inch; moderately decomposed plant material
A—1 inch to 3 inches; very gravelly sandy loam
E—3 to 9 inches; very gravelly sandy loam
Bw—9 to 19 inches; very gravelly sandy loam
R—19 to 60 inches; unweathered bedrock

Rock outcrop
Description: Rock outcrop consists of near-vertical cliffs and escarpments of exposed granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Backslopes and summits
Parent material: Granite, gneiss, and schist
Slope: 20 to 90 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Runoff class: Very high
Land capability subclass (nonirrigated): 8s

Minor Components
Cathedral and similar soils
Composition: About 10 percent
Landform: Mountain slopes
Position on landform: Backslopes and footslopes
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Distinguishing characteristics: This component has a dark surface layer.

Chasmfalls and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and footslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

13—Granile very gravelly coarse sandy loam, 30 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,000 to 10,000 feet (2,438 to 3,048 meters)
Mean annual precipitation: 20 to 24 inches (508 to 610 millimeters)
Mean annual air temperature: 38 to 41 degrees F. (3.3 to 5.0 degrees C.)
Frost-free period: 50 to 70 days

Map Unit Composition

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

Component Descriptions

Granile soils
Landform: Mountain slopes
Position on landform: Backslopes
Parent material: Colluvium derived from gneiss, granite, and schist
Slope: 30 to 60 percent
Surface fragments: About 5 percent cobbles, 2 percent boulders, and 2 percent stones
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 5.1 inches (low)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine-Common Juniper
Potential native vegetation:
Common trees: Rocky Mountain Douglas-fir, lodgepole pine, Engelmann's spruce
Other plants: bluegrass, elk sedge, common juniper, heartleaf arnica, kinnikinnick, mountain goldenbanner, wintergreen
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 3 inches; moderately decomposed plant material
E—3 to 8 inches; very gravelly coarse sandy loam
E/B—8 to 21 inches; extremely gravelly coarse sandy loam
Bt—21 to 43 inches; very gravelly sandy clay loam
BC—43 to 65 inches; very gravelly sandy clay loam

Minor Components
Bullwark and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 30 to 50 inches to bedrock (lithic)

Catamount and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Nanita and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes
Distinguishing characteristics: This minor component does not have a clay-enriched subsoil, and has more sand and less clay than the main component soils throughout the profile.

14—Hiamovi-Rock outcrop complex, 5 to 40 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,900 to 12,000 feet (3,018 to 3,658 meters)
Mean annual precipitation: 26 to 40 inches (660 to 1,016 millimeters)
Mean annual air temperature: 36 to 39 degrees F. (2.2 to 4.0 degrees C.)
Frost-free period: 15 to 40 days

Map Unit Composition

Hiamovi and similar soils: 55 percent
Rock outcrop: 30 percent
Minor components: 15 percent

Component Descriptions

Hiamovi soils
Landform: Glaciated mountain slopes
Position on landform: Shoulders and summits
Parent material: Gravelly slope alluvium and residuum weathered from granite, gneiss, and schist
Slope: 5 to 40 percent
Surface fragments: About 15 percent cobbles, 15 percent stones, and 5 percent gravel
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Limber Pine/Common Juniper
Potential native vegetation:
Common trees: lodgepole pine, limber pine, Engelmann's spruce
Other plants: grouse whortleberry, sedge, common juniper, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
E—0 to 5 inches; extremely gravelly sandy loam
Bw—5 to 13 inches; extremely gravelly sandy loam
R—13 to 60 inches; unweathered bedrock

Rock outcrop
Description: Rock outcrop consists of exposed granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Backslopes
Parent material: Granite, gneiss, and schist
Slope: 5 to 40 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Runoff class: Very high

Minor Components
Trailridge and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Summits and shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Distinguishing characteristics: This component has a dark surface layer.

Archrock and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Shoulders and summits
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Mummy and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes
Distinguishing characteristics: The Mummy soil depth is greater than 60 inches.

15—Hiamovi-Rock outcrop complex, 15 to 80 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,000 to 11,000 feet (2,743 to 3,353 meters)
Mean annual precipitation: 26 to 40 inches (660 to 1,016 millimeters)
Mean annual air temperature: 36 to 42 degrees F. (2.2 to 5.6 degrees C.)
Frost-free period: 10 to 50 days

Map Unit Composition

Hiamovi and similar soils: 50 percent
Rock outcrop: 30 percent
Minor components: 20 percent

Component Descriptions

Hiamovi soils
Landform: Glaciated mountain slopes
Position on landform: Shoulders and backslopes
Parent material: Gravelly slope alluvium and residuum weathered from granite, gneiss, and schist
Slope: 15 to 65 percent
Surface fragments: About 5 percent boulders, 2 percent cobbles, and 2 percent stones
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 0.4 inch (very low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Grouse Whortleberry
Potential native vegetation:
Common trees: lodgepole pine, subalpine fir, Engelmann's spruce
Other plants: elk sedge, grouse whortleberry, common juniper, Ross' sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
E—0 to 5 inches; extremely gravelly sandy loam
Bw—5 to 13 inches; extremely gravelly sandy loam
R—13 to 60 inches; unweathered bedrock

Rock outcrop
Description: Rock outcrop consists of weathered escarpments and near vertical cliffs of exposed granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Parent material: Granite, gneiss, and schist
Slope: 15 to 80 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Runoff class: Very high

Minor Components
Fallriver and similar soils
Composition: About 10 percent
Landform: Mountain slopes
Position on landform: Backslopes and footslopes
Distinguishing characteristics: The Fallriver soil depth is greater than 60 inches.

Catamount and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Legault and similar soils

Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Depth to restrictive feature: 5 to 20 inches to bedrock (paralithic)
Distinguishing characteristics: This minor component has more sand and less clay than the main component soils throughout the profile.

16—Isolation gravelly sandy loam, 5 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,000 to 9,000 feet (2,438 to 2,743 meters)
Mean annual precipitation: 16 to 22 inches (407 to 559 millimeters)
Mean annual air temperature: 41 to 44 degrees F. (5.0 to 6.7 degrees C.)
Frost-free period: 70 to 100 days

Map Unit Composition

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

Component Descriptions

Isolation soils
Landform: Moraines
Position on landform: Shoulders, footslopes, and backslopes
Parent material: Sandy and gravelly till derived from granite, gneiss, and schist
Slope: 5 to 35 percent
Surface fragments: About 25 percent gravel, 5 percent cobbles, and 2 percent stones
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.8 inches (very low)
Shrink-swell potential: About 0.3 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Ponderosa Pine/Mountain Muhly
Potential native vegetation:
Common trees: ponderosa pine
Other plants: mountain muhly, needleandthread, Parry's oatgrass, spike fescue, Ross' sedge, antelope bitterbrush, blue grama, bluegrass, currant, prairie Junegrass
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oi—0 to 1 inch; slightly decomposed plant material
A1—1 inch to 6 inches; gravelly sandy loam
A2—6 to 11 inches; very gravelly sandy loam
E and Bt—11 to 24 inches; extremely cobbly sandy loam
B/Et—24 to 33 inches; extremely gravelly sandy loam
2BC—33 to 39 inches; extremely gravelly coarse sand

2C—39 to 51 inches; very gravelly coarse sand
3C—51 to 72 inches; loamy coarse sand

Minor Components

Isolation, nonstony surface and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Backslopes, footslopes, and shoulders
Distinguishing characteristics: This minor component does not have rock fragments on the surface.

Lumpyridge and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Toeslopes and footslopes
Distinguishing characteristics: This minor component has fewer rock fragments than the main component soils throughout the profile.

17—Kawuneeche loam, 0 to 1 percent slopes

Map Unit Setting

Major Land Resource Area: 48A (fig. 4)
Elevation: 8,000 to 9,000 feet (2,438 to 2,743 meters)
Mean annual precipitation: 18 to 24 inches (457 to 610 millimeters)
Mean annual air temperature: 36 to 42 degrees F. (2.2 to 5.6 degrees C.)
Frost-free period: 50 to 75 days

Figure 4.—Horseshoe Park contains an area of map unit 17-Kawuneeche loam, 0 to 1 percent slopes, in a Riparian Life Zone.

Map Unit Composition

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

Component Descriptions

Kawuneeche soils
Landform: Flood plains
Parent material: Alluvium over sandy and gravelly glaciofluvial deposits derived from granite, gneiss, and schist
Slope: 0 to 1 percent
Surface fragments: About 8 percent gravel
Drainage class: Poorly drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 3.4 inches (low)
Shrink-swell potential: About 0.1 percent (low)
Flooding hazard: Occasional
Seasonal high water table depth: About 12 to 18 inches
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Tufted Hairgrass/Sedge Sp.
Potential native vegetation: tufted hairgrass, Nebraska sedge, bluejoint, rush, American mannagrass, alpine timothy, bluegrass, shrubby cinquefoil, water sedge, western wheatgrass
Land capability subclass (nonirrigated): 6w

Typical Profile:
A1—0 to 6 inches; loam
A2—6 to 12 inches; loam
Bg—12 to 20 inches; gravelly sandy loam
Cg1—20 to 35 inches; gravelly loamy fine sand
2Cg2—35 to 61 inches; extremely gravelly coarse sand

Minor Components
Kawaneeche mucky peat and similar soils
Composition: About 5 percent
Landform: Flood plains
Drainage class: Poorly drained
Flooding hazard: Occasional
Distinguishing characteristics: This component has an organic layer on the surface.

Lumpyridge and similar soils
Composition: About 5 percent
Landform: Fans
Position on landform: Footslopes
Distinguishing characteristics: This component does not have a water table.

18—Kawuneeche mucky peat, 0 to 4 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,000 to 9,000 feet (2,438 to 2,743 meters)
Mean annual precipitation: 24 to 32 inches (610 to 813 millimeters)
Mean annual air temperature: 36 to 42 degrees F. (2.2 to 5.6 degrees C.)
Frost-free period: 40 to 60 days

Map Unit Composition

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

Component Descriptions

Kawuneeche soils
Landform: Flood plains
Parent material: Alluvium over sandy and gravelly glaciofluvial deposits derived from granite, gneiss, and schist
Slope: 0 to 4 percent
Surface fragments: About 5 percent gravel
Drainage class: Poorly drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 5.9 inches (low)
Shrink-swell potential: About 0.1 percent (low)
Flooding hazard: Frequent
Seasonal high water table depth: About 0 to 18 inches
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Diamondleaf Willow/Water Sedge
Potential native vegetation: tufted hairgrass, water sedge, American mannagrass, bluegrass, rush, cinquefoil, grayleaf willow, diamondleaf willow, white marsh marigold
Land capability subclass (nonirrigated): 6w

Typical Profile:
Oe—0 to 5 inches; mucky peat
A—5 to 12 inches; clay loam
Bg—12 to 23 inches; loam
Cg1—23 to 31 inches; coarse sandy loam
2Cg2—31 to 66 inches; very gravelly loamy sand

Minor Components
Venable and similar soils
Composition: About 5 percent
Landform: Flood plains
Drainage class: Poorly drained
Flooding hazard: Occasional
Distinguishing characteristics: This minor component has more clay and less acid than the main component soils throughout the profile.

Humic Dystrocryepts and similar soils

Composition: About 5 percent
Landform: Fans
Position on landform: Footslopes
Flooding hazard: Rare
Distinguishing characteristics: This minor component is deeper to a seasonal high water table than the main component soils throughout the profile.

19—Kawuneeche mucky peat, low precipitation, 0 to 1 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,000 to 8,600 feet (2,438 to 2,621 meters)
Mean annual precipitation: 18 to 24 inches (457 to 610 millimeters)
Mean annual air temperature: 36 to 42 degrees F. (2.2 to 5.6 degrees C.)
Frost-free period: 50 to 75 days

Map Unit Composition

Kawuneeche, low precipitation and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Kawuneeche, low precipitation soils
Landform: Flood plains
Parent material: Alluvium over sandy and gravelly glaciofluvial deposits derived from granite, gneiss, and schist
Slope: 0 to 1 percent
Surface fragments: About 5 percent gravel
Drainage class: Poorly drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 6.0 inches (low)
Shrink-swell potential: About 0.1 percent (low)
Flooding hazard: Frequent
Seasonal high water table depth: About 0 to 18 inches
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Diamondleaf Willow/Water Sedge
Potential native vegetation: water sedge, American mannagrass, Baltic rush, bluegrass, diamondleaf willow, tufted hairgrass, mountain rush, rush, shrubby cinquefoil, slender wheatgrass
Land capability subclass (nonirrigated): 6w

Typical Profile:
Oe—0 to 5 inches; mucky peat
A—5 to 12 inches; clay loam
Bg—12 to 23 inches; loam
Cg1—23 to 31 inches; coarse sandy loam
2Cg2—31 to 66 inches; very gravelly loamy sand

Minor Components

Kawaneeche loam and similar soils

Composition: About 9 percent
Landform: Flood plains
Drainage class: Somewhat poorly drained
Flooding hazard: Occasional
Distinguishing characteristics: This minor component is deeper to a seasonal high water table than the main component soils throughout the profile, and does not have an organic layer on the surface.

Venable and similar soils

Composition: About 1 percent
Landform: Flood plains
Flooding hazard: Occasional
Distinguishing characteristics: This minor component has more clay and less acid than the main component soils throughout the profile.

20—Kawuneeche-Dystrocryepts complex, 1 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,500 to 10,700 feet (2,591 to 3.262 meters)
Mean annual precipitation: 24 to 40 inches (610 to 1,016 millimeters)
Mean annual air temperature: 36 to 40 degrees F. (2.2 to 4.4 degrees C.)
Frost-free period: 40 to 60 days

Map Unit Composition

Kawuneeche and similar soils: 50 percent
Dystrocryepts and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Kawuneeche soils
Landform: Flood plains
Position on landform: Toeslopes
Parent material: Alluvium over sandy and gravelly glaciofluvial deposits derived from granite, gneiss, and schist
Slope: 1 to 4 percent
Surface fragments: About 1 percent stones and 1 percent cobbles
Drainage class: Poorly drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 5.9 inches (low)
Shrink-swell potential: About 0.1 percent (low)
Flooding hazard: Frequent
Seasonal high water table depth: About 0 to 18 inches
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Diamondleaf Willow/Water Sedge

Potential native vegetation: tufted hairgrass, water sedge, American mannagrass, rush, bluegrass, cinquefoil, grayleaf willow, diamondleaf willow, white marsh marigold
Land capability subclass (nonirrigated): 6w

Typical Profile:
Oe—0 to 5 inches; mucky peat
A—5 to 12 inches; clay loam
Bg—12 to 23 inches; loam
Cg1—23 to 31 inches; coarse sandy loam
2Cg2—31 to 66 inches; very gravelly loamy sand

Dystrocryepts soils
Landform: Drainageways
Position on landform: Footslopes
Parent material: Alluvium derived from granite, schist, and gneiss
Slope: 5 to 15 percent
Surface fragments: About 1 percent cobbles, about 1 percent stones
Drainage class: Moderately well drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 6.0 inches (moderate)
Shrink-swell potential: About 0.8 percent (low)
Flooding hazard: Rare
Seasonal high water table depth: About 24 to 60 inches
Runoff class: Low
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Tufted Hairgrass/ Sedge Sp.
Potential native vegetation: tufted hairgrass, Nebraska sedge, bluegrass, rush, American mannagrass, alpine timothy, bluejoint, shrubby cinquefoil, water sedge, western wheatgrass
Land capability subclass (nonirrigated): 6e

Typical Profile:
A—0 to 8 inches; loam
Bw1—8 to 20 inches; loam
Bw2—20 to 30 inches; loam
2BC—30 to 60 inches; very gravelly sandy loam

Minor Components
Venable and similar soils
Composition: About 5 percent
Landform: Flood plains
Position on landform: Toeslopes
Drainage class: Poorly drained
Flooding hazard: Occasional
Distinguishing characteristics: This minor component has more clay and less acid than the main component soils throughout the profile.

Terric Cryofibrists and similar soils
Composition: About 5 percent
Landform: Flood plains

Position on landform: Toeslopes
Drainage class: Poorly drained
Flooding hazard: Occasional
Distinguishing characteristics: This component has a thick organic layer.

21—Legault very gravelly sandy loam, 15 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,500 to 10,000 feet (2,591 to 3,048 meters)
Mean annual precipitation: 18 to 24 inches (457 to 610 millimeters)
Mean annual air temperature: 37 to 41 degrees F. (2.8 to 5.0 degrees C.)
Frost-free period: 50 to 75 days

Map Unit Composition

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

Component Descriptions

Legault soils
Landform: Mountain slopes and structural benches
Position on landform: Backslopes and shoulders
Parent material: Sandy and gravelly slope alluvium over residuum weathered from granite, gneiss, and schist
Slope: 15 to 45 percent
Surface fragments: About 12 percent gravel
Depth to restrictive feature: 5 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 6.0 to 20 in./hr. (rapid)
Available water capacity: About 0.6 inch (very low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Kinnikinnick
Potential native vegetation:
Common trees: Rocky Mountain Douglas-fir, lodgepole pine
Other plants: Ross' sedge, kinnikinnick, bluegrass, fivepetal cliffbush, common juniper, mountain goldenbanner, spike fescue, Woods' rose
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 3 inches; very gravelly sandy loam
E—3 to 8 inches; extremely gravelly loamy sand
EB—8 to 12 inches; extremely gravelly loamy sand
Cr—12 to 22 inches; weathered bedrock

Minor Components

Rock outcrop and similar soils

Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Distinguishing characteristics: Rock outcrop has areas of exposed bedrock.

Bullwark and similar soils

Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 30 to 50 inches to bedrock (lithic)

22—Lumpyridge gravelly coarse sandy loam, 1 to 6 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 7,500 to 8,700 feet (2,286 to 2,652 meters)
Mean annual precipitation: 16 to 22 inches (406 to 560 millimeters)
Mean annual air temperature: 43 to 46 degrees F. (6.0 to 7.8 degrees C.)
Frost-free period: 70 to 100 days

Map Unit Composition

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

Component Descriptions

Lumpyridge soils
Landform: Fans
Parent material: Coarse-loamy alluvium derived from granite, gneiss, and schist
Slope: 1 to 6 percent
Surface fragments: About 10 percent gravel
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 4.5 inches (low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: Low
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Needleandthread/Mountain Muhly
Potential native vegetation: mountain muhly, needleandthread, Parry’s oatgrass, western wheatgrass, prairie Junegrass, prairie sagewort, slender wheatgrass, antelope bitterbrush, ponderosa pine
Land capability subclass (nonirrigated): 4e

Typical Profile:
A1—0 to 6 inches; gravelly coarse sandy loam
A2—6 to 11 inches; gravelly sandy loam
Bt1—11 to 25 inches; gravelly sandy loam

Bt2—25 to 39 inches; gravelly sandy clay loam
2BC—39 to 45 inches; very gravelly coarse sandy loam
2C—45 to 80 inches; very gravelly loamy coarse sand

Minor Components
Venable and similar soils
Composition: About 5 percent
Landform: Depressions
Position on landform: Toeslopes
Flooding hazard: Rare
Distinguishing characteristics: This minor component has a seasonal high water table.

Isolation and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Backslopes
Distinguishing characteristics: This minor component contains more rock fragments than the main component soils.

23—Lumpyridge-Rofork complex, 3 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 7,500 to 8,700 feet (2,286 to 2,652 meters)
Mean annual precipitation: 16 to 22 inches (406 to 560 millimeters)
Mean annual air temperature: 42 to 46 degrees F. (5.6 to 7.8 degrees C.)
Frost-free period: 70 to 100 days

Map Unit Composition

Lumpyridge and similar soils: 60 percent
Rofork and similar soils: 25 percent
Minor components: 15 percent

Component Descriptions

Lumpyridge soils
Landform: Fans
Parent material: Coarse-loamy alluvium derived from granite, gneiss, and schist
Slope: 3 to 15 percent
Surface fragments: About 10 percent gravel
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 4.5 inches (low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Needleandthread/Mountain Muhly

Potential native vegetation:
Common trees: ponderosa pine
Other plants: mountain muhly, needleandthread, Arizona fescue, Parry's oatgrass, antelope bitterbrush, ponderosa pine, prairie Junegrass, prairie sagewort, slender wheatgrass, western wheatgrass
Land capability subclass (nonirrigated): 6e

Typical Profile:
A1—0 to 6 inches; gravelly coarse sandy loam
A2—6 to 11 inches; gravelly sandy loam
Bt1—11 to 25 inches; gravelly sandy loam
Bt2—25 to 39 inches; gravelly sandy clay loam
2BC—39 to 45 inches; very gravelly coarse sandy loam
2C—45 to 80 inches; very gravelly loamy coarse sand

Rofork soils
Landform: Structural benches
Position on landform: Summits, shoulders, and backslopes
Parent material: Gravelly slope alluvium and residuum weathered from granite, gneiss, and schist
Slope: 5 to 15 percent
Surface fragments: About 5 percent gravel and 1 percent cobbles
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 0.7 inch (very low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Ponderosa Pine/Antelope Bitterbrush
Potential native vegetation:
Common trees: ponderosa pine
Other plants: mountain muhly, needleandthread, Parry's oatgrass, prairie Junegrass, antelope bitterbrush, blue grama, bluegrass, mountain big sagebrush, mountain goldenbanner, ponderosa pine, wheatgrass
Land capability subclass (nonirrigated): 7e

Typical Profile:
A—0 to 5 inches; very gravelly sandy loam
Bw—5 to 10 inches; very gravelly sandy loam
C—10 to 14 inches; extremely gravelly loamy coarse sand
Cr—14 to 24 inches; weathered bedrock

Minor Components
Chasmfalls and similar soils
Composition: About 5 percent
Landform: Fans
Position on landform: Toeslopes and footslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Kawuneeche and similar soils
Composition: About 5 percent
Landform: Flood plains
Position on landform: Toeslopes
Flooding hazard: Frequent
Distinguishing characteristics: This minor component has a seasonal high water table.

Cathedral and similar soils
Composition: About 5 percent
Landform: Structural benches
Position on landform: Summits, shoulders, and backslopes
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Distinguishing characteristics: This minor component has a dark surface layer.

24—Mummy extremely cobbly sandy loam, 20 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 48A (fig. 5)
Elevation: 10,400 to 12,200 feet (3,170 to 3,719 meters)
Mean annual precipitation: 30 to 40 inches (762 to 1,016 millimeters)
Mean annual air temperature: 34 to 38 degrees F. (1.1 to 3.3 degrees C.)
Frost-free period: 10 to 30 days

Map Unit Composition

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

Component Descriptions

Mummy soils
Landform: Glaciated mountains
Position on landform: Footslopes and backslopes
Parent material: Colluvium and till derived from granite, gneiss, and schist
Slope: 20 to 50 percent
Surface fragments: About 30 percent cobbles, 15 percent stones, and 5 percent boulders
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.5 inches (very low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Bellardi Bog Sedge/Avens/Rock Sedge
Potential native vegetation: Bellardi bog sedge, tufted hairgrass, alpine bluegrass, avens, rock sedge, American bistort, alpine clover, cinquefoil, purple reedgrass
Land capability subclass (nonirrigated): 7e

Figure 5.—On the upper part of Specimen Mountain is an area of map unit 24-Mummy extremely cobbly sandy loam, 20 to 50 percent slopes, in an Alpine Life Zone. The foreground shows map unit 1-Archrock-Fallriver association, 15 to 50 percent slopes, in an Alpine Life Zone.

Typical Profile:
A—0 to 5 inches; extremely cobbly sandy loam
Bw1—5 to 24 inches; extremely cobbly sandy loam
Bw2—24 to 72 inches; extremely cobbly sandy loam

Minor Components

Archrock and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Shoulders and backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Trailridge and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Summits and shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Rock outcrop and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Shoulders and backslopes
Distinguishing characteristics: This component has areas of exposed bedrock.

25—Mummy gravelly sandy loam, 10 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 10,400 to 12,200 feet (3,170 to 3,719 meters)
Mean annual precipitation: 30 to 40 inches (762 to 1,016 millimeters)
Mean annual air temperature: 34 to 38 degrees F. (1.1 to 3.3 degrees C.)
Frost-free period: 10 to 30 days

Map Unit Composition

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

Component Descriptions

Mummy soils
Landform: Glaciated mountains
Position on landform: Footslopes and backslopes
Parent material: Colluvium and till derived from granite, gneiss, and schist
Slope: 10 to 35 percent
Surface fragments: About 5 percent gravel, 2 percent cobbles, and 1 percent stones
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 4.6 inches (low)
Shrink-swell potential: About 0.8 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Bellardi Bog Sedge/Avens/Rock Sedge
Potential native vegetation: Bellardi bog sedge, tufted hairgrass, alpine bluegrass, avens, rock sedge, American bistort, alpine clover, cinquefoil, purple reedgrass
Land capability subclass (nonirrigated): 7e

Typical Profile:
A—0 to 10 inches; gravelly sandy loam
Bw1—10 to 21 inches; very gravelly sandy loam
Bw2—21 to 63 inches; very gravelly sandy loam

Minor Components
Archrock and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Shoulders and backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Trailridge and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Shoulders and summits
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Rock outcrop and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Shoulders and backslopes
Distinguishing characteristics: This minor component has areas of exposed bedrock.

26—Nanita extremely gravelly loamy coarse sand, 30 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,020 to 10,000 feet (2,750 to 3,048 meters)
Mean annual precipitation: 20 to 24 inches (508 to 610 millimeters)
Mean annual air temperature: 37 to 42 degrees F. (3.0 to 5.6 degrees C.)
Frost-free period: 40 to 60 days

Map Unit Composition

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

Component Descriptions

Nanita soils
Landform: Glaciated mountain slopes
Position on landform: Backslopes
Parent material: Sandy and gravelly till and colluvium derived from schist, granite, and gneiss
Slope: 30 to 60 percent
Surface fragments: About 5 percent stones and 1 percent cobbles
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 1.5 inches (very low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Elk Sedge
Potential native vegetation:
Common trees: Rocky Mountain Douglas-fir, lodgepole pine, Engelmann's spruce
Other plants: elk sedge, common juniper, kinnikinnick, fivepetal cliffbush, heartleaf arnica, mountain goldenbanner, Woods' rose, Oregongrape
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oi—0 to 1 inch; slightly decomposed plant material
E1—1 inch to 2 inches; extremely gravelly loamy coarse sand
E2—2 to 7 inches; extremely gravelly loamy sand
E and Bt1—7 to 18 inches; extremely gravelly loamy sand
E and Bt2—18 to 72 inches; extremely gravelly loamy sand

Minor Components
Bullwark and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 30 to 50 inches to bedrock (lithic)

Legault and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Shoulders
Depth to restrictive feature: 5 to 20 inches to bedrock (paralithic)

Rock outcrop and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Shoulders
Distinguishing characteristics: This minor component has areas of exposed bedrock.

27—Nanita very gravelly sandy loam, 1 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,200 to 9,020 feet (2,500 to 2,750 meters)
Mean annual precipitation: 20 to 24 inches (508 to 610 millimeters)
Mean annual air temperature: 36 to 42 degrees F. (2.2 to 5.6 degrees C.)
Frost-free period: 50 to 70 days

Map Unit Composition

Nanita and similar soils: 100 percent

Component Descriptions

Nanita soils
Landform: Moraines
Position on landform: Shoulders and summits
Parent material: Sandy and gravelly till derived from schist, granite, and gneiss
Slope: 1 to 15 percent
Surface fragments: About 5 percent gravel, 3 percent stones, and 1 percent cobbles
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 1.9 inches (very low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: Low
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Elk Sedge

Potential native vegetation:
Common trees: Engelmann’s spruce, lodgepole pine, Rocky Mountain Douglas-fir
Other plants: elk sedge, common juniper, kinnikinnick, fivepetal cliffbush, heartleaf arnica, mountain goldenbanner, Woods’ rose, Oregongrape
Land capability subclass (nonirrigated): 7s

Typical Profile:
Oi—0 to 1 inch; slightly decomposed plant material
E—1 inch to 8 inches; very gravelly sandy loam
E and Bt1—8 to 18 inches; extremely cobbly loamy sand
E and Bt2—18 to 28 inches; extremely cobbly loamy sand
BC—28 to 72 inches; extremely cobbly sand

28—Nanita very gravelly sandy loam, 10 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,200 to 10,000 feet (2,500 to 3,048 meters)
Mean annual precipitation: 16 to 20 inches (406 to 508 millimeters)
Mean annual air temperature: 37 to 42 degrees F. (3.0 to 5.6 degrees C.)
Frost-free period: 50 to 70 days

Map Unit Composition

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

Component Descriptions

Nanita soils
Landform: Moraines
Position on landform: Backslopes
Parent material: Sandy and gravelly till derived from schist, granite, and gneiss
Slope: 10 to 60 percent
Surface fragments: About 15 percent stones, 10 percent cobbles, and 5 percent boulders
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 1.9 inches (very low)
Shrink-swell potential: About 0.3 percent (low)
Runoff class: Low
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Elk Sedge
Potential native vegetation:
Common trees: lodgepole pine, Engelmann’s spruce, Rocky Mountain Douglas-fir
Other plants: elk sedge, common juniper, kinnikinnick, fivepetal cliffbush, heartleaf arnica, mountain goldenbanner, Woods’ rose, Oregongrape
Land capability subclass (nonirrigated): 7s

Typical Profile:
Oe—0 to 1 inch; moderately decomposed plant material
E1—1 inch to 10 inches; very gravelly sandy loam
E2—10 to 23 inches; extremely gravelly loamy sand
E and Bt1—23 to 41 inches; extremely gravelly sand
E and Bt2—41 to 71 inches; extremely gravelly sand

Minor Components
Nanita, nonstony surface and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Backslopes
Distinguishing characteristics: These minor components do not contain rock fragments.

Granile and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Backslopes
Distinguishing characteristics: These minor components have developed subsoils with a higher percentage of clay than the major component soil.

29—Nanita-Rock outcrop complex, 10 to 40 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,670 to 10,000 feet (2,644 to 3,048 meters)
Mean annual precipitation: 20 to 24 inches (508 to 610 millimeters)
Mean annual air temperature: 36 to 42 degrees F. (2.2 to 5.6 degrees C.)
Frost-free period: 40 to 70 days

Map Unit Composition

Nanita and similar soils: 75 percent
Rock outcrop: 15 percent
Minor components: 10 percent

Component Descriptions

Nanita soils
Landform: Moraines
Position on landform: Backslopes
Parent material: Sandy and gravelly till derived from schist, granite, and gneiss
Slope: 10 to 40 percent
Surface fragments: About 5 percent cobbles and 1 percent stones
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: Low
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)

Ecological site: Lodgepole Pine/Elk Sedge
Potential native vegetation:
Common trees: lodgepole pine, Engelmann's spruce, Rocky Mountain Douglas-fir
Other plants: elk sedge, common juniper, kinnikinnick, fivepetal cliffbush, heartleaf arnica, mountain goldenbanner, Woods' rose, Oregongrape
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 4 inches; moderately decomposed plant material
A—4 to 6 inches; gravelly sandy loam
E1—6 to 15 inches; very gravelly loamy sand
E2—15 to 26 inches; very gravelly sand
E and Bt—26 to 43 inches; extremely cobbly loamy sand
BC—43 to 71 inches; extremely gravelly sand

Rock outcrop
Description: Rock outcrop consists of exposed granite, gneiss, and schist.
Landform: Moraines
Position on landform: Shoulders
Parent material: Granite, gneiss, and schist
Slope: 20 to 40 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Runoff class: Very high

Minor Components
Bullwark and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 30 to 50 inches to bedrock (lithic)

Legault and similar soils
Composition: About 3 percent
Landform: Moraines
Position on landform: Shoulders
Depth to restrictive feature: 5 to 20 inches to bedrock (paralithic)

Rubble land and similar soils
Composition: About 2 percent
Landform: Moraines
Position on landform: Backslopes
Distinguishing characteristics: Rubble land has areas of accumulated cobbles, stones, and boulders (talus).

30—Onahu-Terric Cryofibrists-Trailridge complex, 2 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 11,000 to 12,200 feet (3,353 to 3,718 meters)
Mean annual precipitation: 30 to 40 inches (760 to 1,016 millimeters)

Mean annual air temperature: 32 to 38 degrees F. (0.0 to 3.3 degrees C.)
Frost-free period: 10 to 30 days

Map Unit Composition

Onahu and similar soils: 35 percent
Terric Cryofibrists and similar soils: 25 percent
Trailridge and similar soils: 20 percent
Minor components: 20 percent

Component Descriptions

Onahu soils
Landform: Glaciated mountain slopes and cirques
Position on landform: Footslopes and backslopes
Parent material: Loamy alluvium over gravelly till derived from granite, gneiss, and schist
Slope: 2 to 25 percent
Surface fragments: About 5 percent boulders, 2 percent stones, and 1 percent cobbles
Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)
Drainage class: Poorly drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 0.8 percent (low)
Seasonal high water table depth: About 6 to 18 inches
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Tufted Hairgrass/Marsh Marigold
Potential native vegetation: tufted hairgrass, water sedge, groundsel, purple reedgrass, alpine bluegrass, beaked sedge, cinquefoil, diamondleaf willow, rock sedge, white marsh marigold
Land capability subclass (nonirrigated): 7e

Typical Profile:
A1—0 to 7 inches; loam
A2—7 to 16 inches; loam
2Bg—16 to 24 inches; very gravelly sandy loam
2Cg—24 to 45 inches; very gravelly sandy loam
3Cr—45 to 55 inches; weathered bedrock

Terric Cryofibrists soils
Landform: Cirques
Position on landform: Footslopes and toeslopes
Parent material: Herbaceous organic material over loamy alluvium and till derived from granite, gneiss, and schist
Slope: 2 to 7 percent
Surface fragments: About 10 percent gravel, 2 percent cobbles, and 1 percent stones
Drainage class: Very poorly drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 9.1 inches (high)
Shrink-swell potential: About 1.0 percent (low)
Ponding hazard: Occasional

Seasonal high water table depth: About 0 to 18 inches
Runoff class: Negligible
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Diamondleaf Willow/Water Sedge
Potential native vegetation: diamondleaf willow, tufted hairgrass, water sedge, grayleaf willow, beaked sedge, cinquefoil, common spikerush, rock sedge, white marsh marigold
Land capability subclass (nonirrigated): 6w

Typical Profile:
Oi—0 to 19 inches; peat
Oa—19 to 21 inches; muck
Ag—21 to 32 inches; loam
Cg1—32 to 53 inches; stratified loamy sand to loam
Cg2—53 to 60 inches; very gravelly sandy loam

Trailridge soils
Landform: Mountains
Position on landform: Shoulders and summits
Parent material: Gravelly slope alluvium and residuum weathered from granite, gneiss, and schist
Slope: 15 to 35 percent
Surface fragments: About 5 percent cobbles and 1 percent stones
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 0.7 inch (very low)
Shrink-swell potential: About 0.4 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Avens/Rock Sedge
Potential native vegetation: alpine bluegrass, rock sedge, avens, Bellardi bog sedge, Griffith wheatgrass, alpine clover, alpine sagebrush
Land capability subclass (nonirrigated): 7e

Typical Profile:
A1—0 to 6 inches; extremely gravelly sandy loam
A2—6 to 11 inches; extremely gravelly sandy loam
Bw—11 to 19 inches; extremely gravelly coarse sandy loam
Cr—19 to 29 inches; weathered bedrock

Minor Components
Mummy and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Backslopes
Distinguishing characteristics: The soil depth is greater than 60 inches and these minor soils do not have water tables.

Rock outcrop and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Shoulders and backslopes
Distinguishing characteristics: These minor components have areas of exposed bedrock.

Archrock and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Shoulders and backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Distinguishing characteristics: These minor components do not have a water table.

Fallriver and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes
Distinguishing characteristics: These minor components do not have a dark surface layer or a water table.

31—Peeler loam, 5 to 40 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,000 to 9,000 feet (2,438 to 2,743 meters)
Mean annual precipitation: 22 to 26 inches (559 to 660 millimeters)
Mean annual air temperature: 36 to 42 degrees F. (2.2 to 5.6 degrees C.)
Frost-free period: 30 to 70 days

Map Unit Composition

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

Component Descriptions

Peeler soils
Landform: Glaciated moraines and mountain slopes
Position on landform: Backslopes and footslopes
Parent material: Loamy till derived from schist, gneiss, and granite
Slope: 5 to 40 percent
Surface fragments: None
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in./hr. (moderately slow)
Available water capacity: About 8.3 inches (moderate)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Grouse Whortleberry

Potential native vegetation:
Common trees: lodgepole pine, subalpine fir, Engelmann's spruce
Other plants: grouse whortleberry, elk sedge, common juniper, russet buffaloberry, Oregongrape, Woods' rose, kinnikinnick
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 2 inches; moderately decomposed plant material
E—2 to 10 inches; loam
B/E—10 to 22 inches; sandy clay loam
Bt—22 to 40 inches; sandy clay loam
BC—40 to 62 inches; gravelly sandy clay loam

Minor Components
Tonahutu and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Footslopes and backslopes
Distinguishing characteristics: These minor components have more rock fragments than the major component soil.

Fallriver and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Backslopes
Distinguishing characteristics: This minor component has more rock fragments than the main component soil, and does not have a clay-enriched subsoil.

32—Rock outcrop-Cathedral complex, 20 to 100 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,000 to 9,100 feet (2,438 to 2,774 meters)
Mean annual precipitation: 18 to 22 inches (457 to 559 millimeters)
Mean annual air temperature: 42 to 44 degrees F. (5.6 to 6.7 degrees C.)
Frost-free period: 75 to 100 days

Map Unit Composition

Rock outcrop: 45 percent
Cathedral and similar soils: 40 percent
Minor components: 15 percent

Component Descriptions

Rock outcrop
Description: Rock outcrop consists of rounded escarpments and near vertical cliffs of exposed granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Shoulders and backslopes
Parent material: Granite, gneiss, and schist
Slope: 20 to 100 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)

Runoff class: Very high
Land capability subclass (nonirrigated): 8s

Cathedral soils
Landform: Mountain slopes
Position on landform: Backslopes
Parent material: Gravelly slope alluvium and residuum weathered from granite, gneiss, and schist
Slope: 20 to 80 percent
Surface fragments: About 10 percent gravel
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 0.8 inch (very low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Ponderosa Pine/Antelope Bitterbrush
Potential native vegetation:
Common trees: ponderosa pine
Other plants: mountain muhly, needleandthread, Parry's oatgrass, spike fescue, antelope bitterbrush, bluegrass, brome, common juniper, mountain goldenbanner, prairie sagewort, sedge
Land capability subclass (nonirrigated): 7e

Typical Profile:
A—0 to 9 inches; very gravelly sandy loam
Bw—9 to 15 inches; extremely gravelly sandy loam
R—15 to 60 inches; unweathered bedrock

Minor Components
Chasmfalls and similar soils
Composition: About 10 percent
Landform: Mountain slopes
Position on landform: Footslopes and backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Legault and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Shoulders and backslopes
Depth to restrictive feature: 5 to 20 inches to bedrock (paralithic)

33—Rock outcrop-Rubble land complex, 30 to 200 percent slopes

Map Unit Setting

Major Land Resource Area: 48A (fig. 6)
Elevation: 9,970 to 13,460 feet (3,040 to 4,104 meters)
Mean annual precipitation: 30 to 40 inches (750 to 1,016 millimeters)

Figure 6.—An area of map unit 33-Rock outcrop-Rubble land complex, 30 to 200 percent slopes, in an Alpine Life Zone. The Rock outcrop is on the upper part of the mountain slopes where the bedrock is exposed. The Rubble land is on the lower part of the mountain slopes where slopes where rock has tumbled and accumulated.

Mean annual air temperature: 30 to 41 degrees F. (-1.0 to 5.0 degrees C.)
Frost-free period: 10 to 30 days

Map Unit Composition

Rock outcrop: 40 percent
Rubble land: 30 percent
Minor components: 30 percent

Component Descriptions

Rock outcrop

Description: Rock outcrop consists of near-vertical cliffs and weathered escarpments of exposed granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Backslopes, shoulders, and summits
Parent material: Granite, gneiss, and schist
Slope: 30 to 200 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Runoff class: Very high
Land capability subclass (nonirrigated): 8s

Rubble land

Description: Rubble land consists of areas of talus accumulations of granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Backslopes
Parent material: Granite, gneiss, and schist
Slope: 30 to 200 percent
Surface fragments: About 45 percent angular stones, 40 percent angular cobbles, and 5 percent angular boulders

Runoff class: Low
Sodium adsorption ratio maximum: About 0 (nonsodic)
Land capability subclass (nonirrigated): 8s

Minor Components
Archrock and similar soils
Composition: About 10 percent
Landform: Mountains
Position on landform: Backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Mummy and similar soils
Composition: About 10 percent
Landform: Mountains
Position on landform: Backslopes
Distinguishing characteristics: The soil depth is greater than 60 inches.

Trailridge and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Shoulders and summits
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Water
Composition: About 5 percent
Landform: Cirques
Position on landform: Toeslopes and footslopes
Distinguishing characteristics: Small lakes, ponds, and streams

34—Rock outcrop-Rubble land-Enentah complex, 40 to 200 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,000 to 10,900 feet (2,743 to 3,322 meters)
Mean annual precipitation: 26 to 36 inches (660 to 915 millimeters)
Mean annual air temperature: 36 to 39 degrees F. (2.2 to 4.0 degrees C.)
Frost-free period: 20 to 50 days

Map Unit Composition

Rock outcrop: 30 percent
Rubble land: 30 percent
Enentah and similar soils: 25 percent
Minor components: 15 percent

Component Descriptions

Rock outcrop
Description: Rock outcrop consists of weathered escarpments and near vertical cliffs of exposed granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Parent material: Granite, gneiss, and schist
Slope: 40 to 200 percent

Depth to restrictive feature: 0 inches to bedrock (lithic)
Runoff class: Very high
Land capability subclass (nonirrigated): 8s

Rubble land
Description: Rubble land consists of areas of talus accumulations of granite, gneiss, and schist.
Landform: Mountain slopes
Position on landform: Backslopes
Parent material: Granite, gneiss, and schist
Slope: 40 to 200 percent
Surface fragments: About 45 percent angular stones, 40 percent angular cobbles, and 5 percent angular boulders
Runoff class: Low
Sodium adsorption ratio maximum: About 0 (nonsodic)
Land capability subclass (nonirrigated): 8s

Enentah soils
Landform: Glaciated mountain slopes
Position on landform: Backslopes
Parent material: Loamy colluvium and till derived from granite, gneiss, and schist
Slope: 40 to 70 percent
Surface fragments: About 5 percent gravel, 5 percent cobbles, and 10 percent stones
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Lodgepole Pine/Grouse Whortleberry
Potential native vegetation:
Common trees: lodgepole pine, Engelmann's spruce, subalpine fir
Other plants: grouse whortleberry, Ross' sedge, Woods' rose, bluegrass, common juniper, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
E—0 to 6 inches; very stony loam
Bs1—6 to 20 inches; very cobbly loam
Bs2—20 to 34 inches; extremely cobbly loam
Bw—34 to 56 inches; extremely cobbly sandy loam
BC—56 to 72 inches; extremely cobbly sandy loam

Minor Components
Hiamovi and similar soils
Composition: About 10 percent
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

Fallriver and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes
Distinguishing characteristics: These minor components are more acid than the main components.

35—Rofork-Chasmfalls complex, 5 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 48A (fig. 7)
Elevation: 7,700 to 9,000 feet (2,348 to 2,743 meters)
Mean annual precipitation: 16 to 22 inches (406 to 560 millimeters)
Mean annual air temperature: 40 to 43 degrees F. (4.4 to 6.1 degrees C.)
Frost-free period: 70 to 90 days

Map Unit Composition

Rofork and similar soils: 60 percent
Chasmfalls and similar soils: 30 percent
Minor components: 10 percent

Component Descriptions

Rofork soils
Landform: Structural benches and mountain slopes
Position on landform: Summits, shoulders, and backslopes
Parent material: Gravelly slope alluvium and residuum weathered from granite, gneiss, and schist
Slope: 5 to 35 percent

Figure 7.—South of Beaver Meadows Visitor Center is an area (foreground) of map unit 35-Rofork-Isolation complex, 3 to 35 percent slopes, in a Montane Life Zone.

Surface fragments: About 5 percent gravel and 1 percent cobbles
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 0.7 inch (very low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Ponderosa Pine/Antelope Bitterbrush
Potential native vegetation:
Common trees: ponderosa pine
Other plants: mountain muhly, Parry's oatgrass, mountain big sagebrush, needleandthread, prairie Junegrass, antelope bitterbrush, blue grama, bluegrass, mountain goldenbanner, ponderosa pine, wheatgrass
Land capability subclass (nonirrigated): 7e

Typical Profile:
A—0 to 5 inches; very gravelly sandy loam
Bw—5 to 10 inches; very gravelly sandy loam
C—10 to 14 inches; extremely gravelly loamy coarse sand
Cr—14 to 24 inches; weathered bedrock

Chasmfalls soils
Landform: Mountain slopes
Position on landform: Footslopes and backslopes
Parent material: Coarse-loamy slope alluvium and gravelly residuum weathered from granite, gneiss, and schist
Slope: 5 to 25 percent
Surface fragments: About 5 percent gravel
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.4 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Ponderosa Pine/Antelope Bitterbrush
Potential native vegetation:
Common trees: ponderosa pine
Other plants: mountain muhly, Parry's oatgrass, mountain big sagebrush, needleandthread, prairie Junegrass, antelope bitterbrush, blue grama, bluegrass, mountain goldenbanner, wheatgrass
Land capability subclass (nonirrigated): 6e

Typical Profile:
A1—0 to 4 inches; gravelly sandy loam
A2—4 to 13 inches; gravelly coarse sandy loam
Bw—13 to 19 inches; gravelly sandy loam
BC—19 to 28 inches; gravelly sandy loam
Cr—28 to 38 inches; weathered bedrock

Minor Components

Rock outcrop and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Distinguishing characteristics: These minor components have areas of exposed bedrock.

Lumpyridge and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Toeslopes and footslopes
Distinguishing characteristics: The soil depth is greater than 60 inches.

36—Rofork-Isolation complex, 5 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,000 to 9,000 feet (2,438 to 2,743 meters)
Mean annual precipitation: 16 to 22 inches (406 to 559 millimeters)
Mean annual air temperature: 40 to 44 degrees F. (4.4 to 6.7 degrees C.)
Frost-free period: 70 to 100 days

Map Unit Composition

Rofork and similar soils: 60 percent
Isolation and similar soils: 30 percent
Minor components: 10 percent

Component Descriptions

Rofork soils

Landform: Structural benches and mountain slopes
Position on landform: Backslopes, shoulders, and summits
Parent material: Gravelly slope alluvium and residuum weathered from granite, gneiss, and schist
Slope: 5 to 35 percent
Surface fragments: About 5 percent gravel and 1 percent cobbles
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 0.7 inch (very low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)

Ecological site: Ponderosa Pine/Antelope Bitterbrush
Potential native vegetation:
Common trees: ponderosa pine
Other plants: mountain muhly, Parry's oatgrass, needleandthread, prairie Junegrass, antelope bitterbrush, blue grama, bluegrass, mountain big sagebrush, mountain goldenbanner, ponderosa pine, wheatgrass
Land capability subclass (nonirrigated): 7e

Typical Profile:
A—0 to 5 inches; very gravelly sandy loam
Bw—5 to 10 inches; very gravelly sandy loam
C—10 to 14 inches; extremely gravelly loamy coarse sand
Cr—14 to 24 inches; weathered bedrock

Isolation soils
Landform: Moraines
Position on landform: Shoulders, footslopes, and backslopes
Parent material: Sandy and gravelly till derived from granite, gneiss, and schist
Slope: 5 to 35 percent
Surface fragments: About 25 percent gravel, 5 percent cobbles, and 2 percent stones
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.8 inches (very low)
Shrink-swell potential: About 0.3 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Ponderosa Pine/Mountain Muhly
Potential native vegetation:
Common trees: ponderosa pine
Other plants: mountain muhly, needleandthread, Parry's oatgrass, spike fescue, Ross' sedge, antelope bitterbrush, bluegrass, common juniper, currant, prairie Junegrass
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oi—0 to 1 inch; slightly decomposed plant material
A1—1 inch to 6 inches; gravelly sandy loam
A2—6 to 11 inches; very gravelly sandy loam
E and Bt—11 to 24 inches; extremely cobbly sandy loam
B/Et—24 to 33 inches; extremely gravelly sandy loam
2BC—33 to 39 inches; extremely gravelly coarse sand
2C—39 to 51 inches; very gravelly coarse sand
3C—51 to 72 inches; loamy coarse sand

Minor Components
Rock outcrop and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Shoulders
Distinguishing characteristics: These minor components have areas of exposed bedrock.

Venable and similar soils

Composition: About 5 percent
Landform: Moraines
Position on landform: Toeslopes and footslopes
Flooding hazard: Occasional
Distinguishing characteristics: These minor components have a seasonal high water table.

37—Rubble land, 20 to 65 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,500 to 9,800 feet (2,591 to 2,987 meters)
Mean annual precipitation: 20 to 28 inches (506 to 711 millimeters)
Mean annual air temperature: 37 to 41 degrees F. (3.0 to 5.0 degrees C.)
Frost-free period: 30 to 70 days

Map Unit Composition

Rubble land: 95 percent
Minor components: 5 percent

Component Descriptions

Rubble land
Description: Rubble land consists of areas of talus accumulations of granite, gneiss, and schist.
Landform: Fans
Position on landform: Backslopes and footslopes
Parent material: Granite, gneiss, and schist
Slope: 20 to 65 percent
Surface fragments: About 45 percent angular stones, 40 percent angular cobbles, and 5 percent angular boulders
Runoff class: Low
Sodium adsorption ratio maximum: About 0 (nonsodic)
Land capability subclass (nonirrigated): 8s

Minor Components
Soils similar to Nanita but with little or no vegetation and similar soils

Composition: About 5 percent
Landform: Fans
Position on landform: Backslopes and footslopes
Distinguishing characteristics: These soils have areas of accumulated sand, silt, and clay.

38—Terric Cryofibrists, 0 to 2 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,200 to 10,000 feet (2,499 to 3,048 meters)
Mean annual precipitation: 24 to 40 inches (610 to 1,016 millimeters)
Mean annual air temperature: 34 to 38 degrees F. (1.1 to 3.3 degrees C.)
Frost-free period: 30 to 60 days

Map Unit Composition

Terric Cryofibrists and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Terric Cryofibrists soils
Landform: Flood plains
Parent material: Herbaceous organic material over loamy alluvium and till derived from granite, gneiss, and schist
Slope: 0 to 2 percent
Drainage class: Very poorly drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 9.1 inches (high)
Shrink-swell potential: About 1.0 percent (low)
Flooding hazard: Frequent
Seasonal high water table depth: About 0 to 18 inches
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Diamondleaf Willow/Water Sedge
Potential native vegetation: tufted hairgrass, Baltic rush, water sedge, American mannagrass, beaked sedge, diamondleaf willow, shrubby cinquefoil, water birch
Land capability subclass (nonirrigated): 6w

Typical Profile:
Oi—0 to 19 inches; peat
Oa—19 to 21 inches; muck
Ag—21 to 32 inches; loam
Cg1—32 to 53 inches; stratified loamy sand to loam
Cg2—53 to 60 inches; very gravelly sandy loam

Minor Components
Venable and similar soils
Composition: About 10 percent
Landform: Flood plains
Drainage class: Poorly drained
Flooding hazard: Occasional
Distinguishing characteristics: These minor components do not have an organic layer on the surface.

39—Tileston very cobbly sandy loam, 10 to 40 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,000 to 10,500 feet (2,743 to 3,201 meters)
Mean annual precipitation: 24 to 40 inches (610 to 1,016 millimeters)
Mean annual air temperature: 36 to 42 degrees F. (2.2 to 5.6 degrees C.)
Frost-free period: 30 to 70 days

Map Unit Composition

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

Component Descriptions

Tileston soils
Landform: Glaciated mountain slopes and moraines
Position on landform: Backslopes
Parent material: Colluvium and till derived from granite, gneiss, and schist
Slope: 10 to 40 percent
Surface fragments: About 5 percent cobbles, 2 percent boulders, and 2 percent stones
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 3.1 inches (low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Potential native vegetation:
Common trees: limber pine, subalpine fir, Engelmann's spruce
Other plants: grouse whortleberry, dwarf blueberry, Oregongrape, Ross' sedge, bluegrass, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 3 inches; moderately decomposed plant material
E—3 to 7 inches; very cobbly sandy loam
E/B—7 to 13 inches; very gravelly sandy loam
B/E—13 to 28 inches; extremely cobbly sandy clay loam
Bt—28 to 36 inches; extremely cobbly sandy clay loam
BC—36 to 64 inches; extremely cobbly sandy loam

Minor Components
Fallriver and similar soils
Composition: About 10 percent
Landform: Mountain slopes
Position on landform: Backslopes
Distinguishing characteristics: These minor components do not have a clay-enriched subsoil.

Hiamovi and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

40—Tonahutu very gravelly sandy loam, 15 to 30 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,700 to 10,900 feet (2,652 to 3,322 meters)
Mean annual precipitation: 24 to 34 inches (610 to 864 millimeters)
Mean annual air temperature: 38 to 42 degrees F. (3.3 to 5.6 degrees C.)
Frost-free period: 30 to 70 days

Map Unit Composition

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

Component Descriptions

Tonahutu soils
Landform: Moraines
Position on landform: Backslopes
Parent material: Gravelly till derived from granite, gneiss, and schist
Slope: 15 to 30 percent
Surface fragments: About 10 percent cobbles and 1 percent stones
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Potential native vegetation:
Common trees: lodgepole pine, subalpine fir, Engelmann's spruce
Other plants: grouse whortleberry, dwarf blueberry, Ross' sedge, bluegrass, common juniper, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 1 inch; moderately decomposed plant material
E—1 inch to 6 inches; very gravelly sandy loam
E and Bt1—6 to 21 inches; very gravelly sandy loam
E and Bt2—21 to 35 inches; very gravelly sandy loam
B/Et—35 to 45 inches; very gravelly sandy clay loam
BC—45 to 62 inches; very gravelly loamy sand

Minor Components
Fallriver and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Backslopes
Distinguishing characteristics: These soils do not have a clay-enriched subsoil.

Enentah and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Backslopes
Distinguishing characteristics: These soils do not have a clay-enriched subsoil and are less acid than the major components.

Bullwark and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Backslopes
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 30 to 50 inches to bedrock (lithic)

41—Tonahutu very gravelly sandy loam, 30 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,700 to 11,000 feet (2,652 to 3,353 meters)
Mean annual precipitation: 24 to 34 inches (610 to 864 millimeters)
Mean annual air temperature: 38 to 42 degrees F. (3.3 to 5.6 degrees C.)
Frost-free period: 30 to 70 days

Map Unit Composition

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

Component Descriptions

Tonahutu soils
Landform: Moraines
Position on landform: Backslopes
Parent material: Gravelly till derived from granite, gneiss, and schist
Slope: 30 to 50 percent
Surface fragments: About 10 percent cobbles and 5 percent stones
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in./hr. (moderate)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry
Potential native vegetation:
Common trees: lodgepole pine, subalpine fir, Engelmann's spruce
Other plants: grouse whortleberry, dwarf blueberry, Ross' sedge, bluegrass, common juniper, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 1 inch; moderately decomposed plant material
E—1 inch to 6 inches; very gravelly sandy loam
E and Bt1—6 to 21 inches; very gravelly sandy loam
E and Bt2—21 to 35 inches; very gravelly sandy loam
B/Et—35 to 45 inches; very gravelly sandy clay loam
BC—45 to 62 inches; very gravelly loamy sand

Minor Components
Enentah and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Backslopes and footslopes
Distinguishing characteristics: These minor components do not have a clay-enriched subsoil and are less acid than the major soil.

Hiamovi and similar soils
Composition: About 5 percent
Landform: Moraines
Position on landform: Shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

42—Trailridge-Archrock complex, 10 to 40 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 10,500 to 12,500 feet (3,201 to 3,810 meters)
Mean annual precipitation: 30 to 40 inches (762 to 1,016 millimeters)
Mean annual air temperature: 34 to 38 degrees F. (1.1 to 3.3 degrees C.)
Frost-free period: 10 to 30 days

Map Unit Composition

Trailridge and similar soils: 40 percent
Archrock and similar soils: 35 percent
Minor components: 25 percent

Component Descriptions

Trailridge soils
Landform: Mountains
Position on landform: Shoulders and summits
Parent material: Gravelly slope alluvium and residuum weathered from granite, gneiss, and schist
Slope: 10 to 40 percent
Surface fragments: About 12 percent gravel, 10 percent stones, and 5 percent cobbles
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 0.7 inch (very low)
Shrink-swell potential: About 0.4 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None

Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Avens/Rock Sedge
Potential native vegetation: alpine bluegrass, alpine sagebrush, avens, rock sedge, tufted hairgrass, American bistort, alpine clover, alpine fescue
Land capability subclass (nonirrigated): 7e

Typical Profile:
A1—0 to 6 inches; extremely gravelly sandy loam
A2—6 to 11 inches; extremely gravelly sandy loam
Bw—11 to 19 inches; extremely gravelly coarse sandy loam
Cr—19 to 29 inches; weathered bedrock

Archrock soils
Landform: Mountains
Position on landform: Shoulders and backslopes
Parent material: Gravelly slope alluvium derived from schist, granite, and gneiss
Slope: 10 to 40 percent
Surface fragments: About 45 percent gravel, 20 percent cobbles, and 1 percent stones
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 2.2 inches (very low)
Shrink-swell potential: About 0.8 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Alpine Clover/Avens
Potential native vegetation: rock sedge, alpine bluegrass, alpine clover, alpine fescue, avens, tufted hairgrass, American bistort, alpine sagebrush, cinquefoil
Land capability subclass (nonirrigated): 7e

Typical Profile:
A—0 to 8 inches; gravelly loam
Bw—8 to 18 inches; very gravelly loam
2BC—18 to 25 inches; very gravelly coarse sandy loam
2Cr—25 to 35 inches; weathered bedrock

Minor Components
Mummy and similar soils
Composition: About 10 percent
Landform: Mountain slopes
Position on landform: Backslopes
Distinguishing characteristics: The soil depth is greater than 60 inches.

Hiamovi and similar soils
Composition: About 10 percent
Landform: Mountain slopes
Position on landform: Shoulders

Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Distinguishing characteristics: This component does not have a dark surface layer.

Rock outcrop and similar soils
Composition: About 5 percent
Landform: Mountains
Position on landform: Summits, shoulders, and backslopes
Distinguishing characteristics: This component has areas of exposed bedrock.

43—Trailridge-Mummy complex, 20 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 48A (fig. 8)
Elevation: 10,400 to 12,200 feet (3,170 to 3,718 meters)
Mean annual precipitation: 30 to 40 inches (762 to 1,016 millimeters)
Mean annual air temperature: 34 to 38 degrees F. (1.1 to 3.3 degrees C.)
Frost-free period: 10 to 30 days

Map Unit Composition

Trailridge and similar soils: 45 percent
Mummy and similar soils: 40 percent
Minor components: 15 percent

Component Descriptions

Trailridge soils
Landform: Mountains
Position on landform: Shoulders and summits

Figure 8.—Shown is an area of map unit 43-Trailridge-Mummy complex, 20 to 60 percent slopes, in an Alpine Life Zone.

Parent material: Gravelly slope alluvium and residuum weathered from granite, gneiss, and schist
Slope: 20 to 60 percent
Surface fragments: About 12 percent gravel, 5 percent cobbles, and 2 percent stones
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 0.7 inch (very low)
Shrink-swell potential: About 0.4 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Avens/Rock Sedge
Potential native vegetation: Bellardi bog sedge, alpine bluegrass, tufted hairgrass, Griffith wheatgrass, Ross' avens, alpine clover, alpine sagebrush
Land capability subclass (nonirrigated): 7e

Typical Profile:
A1—0 to 6 inches; extremely gravelly sandy loam
A2—6 to 11 inches; extremely gravelly sandy loam
Bw—11 to 19 inches; extremely gravelly coarse sandy loam
Cr—19 to 29 inches; weathered bedrock

Mummy soils
Landform: Glaciated mountains
Position on landform: Footslopes and backslopes
Parent material: Colluvium and till derived from granite, gneiss, and schist
Slope: 20 to 60 percent
Surface fragments: About 15 percent gravel, 2 percent cobbles, and 1 percent stones
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 4.6 inches (low)
Shrink-swell potential: About 0.8 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Bellardi Bog Sedge/Avens/Rock Sedge
Potential native vegetation: Bellardi bog sedge, tufted hairgrass, alpine bluegrass, avens, rock sedge, American bistort, alpine clover, cinquefoil, purple reedgrass
Land capability subclass (nonirrigated): 7e

Typical Profile:
A—0 to 10 inches; gravelly sandy loam
Bw1—10 to 21 inches; very gravelly sandy loam
Bw2—21 to 63 inches; very gravelly sandy loam

Minor Components
Archrock and similar soils
Composition: About 10 percent
Landform: Mountains

Position on landform: Summits and shoulders
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Rubble land and similar soils
Composition: About 3 percent
Landform: Mountains
Position on landform: Backslopes and footslopes
Distinguishing characteristics: Rubble land has areas of accumulated cobbles, stones, and boulders (talus).

Rock outcrop and similar soils
Composition: About 2 percent
Landform: Mountains
Distinguishing characteristics: This component has areas of exposed bedrock.

44—Venable loam, 0 to 1 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 8,200 to 9,000 feet (2,499 to 2,743 meters)
Mean annual precipitation: 16 to 24 inches (406 to 610 millimeters)
Mean annual air temperature: 38 to 42 degrees F. (3.3 to 5.6 degrees C.)
Frost-free period: 50 to 75 days

Map Unit Composition

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

Component Descriptions

Venable soils
Landform: Flood plains
Parent material: Loamy alluvium derived from granite, gneiss, and schist
Slope: 0 to 1 percent
Drainage class: Poorly drained
Slowest permeability: 0.2 to 0.6 in./hr. (moderately slow)
Available water capacity: About 7.3 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Seasonal high water table depth: About 0 to 24 inches
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Diamondleaf Willow/Water Sedge
Potential native vegetation: tufted hairgrass, water sedge, American mannagrass, rush, bluegrass, cinquefoil, grayleaf willow, diamondleaf willow, sedge, white marsh marigold
Land capability subclass (nonirrigated): 6w
Typical Profile:
Oe—0 to 3 inches; moderately decomposed plant material
A—3 to 9 inches; loam
Ag—9 to 14 inches; loam

Bg—14 to 31 inches; sandy clay loam
2Cg—31 to 43 inches; gravelly loamy coarse sand
3Cg—43 to 63 inches; very cobbly silty clay loam

Minor Components
Kawuneeche loam and similar soils
Composition: About 10 percent
Landform: Fans
Position on landform: Footslopes and toeslopes
Slope: 0 to 3 percent
Drainage class: Somewhat poorly drained
Flooding hazard: Rare
Ecological site: Baltic Rush/Sedge Sp.
Distinguishing characteristics: These minor components have less clay and are more acid than the Venable soils.

45—Ypsilon gravelly coarse sandy loam, 20 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 9,700 to 11,000 feet (2,957 to 3,353 meters)
Mean annual precipitation: 30 to 40 inches (762 to 1,016 millimeters)
Mean annual air temperature: 35 to 38 degrees F. (1.7 to 3.5 degrees C.)
Frost-free period: 20 to 50 days

Map Unit Composition

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

Component Descriptions

Ypsilon soils
Landform: Glaciated mountain slopes and moraines
Position on landform: Backslopes and footslopes
Parent material: Colluvium and till derived from granite, gneiss, and schist
Slope: 20 to 50 percent
Surface fragments: About 5 percent cobbles, 1 percent boulders, and 1 percent stones
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in./hr. (moderately rapid)
Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 0.1 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry

Potential native vegetation:
Common trees: limber pine, Engelmann's spruce, subalpine fir
Other plants: grouse whortleberry, dwarf blueberry, Ross' sedge, bluegrass, elk sedge, heartleaf arnica, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
Oe—0 to 6 inches; moderately decomposed plant material
E1—6 to 14 inches; gravelly coarse sandy loam
E2—14 to 19 inches; very cobbly coarse sandy loam
Bs1—19 to 24 inches; very cobbly coarse sandy loam
Bs2—24 to 35 inches; extremely stony sandy loam
BC—35 to 67 inches; extremely cobbly loamy coarse sand

Minor Components
Fallriver and similar soils
Composition: About 5 percent
Landform: Mountain slopes and moraines
Position on landform: Backslopes and footslopes
Distinguishing characteristics: These minor components do not have significant accumulations of iron and aluminum in the subsoil.

Hiamovi and similar soils
Composition: About 5 percent
Landform: Mountain slopes
Position on landform: Backslopes and shoulders
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

46—Water

Map Unit Setting

Elevation: 8,000 to 12,500 feet (2,438 to 3,811 meters)
Mean annual precipitation: 18 to 40 inches (457 to 1,016 millimeters)
Mean annual air temperature: 34 to 41 degrees F. (1.0 to 5.0 degrees C.)

Map Unit Composition

Water: 100 percent

Component Description

Water
Description: Water consists of small to large lakes, rivers, and streams that are large enough to delineate.
Slope: 0 percent
Drainage class: Very poorly drained

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 pasture; as rangeland and forestland; as sites for buildings, sanitary facilities, and roads; for recreational facilities; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

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

Planners 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.

Interpretive Ratings

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

Rating Class Terms

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

Numerical Ratings

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

Land Capability Classification

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

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

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

Class 1 soils have slight limitations that restrict their use.

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

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

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

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

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

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

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

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

The acreage of soils in each capability class or subclass is shown in Table 5. The capability classification of map units in this survey area is given in the section *Detailed Soil Map Units*.

Rangeland

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 6 shows, for each soil, 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 6 follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of 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 native vegetation are the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil—is listed by common name. Under *rangeland composition*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation.

Common trees are those tree species that naturally occur on a soil.

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed. Hydric soils also are listed in Table 7.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information is needed, such as information about the depth and duration of the water table. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” (USDA, 1999) and “Keys to Soil Taxonomy” (USDA, 1998) and in the “Soil Survey Manual” (USDA, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 1996).

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

The following map units meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1996).

17—Kawuneeche loam, 0 to 1 percent slopes
18—Kawuneeche mucky peat, 0 to 4 percent slopes
19—Kawuneeche mucky peat, low precipitation, 0 to 1 percent slopes
20—Kawuneeche mucky peat, 1 to 4 percent slopes
38—Terric Cryofibrists, 0 to 2 percent slopes
44—Venable loam, 0 to 1 percent slopes

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

The following map unit, in general, does not meet the definition of hydric soils because the soils do not have one of the hydric soil indicators. A portion of this map unit, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and their location(s).

20—Kawuneeche-Dystrocryepts complex, 1 to 15 percent slopes
(Dystrocryepts are classified as nonhydric soils.)

Forest Management

The tables in this section can help forest managers plan the use of soils for wood crops. They rate the soils according to the limitations that affect various aspects of forest management. In Tables 8 and 9, interpretive ratings are given for various aspects of forest management. The ratings are both verbal and numerical. Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. *Good* performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties. 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 specified forest management practice (1.00) and the point at which the soil feature is not a limitation (0.00). Rating class terms for fire damage and seedling mortality are expressed as *low, moderate*, and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00). The paragraphs that follow indicate the soil properties considered in rating the soils for forest management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet (http://nsscnt.nssc.nrcs.usda.gov/nfm/).

Ratings in the column *hazard of off-road or off-trail erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as *slight, moderate, severe*, or *very severe*. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as *slight, moderate*, or *severe*. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance; and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as *well suited, moderately suited*, or *poorly suited* to this use.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a *low, moderate*, or *high* potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Ratings in the column *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a *low, moderate*, or *high* potential for seedling mortality.

Recreation

The soils of the survey area are rated in Tables 10 and 11 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 10 and 11 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. 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.

Engineering

This section provides information for planning land uses related to building 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 and test data in the *Soil Properties* section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the *Glossary*.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Tables 12 and 13 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. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. 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 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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

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

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

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Tables 14 and 15 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. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. 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 0.00 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 downsloping 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. The 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.

Soil Properties

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

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

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

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

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

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

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches 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 particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in Table 16.

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 particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Properties

Table 17 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In Table 17, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In Table 17, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In Table 17, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

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

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

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

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

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In Table 17, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in Table 17 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 18 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

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

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in 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.

Construction Materials

Tables 19 and 20 give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In Table 19, 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 an unlikely source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated *good, fair,* or *poor* as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Soil Features

Table 21 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

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

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Water Features

Table 22 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 22 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 22 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

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

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

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

Also considered 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.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1998 and 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 23 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Inceptisol.

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 Cryept (*Cry*, meaning cold, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Dystrocryepts (*Dystro*, meaning having no free carbonates, plus *cryepts*, the suborder of the Inceptisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Dystrocryepts.

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 loamy-skeletal, isotic Typic Dystrocryepts.

SERIES. The series consists of soils within a family that have horizons similar in color, *Texture:*, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (USDA, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (USDA, 1999) and in “Keys to Soil Taxonomy” (USDA, 1998). Unless otherwise indicated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

Archrock Series

Setting

Depth class: Moderately deep
Drainage class: Somewhat excessively drained
Parent material: Slope alluvium over residuum from granite, gneiss, and schist
Landform: Mountains
Landform position: Backslopes, shoulders, and summits
Slope: 10 to 40 percent
Elevation: 10,500 to 12,500 feet
Average annual precipitation: 30 to 40 inches
Average annual air temperature: 34 to 38 degrees F
Frost-free period: 10 to 30 days

Taxonomic class: Loamy-skeletal, paramicaceous Humic Dystrocryepts

Typical Pedon

Archrock gravelly loam, in an area of Trailridge-Archrock complex, 10 to 40 percent slopes, about 0.8 mile southeast of Milner Pass in Rocky Mountain National Park; USGS Fall River Pass topographic quadrangle; latitude 40 degrees, 24 minutes, 54 seconds N; and longitude 105 degrees, 48 minutes, 01 second W, NAD 1927.

A—0 to 8 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots throughout; 25 percent gravel; very strongly acid (pH 4.8); abrupt wavy boundary.

Bw—8 to 18 inches; brownish yellow (10YR 6/6) very gravelly loam, dark yellowish brown (10YR 4/6) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine and few medium roots throughout; 50 percent gravel; strongly acid (pH 5.3); abrupt smooth boundary.

2BC—18 to 25 inches; light yellowish brown (10YR 6/4) very gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots throughout; 40 percent gravel and 15 percent cobbles; very strongly acid (pH 4.8).

2Cr—25 to 35 inches; soft schist.

Range in Characteristics

Soil moisture regime: Udic
Average annual soil temperature: 33 to 37 degrees F
Average summer soil temperature: 43 to 47 degrees F
Depth to paralithic contact: 20 to 40 inches
Thickness of the umbric epipedon: 7 to 20 inches
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Sand content: 45 to 70 percent
Mica content: 40 to 70 percent
Rock fragment content: 35 to 50 percent, dominantly gravel

A Horizon:
Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 1 to 3
Clay content: 10 to 18 percent
Rock fragment content: 15 to 35 percent, dominantly gravel
Base saturation: 10 to 40 percent
Reaction: very strongly acid or strongly acid

Bw Horizon:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 4 to 6
Clay content: 10 to 18 percent
Texture: very gravelly loam, very gravelly sandy loam
Rock fragment content: 35 to 60 percent, dominantly gravel
Base saturation: 10 to 50 percent
Reaction: very strongly acid to moderately acid

2BC Horizon: (2C Horizon in some pedons)
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 to 6
Clay content: 5 to 18 percent
Texture: very gravelly coarse sandy loam, very gravelly sandy loam
Rock fragment content: 35 to 60 percent, dominantly gravel
Reaction: very strongly acid to moderately acid

Bullwark Series

Setting

Depth class: Moderately deep
Drainage class: Well drained
Parent material: Colluvium and residuum from granite, gneiss, and schist
Landform: Mountain slopes
Landform position: Backslopes, footslopes
Slope: 5 to 50 percent
Elevation: 8,000 to 9,900 feet
Average annual precipitation: 18 to 24 inches
Average annual air temperature: 38 to 42 degrees F
Frost-free period: 50 to 70 days

Taxonomic class: Loamy-skeletal, paramicaceous Lamellic Eutrocryepts

Typical Pedon

Bullwark very gravelly coarse sandy loam, in an area of Bullwark-Catamount complex, 20 to 50 percent slopes, about 3.2 miles west of the McGraw Ranch entrance in Rocky Mountain National Park; USGS Estes Park topographic quadrangle; latitude 40 degrees, 2 minutes, 34 seconds N; longitude 105 degrees, 33 minutes, 38 seconds W, NAD 1927.

Oi—0 to 2 inches; slightly decomposed plant material.
E—2 to 9 inches; light gray (10YR 7/2) very gravelly coarse sandy loam; brown (10YR 5/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common medium and coarse roots and many very fine and fine roots;

25 percent gravel and 10 percent cobbles and 3 percent stones; slightly acid (pH 6.4); clear wavy boundary.

E and Bt1—9 to 15 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 5/3) moist (E); weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots and few medium roots; 25 percent gravel and 10 percent cobbles; moderately acid (pH 5.6); lamellae of yellowish brown (10YR 5/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist (Bt); weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; total lamellae thickness of 1.0 inches; moderately acid (pH 5.6); clear wavy boundary.

E and Bt2—15 to 23 inches; pale brown (10YR 6/3) very cobbly sandy loam, brown (10YR 5/3) moist (E); weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few fine and medium roots; 20 percent gravel and 15 percent cobbles and 3 percent stones; moderately acid (pH 5.6); lamellae of yellowish brown (10YR 5/4) very cobbly sandy clay loam, dark yellowish brown (10YR 4/4) moist (Bt); weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; total thickness of lamellae is 4.5 inches; moderately acid (pH 5.6); clear wavy boundary.

Cr—23 to 32 inches; soft decomposed granite and gneiss.

R—32 to 60 inches; hard granite and gneiss.

Range in Characteristics

(*Note: Depths are given from the mineral soil surface.)
Soil moisture regime: Udic bordering on ustic
Average annual soil temperature: 36 to 40 degrees F
Average summer soil temperature: 43 to 47 degrees F
Thickness of lamellae: 3 to 6 inches
Thickness of the cambic horizon: 13 to 25 inches
Depth to paralithic contact: 20 to 40 inches
Particle-size control section (weighted average):
- *Clay content:* 10 to 18 percent
- *Sand content:* 55 to 70 percent
- *Rock fragments content:* 35 to 60 percent
- *Mica content:* 40 to 60 percent mica (by grain count)

E Horizon:
- *Hue:* 7.5YR or 10YR
- *Value:* 6 or 7 dry, 4 or 5 moist
- *Chroma:* 2 or 3
- *Clay content:* 8 to 18 percent
- *Rock fragments content:* 35 to 50 percent
- *Reaction:* moderately acid or slightly acid

E and Bt Horizons:
- *Hue:* 7.5YR or 10YR
- *Value:* 6 or 7 dry, 4 or 5 moist (E)
- *Value:* 5 or 6 dry, 4 or 5 moist Bt)
- *Chroma:* 2 or 3 (E)
- *Chroma:* 3 through 6 (Bt)
- *Clay content:* 10 to 27 percent
- *Texture:* very gravelly coarse sandy loam, very gravelly sandy loam, very cobbly sandy loam, very cobbly sandy clay loam
- *Base saturation:* 70 to 90 percent

Rock fragments content: 35 to 60 percent
Reaction: moderately acid or slightly acid
Lamellae content: the number of lamellae increases with depth

Catamount Series

Setting

Depth class: Shallow
Drainage class: Somewhat excessively drained
Parent material: Slope alluvium and residuum from granite, gneiss, and schist
Landform: Structural benches
Landform position: Backslopes, summits, and shoulders
Slope: 5 to 40 percent
Elevation: 8,000 to 10,000 feet
Average annual precipitation: 18 to 24 inches
Average annual air temperature: 37 to 43 degrees F
Frost-free period: 50 to 70 days

Taxonomic class: Loamy-skeletal, paramicaceous, shallow Ustic Dystrocryepts

Typical Pedon

Catamount gravelly coarse sandy loam, in an area of Catamount gravelly coarse sandy loam, 5 to 20 percent slopes, about 6 miles northwest of north boundary trailhead in Rocky Mountain National Park; USGS Estes Park topographic quadrangle; latitude 40 degrees, 27 minutes, 45 seconds N; longitude 105 degrees, 31 minutes, 44 seconds W, NAD 1927.

Oi—0 inches to 1 inch; slightly decomposed plant material.
A—1 inch to 3 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 30 percent gravel; strongly acid (pH 5.4); abrupt smooth boundary.
Bw—3 to 10 inches; brown (10YR 5/3) very gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 40 percent gravel; strongly acid (pH 5.2); abrupt smooth boundary.
BC—10 to 14 inches; light yellowish brown (10YR 6/4) very gravelly coarse sandy loam, dark yellowish brown (10YR 4/6) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 55 percent gravel; strongly acid (pH 5.2); abrupt irregular boundary.
Cr—14 to 24 inches; soft weathered gneiss and schist.

Range in Characteristics

(*Note: Depths are given from the mineral soil surface.)

Soil moisture regime: Udic bordering on ustic
Mean annual soil temperature: 40 to 44 degrees F
Mean summer soil temperature: 46 to 49 degrees F
Depth to paralithic contact: 10 to 20 inches
Depth to cambic horizon: 3 to 6 inches
Thickness of the cambic horizon: 6 to 10 inches
Particle-size control section (weighted average):
Clay content: 5 to 18 percent
Sand content: 55 to 70 percent

Rock fragments content: 35 to 60 percent
Mica content: 35 to 60 percent mica (by grain count)

A Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 or 3
Texture: gravelly coarse sandy loam, very gravelly coarse sandy loam
Clay content: 5 to 18 percent
Reaction: strongly acid to slightly acid

Bw Horizon:
Hue: 7.5YR or 10YR
Value: 5 through 7 dry, 4 or 5 moist
Chroma: 3 through 6
Texture: very gravelly coarse sandy loam, very gravelly sandy loam
Clay content: 5 to 18 percent
Rock fragments content: 40 to 60 percent
Reaction: strongly acid to slightly acid
Base saturation: 50 to 70 percent

BC Horizon:
Hue: 7.5YR or 10YR
Value: 5 through 7 dry, 4 or 5 moist
Chroma: 3 through 6
Texture: very gravelly coarse sandy loam, very gravelly sandy loam
Clay content: 5 to 18 percent
Rock fragments content: 35 to 60 percent
Reaction: strongly acid or moderately acid
Base saturation: 30 to 60 percent

Cathedral Series

Setting

Depth class: Shallow
Drainage class: Somewhat excessively drained
Parent material: Slope alluvium from granite, gneiss, and schist
Landform: Mountain slopes
Landform position: South-facing backslopes
Slope: 20 to 80 percent
Elevation: 8,000 to 9,100 feet
Average annual precipitation: 18 to 22 inches
Average annual air temperature: 42 to 44 degrees F
Frost-free period: 75 to 100 days

Taxonomic class: Loamy-skeletal, paramicaceous, frigid Lithic Haplustolls

Typical Pedon

Cathedral very gravelly sandy loam, in an area of Rock outcrop-Cathedral complex, 20 to 100 percent slopes, about 300 feet north and 2,600 feet west of the southeast corner of sec. 31, T 5 N, R 73 W; USGS Longs Peak topographic quadrangle; latitude 40 degrees, 21 minutes, 6 seconds N; longitude 105 degrees, 37 minutes, 10 seconds W, NAD 1927.

A—0 to 9 inches; brown (7.5YR 4/2) very gravelly sandy loam, black (7.5YR 2/1) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots and common medium and coarse; 45 percent gravel and 5 percent cobbles; moderately acid (pH 6.0); abrupt wavy boundary.

Bw—9 to 15 inches; brown (7.5YR 5/3) extremely gravelly sandy loam, brown (7.5YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine to coarse roots and many very fine; 50 percent gravel and 15 percent cobbles; moderately acid (pH 6.0); abrupt irregular boundary.

R—15 to 60 inches; hard granite.

Range in Characteristics

Soil moisture regime: Ustic
Depth to lithic contact: 10 to 20 inches
Thickness of the mollic epipedon: 7 to 16 inches
Particle-size control section (weighted average):
Clay content: 8 to 15 percent
Sand content: 55 to 70 percent
Rock fragments content: 55 to 75 percent
Mica content: 40 to 60 percent mica (by grain count)

A Horizon:
Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 1 through 3
Clay content: 8 to 18 percent
Rock fragments content: 35 to 60 percent, dominantly gravel
Base saturation: 60 to 80 percent
Reaction: moderately acid to neutral

Bw Horizon:
Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 through 4 moist
Chroma: 2 through 4
Clay content: 5 to 18 percent
Texture: extremely gravelly sandy loam, extremely gravelly coarse sandy loam
Rock fragments content: 35 to 75 percent, dominantly gravel
Base saturation: 60 to 100 percent
Reaction: moderately acid to neutral

Chasmfalls Series

Setting

Depth class: Moderately deep
Drainage class: Somewhat excessively drained
Parent material: Slope alluvium and residuum from granite, schist, and gneiss
Landform: Mountain slopes
Landform position: Backslopes and footslopes
Slope: 5 to 25 percent
Elevation: 7,700 to 9,000 feet
Average annual precipitation: 16 to 22 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 70 to 90 days

Taxonomic class: Coarse-loamy, paramicaceous, frigid Pachic Haplustolls

Typical Pedon

Chasmfalls gravelly sandy loam, in an area of Rofork-Chasmfalls complex, 5 to 35 percent slopes about 1,300 feet south and 400 feet west of the northeast corner of sec. 30, T 5 N, R 73 W; USGS Estes Park topographic quadrangle; latitude 40 degrees, 22 minutes, 34 seconds N; longitude 105 degrees, 36 minutes, 31 seconds W, NAD 1927.

A1—0 to 4 inches; very dark gray (10YR 3/1) gravelly sandy loam, black (10YR 2/1) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 15 percent gravel; slightly acid (pH 6.2); abrupt wavy boundary.

A2—4 to 13 inches; very dark grayish brown (10YR 3/2) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; 30 percent gravel; slightly acid (pH 6.2); clear smooth boundary.

Bw—13 to 19 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; 30 percent gravel; neutral (pH 6.8); clear smooth boundary.

BC—19 to 28 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; massive; loose, nonsticky and nonplastic; few very fine and fine roots; 20 percent gravel; neutral (pH 7.0); abrupt wavy boundary.

Cr—28 to 38 inches; soft, partially decomposed granite.

Range in Characteristics

Soil moisture regime: Ustic
Mean annual soil temperature: 40 to 43 degrees F
Mean summer soil temperature: 59 to 63 degrees F
Depth to paralithic contact: 20 to 40 inches
Thickness of the mollic epipedon: 16 to 40 inches
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Sand content: 50 to 70 percent
Rock fragments content: 25 to 35 percent
Mica content: 40 to 70 percent (by grain count)

A Horizons:
Hue: 7.5YR or 10YR
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 1 through 3
Texture: gravelly sandy loam or gravelly coarse sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 15 to 35 percent
Reaction: moderately acid to neutral

Bw Horizon:
Hue: 7.5YR or 10YR
Value: 3 through 5 dry, 2 through 3 moist
Chroma: 2 or 3
Texture: gravelly sandy loam, gravelly coarse sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 15 to 35 percent
Reaction: slightly acid or neutral

BC Horizon:
Hue: 7.5YR or 10YR
Value: 3 through 5 dry, 2 through 4 moist
Chroma: 2 or 4
Texture: gravelly sandy loam, gravelly coarse sandy loam
Clay content: 8 to 16 percent
Rock fragments content: 15 to 35 percent
Reaction: slightly acid or neutral

Dystrocryepts

Setting

Depth class: Very deep
Drainage class: Somewhat poorly, moderately well, and well drained
Parent material: Alluvium from granite, gneiss, and schist
Landform: Drainageways
Landform position: Footslopes
Elevation: 8,500 to 10,700 feet
Slope: 5 to 15 percent
Average annual precipitation: 24 to 40 inches
Average annual air temperature: 36 to 40 degrees F
Frost-free period: 40 to 60 days

Taxonomic class: Dystrocryepts

Typical Pedon

Dystrocryepts, in an area of Kawuneeche-Dystrocryepts complex, 1 to 15 percent slopes, about 0.6 mile northwest of Medicine Bow Curve; USGS Fall River topographic quadrangle; latitude 40 degrees, 27 minutes, 9 seconds N; longitude 105 degrees, 45 seconds, 51 minutes W.

A—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; strongly acid (pH 5.2); clear smooth boundary.

Bw1—8 to 20 inches; brown (10YR 5/2) loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; 10 percent gravel; strongly acid (pH 5.4); gradual smooth boundary.

Bw2—20 to 30 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few fine strong brown (7.5YR 4/6) iron concentrations; few very fine and fine roots; 10 percent gravel; moderately acid (pH 5.6); abrupt smooth boundary.

2BC—30 to 60 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common medium strong brown (7.5YR 4/6) iron concentrations; few very fine and fine roots; 35 percent gravel; moderately acid (pH 5.8).

Range in Characteristics

Thickness of the umbric epipedon: 16 to 24 inches
Depth to endosaturation: 24 to 60 inches
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Sand content: 40 to 60 percent

Rock fragments content: 15 to 25 percent
Mica content: 15 to 30 percent

A Horizon:
Hue: 7.5YR or 10YR
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 2 or 3
Clay content: 10 to 20 percent
Reaction: very strongly acid or strongly acid
Base saturation: 30 to 50 percent

Bw Horizons:
Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 to 4 moist
Chroma: 2 to 4
Texture: loam or sandy loam
Clay content: 10 to 18 percent
Rock fragment content: 5 to 15 percent
Reaction: very strongly acid to moderately acid
Base saturation: 30 to 50 percent

BC Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 to 6
Texture: very gravelly sandy loam, very gravelly loam
Clay content: 8 to 18 percent
Rock fragment content: 35 to 60 percent
Reaction: very strongly acid to moderately acid

Enentah Series

Setting

Depth class: Very deep
Drainage class: Somewhat excessively drained
Parent material: Colluvium and till derived from granite, gneiss, and schist
Landform: Moraines and glaciated mountain slopes
Landform position: Backslopes and footslopes
Slope: 10 to 70 percent
Elevation: 9,000 to 11,000 feet
Average annual precipitation: 26 to 40 inches
Average annual air temperature: 36 to 42 degrees F
Frost-free period: 20 to 50 days

Taxonomic class: Loamy-skeletal, mixed, superactive Typic Eutrocryepts

Typical Pedon

Enentah very stony loam, in an area of Enentah-Rubble land complex, 25 to 70 percent slopes, about 0.3 mile north of Mesquito Creek on the Grand Ditch in Rocky Mountain National Park; USGS Fall River topographic quadrangle; latitude 40 degrees, 24 minutes, 45 seconds N; longitude 105 degrees, 51 minutes, 59 seconds W, NAD 1927. The surface is covered with about 2 percent boulders, 2 percent stones, and 25 percent cobbles.

E—0 to 6 inches; light gray (10YR 7/2) very stony loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine to coarse roots; 20 percent gravel, 5 percent cobbles and 20 percent stones; strongly acid (pH 5.4); abrupt wavy boundary.

Bs1—6 to 20 inches; yellowish brown (10YR 5/4) very cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; 20 percent gravel, 25 percent cobbles and 10 percent stones; moderately acid (pH 6.0); clear smooth boundary.

Bs2—20 to 34 inches; yellowish brown (10YR 5/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; 35 percent gravel and 30 percent cobbles; moderately acid (pH 5.8); gradual smooth boundary.

Bw—34 to 56 inches; pale brown (10YR 6/3) extremely cobbly sandy loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; 35 percent gravel and 30 percent cobbles; moderately acid (pH 5.8); abrupt smooth boundary.

BC—56 to 72 inches; light yellowish brown (2.5Y 6/3) extremely cobbly sandy loam, light olive brown (2.5Y 5/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; 35 percent gravel and 30 percent cobbles; moderately acid (pH 5.6).

Range in Characteristics

Soil moisture regime: Udic
Mean annual soil temperature: 34 to 40 degrees F
Mean summer soil temperature: 39 to 45 degrees F
Depth to albic horizon: 0 to 4 inches
Depth to cambic horizon: 4 to 10 inches
Thickness of the cambic horizon: 34 to 60 inches
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Sand content: 45 to 75 percent
Rock fragments content: 45 to 65 percent gravel, cobbles, and stones
Mica content: 15 to 30 percent

E Horizon:
Hue: 7.5YR or 10YR
Value: 6 to 8 dry, 4 to 6 moist
Chroma: 1 to 3
Clay content: 10 to 20 percent
Rock fragments content: 35 to 60 percent
Base saturation: 40 to 60 percent
Reaction: strongly acid or moderately acid

Bs Horizons:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 4 to 6
Texture: extremely cobbly loam, extremely cobbly sandy loam, very cobbly loam, very cobbly sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 35 to 80, dominantly gravel and cobbles
Base saturation: 50 to 75 percent
Reaction: moderately acid or slightly acid

Bw Horizon:
Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 4
Texture: extremely cobbly sandy loam, extremely cobbly coarse sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 60 to 80 percent, dominantly gravel and cobbles
Base saturation: 50 to 75 percent
Reaction: moderately acid or slightly acid

BC Horizon:
Hue: 7.5YR to 2.5Y
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 4
Texture: extremely cobbly sandy loam, extremely cobbly loamy sand
Clay content: 5 to 15 percent
Rock fragments content: 60 to 80, dominantly gravel and cobbles
Base saturation: 40 to 75 percent
Reaction: moderately acid or slightly acid

Fallriver Series

Setting

Depth class: Very deep
Drainage class: Somewhat excessively drained
Parent material: Till and colluvium from granite, gneiss, and schist
Landform: Glaciated mountain slopes and moraines
Landform position: Backslopes and footslopes
Slope: 10 to 55 percent
Elevation: 9,000 to 11,800 feet
Average annual precipitation: 24 to 40 inches
Average annual air temperature: 36 to 40 degrees F
Frost-free period: 20 to 50 days

Taxonomic class: Loamy-skeletal, isotic, Typic Dystrocryepts

Typical Pedon

Fallriver extremely cobbly sandy loam, in an area of Fallriver extremely cobbly sandy loam, 10 to 45 percent slopes, about 3.6 miles north of Grand Lake in Rocky Mountain National Park; USGS Allens Park topographic quadrangle; latitude 40 degrees, 18 minutes, 08 seconds, N; longitude 105 degrees, 49 minutes, 11 seconds W, NAD 1927.

Oe—0 to 2 inches; moderately decomposed plant material.
E—2 to 9 inches; light gray (10YR 7/2) gravelly sandy loam, grayish brown (10YR 5/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine to coarse roots; 20 percent gravel and 5 percent cobbles; very strongly acid (pH 4.6); abrupt smooth boundary.
Bs1—9 to 21 inches; light yellowish brown (10YR 6/4) very cobbly sandy loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots and few fine roots; few faint patchy clay films on faces of peds; few faint patchy iron stains on faces of peds; 20 percent gravel, 30 percent cobbles, and 5 percent stones; very strongly acid (pH 4.8); clear smooth boundary.
Bs2—21 to 35 inches; brown (7.5YR 5/4) very cobbly sandy loam, brown (7.5YR 4/4)

moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine roots; few faint patchy clay films on faces of peds; common distinct continuous iron stains on faces of peds; 20 percent gravel and 30 percent cobbles and 5 percent stones; very strongly acid (pH 4.8); clear smooth boundary.

BC—35 to 63 inches; light yellowish brown (10YR 6/4) very gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; 40 percent gravel and 10 percent cobbles; moderately acid (pH 5.6).

Range in Characteristics

(*Note: Depths are from the mineral soil surface.)

Soil moisture regime: Udic
Mean annual soil temperature: 34 to 38 degrees F
Mean summer soil temperature: 38 to 42 degrees F
Depth to cambic horizon: 4 to 12 inches
Ratio of 15-bar water/clay: 0.60 to 0.95
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Sand content: 55 to 75 percent
Rock fragments content: 40 to 60 percent, dominantly gravel and cobbles
Mica content: 15 to 30 percent (by grain content)

E Horizon:
Hue: 10YR or 7.5YR
Value: 6 or 7 dry, 4 through 6 moist
Chroma: 2 or 3
Clay content: 8 to 18 percent
Rock fragments content: 15 to 35 percent
Base saturation: 20 to 50 percent
Reaction: very strongly acid or strongly acid

Bs Horizons:
Hue: 5YR to 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 through 6
Texture: very cobbly sandy loam, very cobbly coarse sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 35 to 60 percent
Aluminum oxalate extractable Al + $\frac{1}{2}$ Fe: 0.20 to 0.50 percent
Base saturation: 20 to 50 percent
Reaction: very strongly acid or strongly acid
pH by NaFl: 8.7 to 10.0

BC Horizon: (C horizon in some pedons)
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 through 6
Texture: very gravelly coarse sandy loam, very gravelly loamy coarse sand
Clay content: 5 to 15 percent
Rock fragments content: 35 to 60 percent
Base saturation: 30 to 60 percent
Reaction: very strongly acid to moderately acid

Galuche Series

Setting

Depth class: Shallow
Drainage class: Somewhat excessively drained
Parent material: Slope alluvium and residuum from granitic rocks, gneiss, and schist
Landform: Mountain slopes
Landform position: Shoulders, backslopes, and summits
Slope: 20 to 90 percent
Elevation: 7,800 to 9,800 feet
Average annual precipitation: 16 to 22 inches
Average annual air temperature: 42 to 46 degrees F
Frost-free period: 75 to 95 days

Taxonomic class: Loamy-skeletal, paramicaceous, frigid Lithic Dystrustepts

Typical Pedon

Galuche very gravelly sandy loam, in an area of Galuche-Rock outcrop complex, 20 to 90 percent slopes, about 1.1 miles west of Moraine Park Campground in Rocky Mountain National Park; located about 2,300 feet west and 1,000 feet north of the southeast corner of sec. 31, T 5 N, R 73 W; USGS Longs Peak topographical quadrangle; latitude 40 degrees, 21 minutes, 13.5 seconds N; longitude 105 degrees, 37 minutes, 6.5 seconds W, NAD 1927.

Oe—0 inches to 1 inch; moderately decomposed plant material.
A—1 inch to 3 inches; dark grayish brown (10YR 4/2) very gravelly sandy loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; 35 percent gravel, 15 percent cobbles, and 1 percent stones; neutral (pH 6.8); abrupt wavy boundary.
E—3 to 9 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 35 percent gravel, 10 percent cobbles, and 1 percent stones; strongly acid (pH 5.4); abrupt wavy boundary.
Bw—9 to 19 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; 35 percent gravel and 10 percent cobbles; very strongly acid (pH 4.6); clear irregular boundary.
R—19 to 60 inches; hard granite and gneiss

Range in Characteristics

(*Note: Depths are given from the mineral soil surface.)

Soil moisture regime: Ustic
Mean annual soil temperature: 41 to 45 degrees F
Mean summer soil temperature: 57 to 60 degrees F
Depth to lithic contact: 10 to 20 inches
Depth to albic horizon: 0 to 3 inches
Thickness of the cambic horizon: 6 to 10 inches
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Sand content: 50 to 75 percent
Rock fragments content: 40 to 55 percent, dominantly gravel and cobbles
Mica content: 40 to 70 percent (by grain content)

A Horizon:
Hue: 7.5YR or 10YR
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 2 or 3
Clay content: 10 to 20 percent
Rock fragments content: 35 to 60 percent
Reaction: slightly acid or neutral

E Horizon:
Hue: 7.5YR or 10YR
Value: 5 through 7 dry, 4 through 6 moist
Chroma: 2 or 3
Texture: very gravelly sandy loam, very gravelly coarse sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 35 to 60 percent
Reaction: strongly acid or moderately acid

Bw Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 through 6
Texture: very gravelly sandy loam, very gravelly coarse sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 35 to 60 percent
Base saturation: 30 to 60 percent
Reaction: very strongly acid to moderately acid

Granile Series

Setting

Depth class: Very deep
Drainage class: Well drained
Parent material: Colluvium from granite, gneiss, and schist
Landform: Mountain slopes
Landform position: Backslopes
Slope: 30 to 60 percent
Elevation: 8,000 to 10,000 feet
Average annual precipitation: 20 to 24 inches
Average annual air temperature: 38 to 41 degrees F
Frost-free period: 50 to 70 days

Taxonomic class: Loamy-skeletal, mixed, superactive Ustic Glossocryalfs

Typical Pedon

Granile very gravelly coarse sandy loam, in an area of Granile very gravelly coarse sandy loam, 30 to 60 percent slopes, about 0.4 mile north of “The Needles” in the Cow Creek drainage in Rocky Mountain National Park; USGS Estes Park topographic quadrangle; latitude 40 degrees, 2 minutes, 20 seconds N; longitude 105 degrees, 32 minutes, 59 seconds W, NAD 1927.

Oe—0 to 3 inches; moderately decomposed plant material.
E—3 to 8 inches; light gray (10YR 7/2) very gravelly coarse sandy loam (composite *Texture:*), dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and common medium and coarse roots; 35 percent gravel and 5 percent cobbles and 10 percent stones; moderately acid (pH 6.0); abrupt wavy boundary.

E/B—8 to 21 inches; 60 percent very pale brown (10YR 7/3) extremely gravelly coarse sandy loam (composite *Texture:*), brown (10YR 5/3) moist (E); weak fine subangular blocky structure; hard, friable, nonsticky and nonplastic; common fine and few medium roots; 50 percent gravel and 10 percent cobbles; moderately acid; 40 percent yellowish brown (10YR 5/4), dark yellowish brown (10YR 4/4) moist (B); moderate medium subangular blocky structure; hard, friable, nonsticky and nonplastic; few distinct patchy clay films on faces of peds; 60 percent of the total volume is tongues of albic material; moderately acid (pH 5.8); clear smooth boundary.

Bt—21 to 43 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few distinct patchy clay films on faces of peds; 40 percent gravel and 15 percent cobbles; moderately acid (pH 6.0); clear wavy boundary.

BC—43 to 65 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; 40 percent gravel and 10 percent cobbles; moderately acid (pH 6.0).

Range in Characteristics

(*Note: Depths are given from the mineral soil surface.)
Soil moisture regime: Udic bordering on ustic
Thickness of the glossic horizon: 4 to 14 inches
Depth to top of the argillic horizon: 12 to 24 inches
Particle-size control section (weighted average):
Clay content: 20 to 28 percent
Sand content: 45 to 65 percent
Rock fragment content: 35 to 70 percent
Mica content: 15 to 30 percent (by grain count)

E Horizon:
Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 or 5 moist
Chroma: 2 or 3
Clay content: 8 to 18 percent
Reaction: moderately acid or slightly acid

E/B Horizon:
Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 through 6 moist (E)
Value: 5 or 6 dry, 4 or 5 moist (Bt)
Chroma: 2 or 3 (E)
Chroma: 3 through 6 (Bt)
Clay content: 10 to 18 percent
Texture: extremely gravelly coarse sandy loam, extremely gravelly sandy loam
Reaction: moderately acid or slightly acid

Bt Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 through 6
Clay content: 20 to 35 percent
Texture: very gravelly sandy clay loam, very gravelly clay loam
Reaction: moderately acid or slightly acid

BC Horizon:
Hue: 7.5YR or 10YR
Value: 5 through 7 dry, 4 through 6 moist
Chroma: 3 through 6
Clay content: 15 to 27 percent
Texture: very gravelly sandy clay loam, very gravelly sandy loam, very gravelly coarse sandy loam
Reaction: moderately acid or slightly acid

Hiamovi Series

Setting

Depth class: Shallow
Drainage class: Somewhat excessively drained
Parent material: Till, slope alluvium, and residuum from granite, gneiss, and schist
Landform: Glaciated mountain slopes
Landform position: Backslopes, shoulders, and summits
Slope: 5 to 65 percent
Elevation: 9,000 to 12,000 feet
Average annual precipitation: 26 to 40 inches
Average annual air temperature: 36 to 42 degrees F
Frost-free period: 10 to 50 days

Taxonomic class: Loamy-skeletal, paramicaceous Lithic Dystocryepts

Typical Pedon

Hiamovi extremely gravelly sandy loam, in an area of Fallriver-Hiamovi complex, 10 to 55 percent slopes, about 1.8 miles southwest of Milner Pass in Rocky Mountain National Park; USGS Fall River topographic quadrangle; latitude 40 degrees, 24 minutes, 29 seconds N; longitude 105 degrees, 50 minutes, and 26 seconds W, NAD 1927.

E—0 to 5 inches; very pale brown (10YR 7/3) extremely gravelly sandy loam, brown (10YR 5/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium and coarse roots; 55 percent gravel and 10 percent cobbles; strongly acid (pH 5.2); abrupt smooth boundary.

Bw—5 to 13 inches; very pale brown (10YR 7/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium and coarse roots; 65 percent gravel, 15 percent cobbles and 5 percent stones; strongly acid (pH 5.2); clear irregular boundary.

R—13 to 60 inches; hard granite and gneiss.

Range in Characteristics

Soil moisture regime: Udic bordering on ustic
Mean annual soil temperature: 36 to 40 degrees F
Mean summer soil temperature: 45 to 48 degrees F
Depth to lithic contact: 10 to 20 inches
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Sand content: 45 to 70 percent
Rock fragment content: 60 to 80 percent, dominantly gravel and cobbles
Mica content: 40 to 70 percent (by grain count)

E Horizon:

Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 or 5 moist
Chroma: 2 or 3
Clay content: 8 to 18 percent
Reaction: strongly acid or moderately acid

Bw Horizon:

Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 or 5 moist
Chroma: 3 or 4
Texture: extremely gravelly sandy loam, extremely gravelly coarse sandy loam
Clay content: 8 to 18 percent
Reaction: strongly acid or moderately acid
Base saturation: 30 to 60 percent

Isolation Series

Setting

Depth class: Very deep
Drainage class: Somewhat excessively drained
Parent material: Till from granite, gneiss, and schist
Landform: Moraines
Landform position: Backslopes, shoulders, and footslopes
Slope: 5 to 35 percent
Elevation: 8,000 to 9,000 feet
Average annual precipitation: 16 to 22 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 70 to 100 days

Taxonomic class: Loamy-skeletal, mixed, superactive frigid Alfic Argiustolls

Typical Pedon

Isolation gravelly sandy loam, in an area of Isolation gravelly sandy loam, 5 to 35 percent slopes; about 1,200 feet west and 2,000 feet south of the northeast corner of sec. 32, T 5 N, R 73 W; USGS Longs Peak topographic quadrangle; latitude 40 degrees, 22 minutes, 1 second N; longitude 105 degrees, 35 minutes, 44 seconds W, NAD 1927.

Oi—0 inches to 1 inch; slightly decomposed plant material.

A1—1 inch to 6 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; 25 percent gravel, 5 percent cobbles and 2 percent stones; slightly acid (pH 6.4); abrupt smooth boundary.

A2—6 to 11 inches; dark grayish brown (10YR 4/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 30 percent gravel, 10 percent cobbles and 10 percent stones; neutral (pH 6.6); abrupt wavy boundary.

E and Bt—11 to 24 inches; light gray (10YR 7/2) extremely cobbly sandy loam, light brownish gray (10YR 6/2) moist (E); weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 40 percent gravel and 30 percent cobbles; neutral (pH 6.8); lamellae of yellowish brown (10YR 5/4) extremely cobbly sandy loam, dark yellowish brown (10YR 4/4) moist (Bt); abrupt smooth boundary. Total thickness of lamellae is 1.3 inches.

Bt and E—24 to 33 inches; yellowish brown (10YR 5/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist (Bt); moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; 50 percent gravel and 15 percent cobbles; neutral (pH 6.6); pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist (E); abrupt smooth boundary. The total thickness of lamellae is 6.25 inches and averages 18 percent clay.

2BC—33 to 39 inches; yellowish brown (10YR 5/4) extremely gravelly coarse sand, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 65 percent gravel; neutral (pH 7.0); abrupt smooth boundary.

2C1—39 to 51 inches; light yellowish brown (10YR 6/4) very gravelly coarse sand, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 50 percent gravel; neutral (pH 6.8); abrupt smooth boundary.

3C2—51 to 72 inches; brownish yellow (10YR 6/6) and yellowish brown (10YR 5/4) loamy coarse sand, yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 10 percent boulders; neutral (pH 7.0).

Range in Characteristics

(*Note: Depths are given from the mineral soil surface.)
Soil moisture regime: Ustic
Mean annual soil temperature: 40 to 44 degrees F
Thickness of the mollic epipedon: 10 to 16 inches
Depth to the base of the argillic horizon: 28 to 50 inches, total thickness of lamellae is 6 to 12 inches
Depth to lithologic discontinuity with very coarse and coarse sand: 28 to 50 inches
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Sand content: 55 to 75 percent
Rock fragments content: 45 to 65 percent, dominantly gravel and cobbles
Mica content: 15 to 30 percent (by grain count)

A Horizons:
Hue: 7.5YR or 10YR
Value: 3 through 5 dry, 2 or 3 moist
Chroma: 1 through 3
Clay content: 8 to 18 pecent
Texture: gravelly sandy loam, very gravelly sandy loam
Rock fragments content: 15 to 60 percent
Base saturation: 60 to 100 percent
Reaction: slightly acid or neutral

E and Bt Horizons:
Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 or 5 moist (E part); 5 or 6 dry, 4 or 5 moist (Bt part)
Chroma: 2 through 4 (E part), 3 through 6 (Bt part)
Texture: extremely cobbly sandy loam, extremely cobbly coarse sandy loam
Clay content: 10 to 20 pecent (E & Bt)
Base saturation: 60 to 100 percent
Rock fragments content: 35 to 70 percent
Reaction: slightly acid or neutral

Bt and E Horizons:
Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 or 5 moist (E part); 5 or 6 dry, 4 or 5 moist (Bt part)
Chroma: 2 through 4 (E part, 3 through 6 (Bt part)
Texture: extremely gravelly sandy loam, extremely cobbly sandy loam
Clay content: 10 to 20 pecent (E & Bt)
Rock fragments content: 60 to 80 percent
Base saturation: 60 to 100 percent
Reaction: slightly acid or neutral

2BC Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 4 through 6
Texture: extremely gravelly coarse sand, extremely gravelly loamy coarse sand
Clay content: 0 to 10 pecent
Rock fragments content: 60 to 80 percent
Base saturation: 60 to 100 percent
Reaction: slightly acid or neutral

2C1 Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 4 through 6
Texture: very gravelly coarse sand, very gravelly sand
Clay content: 0 to 8 pecent
Rock fragments content: 35 to 70 percent
Base saturation: 60 to 100 percent
Reaction: slightly acid or neutral

3C2 Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 4 through 6
Texture: coarse sand, loamy coarse sand
Clay content: 0 to 10 pecent
Rock fragments content: 0 to 15 percent
Base saturation: 60 to 100 percent
Reaction: slightly acid or neutral

Kawuneeche Series

Setting

Depth class: Very deep
Drainage class: Poorly drained
Parent material: Alluvium over glaciofluvial deposits from granite, gneiss, and schist
Landform: Flood plains
Slope: 0 to 4 percent
Elevation: 8,000 to 10,700 feet
Average annual precipitation: 18 to 36 inches
Average annual air temperature: 36 to 42 degrees F
Frost-free period: 40 to 75 days

Taxonomic class: Coarse-loamy, mixed, superactive, nonacid Fluvaquentic Cryaquepts

Typical Pedon

Kawuneeche mucky peat, in an area of Kuwuneeche mucky peat, 0 to 4 percent slopes, about 2.3 miles northwest of the Kawuneeche visitors center in Rocky Mountain National Park; located about 1,800 feet west and 1,400 feet north of the southeast corner of sec. 13, T 4 N, R 76 W; USGS Grand Lake topographical quadrangle; latitude 40 degrees, 18 minutes, 16 seconds N; longitude 105 degrees, 50 minutes, 55 seconds W, NAD 1927.

Oe—0 to 5 inches; very dark grayish brown (10YR 3/2) mucky peat, very dark brown (10YR 2/2) moist; many very fine and fine roots and few medium roots; strongly acid (pH 5.2); clear smooth boundary.

A—5 to 12 inches; black (10YR 2/1) clay loam, black (10YR 2/1) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; strongly acid (pH 5.2); abrupt smooth boundary.

Bg—12 to 23 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common medium irregular dark yellowish brown (10YR 3/4) masses of iron concentrations on faces of peds; 2 percent gravel; strongly acid (pH 4.8); clear smooth boundary.

Cg1—23 to 31 inches; grayish brown (10YR 5/2) coarse sandy loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; common medium irregular dark yellowish brown (10YR 4/4) masses of iron concentrations on faces of peds; 10 percent gravel; moderately acid (pH 5.6); clear smooth boundary.

2Cg2—31 to 66 inches; grayish brown (10YR 5/2) very gravelly loamy sand, dark greenish gray (10GY 3/1) moist; single grain; loose, nonsticky and nonplastic; few fine roots; 35 percent gravel; slightly acid (pH 6.4).

Range in Characteristics

(*Note: Depths given are measured from the mineral soil surface.)
Soil moisture regime: Aquic
Mean annual soil temperature: 36 to 40 degrees F
Mean summer soil temperature: 41 to 43 degrees F (with an O horizon)
Depth to lithologic discontinuity: 24 to 43 inches
Depth to redox concentrations: 12 to 24 inches
Depth to redox depletions: 5 to 12 inches
Depth to endosaturation from the organic surface: 0 to 18 inches from June through August
Thickness of the umbric epipedon: 7 to 24 inches
Particle-size control section (weighted average):
Clay content: 5 to 15 percent
Sand content: 50 to 70 percent
Rock fragments content: 10 to 25 percent, dominantly gravel
Mica content: 15 to 30 percent (by grain count)

Oe Horizon: (not in all pedons)
Reaction: Very strongly acid or strongly acid

A Horizon:
Hue: 7.5YR or 10YR
Value: 2 through 4 dry, 2 or 3 moist
Chroma: 1 or 2

Texture: loam or clay loam
Clay content: 20 to 35 percent
Rock fragments content: 0 to 15 percent gravel
Base saturation: 30 to 50 percent
Reaction: very strongly acid or strongly acid

Bg Horizon:
Hue: 7.5YR or 10YR
Value: 4 through 6 dry, 3 through 5 moist
Chroma: 1 or 2
Texture: loam, silt loam, gravelly sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 0 to 25 percent gravel
Base saturation: 30 to 60 percent
Reaction: very strongly acid to moderately acid

Cg1 Horizon:
Hue: 10YR or 7.5YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 1 or 2
Texture: sandy loam, coarse sandy loam, gravelly sandy loam, gravelly loamy fine sand
Clay content: 5 to 18 percent
Rock fragments content: 5 to 30 percent gravel
Base saturation: 40 to 70 percent
Reaction: strongly acid to slightly acid

2Cg2 Horizon:
Hue: 10GY, 5GY, 10YR or neutral
Value: 4 through 6 dry, 3 through 5 moist
Chroma: 0 through 2
Texture: very gravelly loamy sand, very gravelly sand, extremely gravelly coarse sand
Clay content: 1 to 7 percent
Rock fragments content: 35 to 75 percent gravel and cobbles
Base saturation: 50 to 70 percent
Reaction: moderately acid or slightly acid

Legault Series

Setting

Depth class: Very shallow and shallow
Drainage class: Somewhat excessively drained
Parent material: Slope alluvium over residuum from granite, schist, and gneiss
Landform: Mountain slopes and structural benches
Landform position: Shoulders and backslopes
Slope: 15 to 45 percent
Elevation: 8,500 to 10,000 feet
Average annual precipitation: 18 to 24 inches
Average annual air temperature: 37 to 41 degrees F
Frost-free period: 50 to 75 days

Taxonomic class: Sandy-skeletal, paramicaceous, shallow Typic Cryorthents

Typical Pedon

Legault very gravelly sandy loam, in an area of Legault very gravelly sandy loam, 15 to 45 percent slopes, about 0.1 mile north of the Deer Ridge parking area in Rocky Mountain National Park; USGS Estes Park topographic quadrangle; latitude 40 degrees, 23 minutes, 14 seconds N; longitude 105 degrees, 36 minutes, 33 seconds W, NAD 1927.

Oe—0 inches to 1 inch; moderately decomposed plant material.

A—1 inch to 3 inches; dark grayish brown (10YR 4/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few fine and medium roots; 40 percent gravel; slightly acid (pH 6.5); abrupt wavy boundary.

E—3 to 8 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few medium and coarse roots and common fine; 55 percent gravel and 10 percent cobbles; moderately acid (pH 5.8); clear irregular boundary.

EB—8 to 12 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine and medium roots; 65 percent gravel and 10 percent cobbles; moderately acid (pH 6.0); clear irregular boundary.

Cr—12 to 22 inches; soft, partially decomposed granite.

Range in Characteristics

(*Note: Depths given are measured from the mineral soil surface.)

Soil moisture regime: Ustic

Mean annual soil temperature: 41 to 45 degrees F

Mean summer soil temperature: 45 to 47 degrees F

Depth to paralithic contact: 5 to 20 inches

Particle-size control section (weighted average):

- *Clay content:* 3 to 8 percent
- *Sand content:* 80 to 90 percent
- *Rock fragments content:* 35 to 70 percent
- *Mica content:* 40 to 60 percent (by grain count)

A Horizon: (not present in all pedons)

- *Hue:* 7.5YR or 10YR
- *Value:* 4 or 5 dry, 2 or 3 moist
- *Chroma:* 2 or 3
- *Clay content:* 5 to 15 percent
- *Rock fragments content:* 35 to 60 percent
- *Reaction:* moderately acid or slightly acid

E Horizon:

- *Hue:* 7.5YR or 10YR
- *Value:* 6 or 7 dry, 4 or 5 moist
- *Chroma:* 2 through 4
- *Clay content:* 1 to 5 percent
- *Texture:* extremely gravelly loamy sand, extremely gravelly loamy coarse sand
- *Rock fragments content:* 60 to 80 percent
- *Reaction:* moderately acid or slightly acid

EB Horizon:

- *Hue:* 7.5YR or 10YR
- *Value:* 5 or 6 dry, 4 or 5 moist
- *Chroma:* 3 through 6
- *Clay content:* 1 to 5 percent

Texture: extremely gravelly loamy sand, extremely gravelly loamy coarse sand
Rock fragments content: 60 to 80 percent
Reaction: moderately acid or slightly acid

Lumpyridge Series

Setting

Depth class: Very deep
Drainage class: Well drained
Parent material: Alluvium from granite, gneiss, and schist
Landform: Fans
Slope: 1 to 15 percent
Elevation: 7,500 to 8,700 feet
Average annual precipitation: 16 to 22 inches
Average annual air temperature: 42 to 46 degrees F
Frost-free period: 70 to 100 days

Taxonomic class: Fine-loamy, paramicaceous, frigid Typic Argiustolls

Typical Pedon

Lumpyridge coarse sandy loam, in an area of Lumpyridge-Rofork complex, 3 to 15 percent slopes, about 0.5 mile northeast of Castle Mountain in Rocky Mountain National Park; USGS Estes Park topographical quadrangle; latitude 40 degrees, 23 minutes, 40 seconds N; longitude 105 degrees, 32 minutes, 08 seconds W, NAD 1927.

A1—0 to 6 inches; very dark grayish brown (10YR 3/2) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and common very fine roots; 15 percent gravel; slightly acid (pH 6.4); abrupt smooth boundary.

A2—6 to 11 inches; brown (10YR 4/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and common very fine roots; 15 percent gravel; neutral (pH 6.6); clear wavy boundary.

Bt1—11 to 25 inches; brown (7.5YR 5/4) gravelly sandy loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; few distinct continuous clay films on faces of peds; 25 percent gravel; neutral (pH 6.8); clear wavy boundary.

Bt2—25 to 39 inches; brown (7.5YR 5/4) gravelly sandy clay loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine and few very fine roots; common prominent continuous clay films on faces of peds; 25 percent gravel; neutral (pH 6.8); gradual smooth boundary.

2BC—39 to 45 inches; yellowish brown (10YR 5/4) very gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; 37 percent gravel; neutral (pH 6.8); abrupt smooth boundary.

2C—45 to 80 inches; dark yellowish brown (10YR 4/4) very gravelly loamy coarse sand, dark yellowish brown (10YR 3/4) moist; single grain; loose, nonsticky and nonplastic; 40 percent gravel; neutral (pH 7.0).

Range in Characteristics

Soil moisture regime: Ustic
Mean annual soil temperature: 42 to 45 degrees F

Mean summer soil temperature: 60 to 62 degrees F
Depth to argillic horizon: 8 to 15 inches
Depth to the base of the argillic horizon: 25 to 45 inches
Depth to lithologic discontinuity: 25 to 45 inches
Thickness of the mollic epipedon: 8 to 15 inches
Particle-size control section (weighted average):
Clay content: 18 to 27 percent
Sand content: 50 to 65 percent
Rock fragments content: 15 to 30 percent, dominantly fine and very fine gravel
Mica content: 40 to 70 percent (by grain count)

A Horizons:
Hue: 7.5YR or 10YR
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 2 or 3
Texture: gravelly coarse sandy loam or gravelly sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 15 to 25 percent
Reaction: slightly acid or neutral

Bt Horizons:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 through 6
Texture: gravelly sandy loam, gravelly sandy clay loam
Clay content: 18 to 30 percent
Rock fragments content: 15 to 35 percent
Reaction: slightly acid or neutral

2BC Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 4 through 6
Texture: very gravelly coarse sandy loam, very gravelly loamy coarse sand
Clay content: 3 to 10 percent percent
Rock fragments content: 35 to 60 percent
Reaction: slightly acid or neutral

2C Horizon:
Hue: 7.5YR or 10YR
Value: 4 through 6 dry, 3 through 5 moist
Chroma: 4 through 6
Texture: very gravelly loamy coarse sand, very gravelly coarse sand
Clay content: 0 to 7 percent
Rock fragments content: 35 to 60 percent
Reaction: slightly acid or neutral

Mummy Series

Setting

Depth class: Very deep
Drainage class: Somewhat excessively drained
Parent material: Colluvium and till from granite, gneiss, and schist
Landform: Mountains
Landform position: Footslopes and backslopes
Slope: 10 to 60 percent

Elevation: 10,400 to 12,200 feet
Average annual precipitation: 30 to 40 inches
Average annual air temperature: 34 to 38 degrees F
Frost-free period: 10 to 30 days

Taxonomic class: Loamy-skeletal, paramicaceous Humic Dystrocryepts

Typical Pedon

Mummy extremely cobbly sandy loam, in an area of Mummy extremely cobbly sandy loam, 20 to 50 percent slopes, about 1.8 miles southeast of Fall River Pass in Rocky Mountain National Park; USGS Trail Ridge topographic quadrangle; latitude 40 degrees, 24 minutes, 24 seconds N; longitude 105 degrees, 42 minutes, 04 seconds W, NAD 1927.

A—0 to 5 inches; dark grayish brown (10YR 4/2) extremely cobbly sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine and common medium roots; 15 percent gravel and 30 percent cobbles and 20 percent stones; very strongly acid (pH 4.8); abrupt wavy boundary.

Bw1—5 to 24 inches; brown (10YR 5/3) extremely cobbly sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine and few medium roots; 15 percent gravel, 30 percent cobbles and 20 percent stones; strongly acid (pH 5.4); clear smooth boundary.

Bw2—24 to 72 inches; yellowish brown (10YR 5/4) extremely cobbly sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; 20 percent gravel and 30 percent cobbles and 10 percent stones; strongly acid (pH 5.2).

Range in Characteristics

Soil moisture regime: Udic
Mean annual soil temperature: 32 to 36 degrees F
Mean summer soil temperature: 43 to 47 degrees F
Thickness of the umbric horizon: 10 to 30 inches
Particle-size control section (weighted average):
- *Clay content:* 8 to 18 percent
- *Sand content:* 45 to 75 percent
- *Rock fragments content:* 45 to 65 percent
- *Mica content:* 40 to 70 percent (by grain count)

A Horizon:
- *Hue:* 7.5YR or 10YR
- *Value:* 3 or 4 dry, 2 or 3 moist
- *Chroma:* 2 or 3
- *Texture:* gravelly sandy loam, extremely cobbly sandy loam
- *Clay content:* 10 to 18 percent
- *Rock fragments content:* 15 to 75 percent, dominantly gravel and cobbles
- *Base saturation:* 10 to 40 percent
- *Reaction:* very strongly acid or strongly acid

Bw1 Horizon:
- *Hue:* 7.5 YR or 10YR
- *Value:* 4 to 6 dry, 2 to 4 moist
- *Chroma:* 2 or 3

Texture: extremely cobbly sandy loam, very gravelly sandy loam, very gravelly loam
Clay content: 10 to 20 percent
Rock fragments content: 35 to 75 percent, dominantly gravel and cobbles
Base saturation: 10 to 50 percent
Reaction: very strongly acid or strongly acid

Bw2 Horizon:
Hue: 7.5YR to 10YR
Value: 5 to 7 dry, 3 to 5 moist
Chroma: 3 to 6
Texture: extremely cobbly coarse sandy loam, extremely cobbly sandy loam, very gravelly loam, very cobbly sandy loam, very gravelly sandy loam, very gravelly coarse sandy loam. Some pedons have a texture (fine-earth fraction) of loamy coarse sand below a depth of 40 inches.
Clay content: 8 to 18 percent
Rock fragments content: 35 to 75 percent, dominantly gravel and cobbles
Base saturation: 40 to 60 percent
Reaction: very strongly acid to moderately acid

Nanita Series

Setting

Depth class: Very deep
Drainage class: Somewhat excessively drained
Parent material: Till and colluvium from granite, gneiss, and schist
Landform: Moraines and glaciated mountain slopes
Landform position: Shoulders, backslopes, and summits
Slope: 1 to 60 percent
Elevation: 8,200 to 10,000 feet
Average annual precipitation: 16 to 24 inches
Average annual air temperature: 36 to 42 degrees F
Frost-free period: 40 to 70 days

Taxonomic class: Sandy-skeletal, mixed, Lamellic Cryorthents

Typical Pedon

Nanita very gravelly sandy loam, in an area of Nanita very gravelly sandy loam, 10 to 60 percent slopes; about 800 feet south and 1,700 feet east of the northwest corner of sec. 5, T 4 N, R 73 W; USGS Longs Peak topographic quadrangle; latitude 40 degrees, 20 minutes, 55 seconds N; longitude 105 degrees, 35 minutes, 41 seconds W, NAD 1927.

Oe—0 inches to 1 inch; moderately decomposed plant material.
E1—1 inch to 10 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common medium roots; 30 percent gravel and 10 percent cobbles; neutral (pH 6.6); abrupt smooth boundary.
E2—10 to 23 inches; very pale brown (10YR 7/3) extremely gravelly loamy sand, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine to medium roots; 40 percent gravel and 20 percent cobbles; neutral (pH 6.8); abrupt smooth boundary.
E and Bt1—23 to 41 inches; 85 percent light gray (10YR 7/2) extremely gravelly sand, brown (10YR 4/3) moist (E); 15 percent lamellae of brown (10YR 5/3) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist (Bt); weak fine

subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; lamellae are discontinuous horizontal to diagonal, .2 to 1 cm thick with total thickness of 4 cm; 40 percent gravel and 20 percent cobbles; slightly acid (pH 6.4); gradual smooth boundary.

E and Bt2—41 to 71 inches; light gray (10YR 7/2) extremely gravelly sand, grayish brown (10YR 5/2) moist (E); lamellae of yellowish brown (10YR 5/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist (Bt); weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; lamellae are discontinuous horizontal to diagonal, .2 to 1 cm thick with total thickness of 5.5 cm; 35 percent gravel, 15 percent cobbles, and 10 percent stones; neutral (pH 6.6).

Range in Characteristics

(*Note: Depths given are measured from the mineral soil surface.)
Soil moisture regime: Ustic
Mean annual soil temperature: 36 to 40 degrees F
Mean summer soil temperature: 40 to 45 degrees F
Depth to lamellae: 10 to 24 inches
Thickness of lamellae: .2 to 1 cm, total thickness of 5 to 12 cm
Clay content in lamellae: 5 to 18 percent
Particle-size control section (weighted average):
Clay content: 1 to 8 percent
Sand content: 75 to 90 percent
Rock fragments content: 45 to 70 percent
Mica content: 15 to 30 percent (by grain count)
Note: An A horizon is present in some pedons.

E1 Horizon:
Hue: 7.5YR or 10YR
Value: 6 to 8 dry, 4 to 6 moist
Chroma: 1 to 3
Texture: very gravelly sandy loam, very gravelly loamy sand, extremely gravelly loamy coarse sand
Clay content: 5 to 18 percent
Rock fragments content: 35 to 80 percent
Reaction: strongly acid to neutral

E2 Horizon:
Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 3
Texture: extremely gravelly loamy sand, very gravelly sand
Clay content: 0 to 8 percent
Rock fragments content: 35 to 80 percent
Reaction: moderately acid to neutral

E and Bt Horizons:
Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist (E)
Value: 5 or 6 dry, 4 or 5 moist (Bt)
Chroma: 2 or 3 (E), 3 to 6 (Bt)
Texture: extremely gravelly sand, extremely gravelly loamy sand, extremely cobbly loamy sand, extremely cobbly loamy coarse sand (E), extremely gravelly sandy loam, extremely cobbly sandy loam (Bt)

Clay content: 0 to 5 percent (E), 5 to 18 percent (Bt)
Rock fragments content: 35 to 80 percent
Reaction: moderately acid to neutral

BC Horizon: (Present in some pedons)
Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 3 to 6
Texture: extremely gravelly sand, extremely cobbly loamy coarse sand, extremely cobbly sand
Clay content: 2 to 8 percent
Reaction: moderately acid to neutral

Onahu Series

Setting

Depth class: Deep
Drainage class: Poorly drained
Parent material: Alluvium over till from granite, gneiss, and schist
Landform: Glaciated mountains slopes and cirques
Landform position: Toeslopes, backslopes, and footslopes
Slope: 2 to 25 percent
Elevation: 11,000 to 12,500
Average annual precipitation: 30 to 40 inches
Average annual air temperature: 32 to 38 degrees F
Frost-free period: 10 to 30 days

Taxonomic class: Loamy-skeletal, paramicaceous, acid Aeric Humic Cryaquepts

Typical Pedon

Onahu loam, in an area of Onahu-Terric Cryofibrists-Trailridge complex, 2 to 35 percent slopes About 1.9 miles south of the Gore Range Overlook in Rocky Mountain National Park; USGS Fall River topographic quadrangle; latitude 40 degrees, 24 minutes, 24 seconds N; longitude 105 degrees, 46 minutes, 31 seconds W, NAD 1927.

A1—0 to 7 inches; brown (7.5YR 4/2) loam, very dark brown (7.5YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; very strongly acid (pH 4.5); clear smooth boundary.
A2—7 to 16 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; 10 percent gravel; very strongly acid (pH 4.5); abrupt smooth boundary.
Bg—16 to 24 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common medium dark yellowish brown (10YR 4/6) masses of iron concentrations throughout and common medium light gray (10YR 7/1) iron depletions throughout; 40 percent gravel; very strongly acid (pH 4.6); clear smooth boundary.
Cg—24 to 45 inches; dark gray (10YR 4/1) very gravelly sandy loam, light gray (10YR 7/1) dry; massive; soft, very friable, slightly sticky and slightly plastic; common fine dark yellowish brown (10YR 4/6) masses of iron concentrations throughout; 50 percent gravel and 5 percent cobbles; very strongly acid (pH 4.6).
3Cr—45 to 55 inches; soft weathered gneiss and schist.

Range in Characteristics

Soil moisture regime: Aquic
Mean annual soil temperature: 33 to 35 degrees F
Mean summer soil temperature: 36 to 40 degrees F
Thickness of the umbric epipedon: 12 to 24 inches
Depth to episaturation: 6 to 18 inches
Depth to redox concentrations: 7 to 18 inches
Depth to redox depletions: 15 to 24 inches
Depth to paralithic contact: 40 to 60 inches
Base saturation: 15 to 45 percent
Particle-size control section (weighted average):
  Clay content: 8 to 18 percent
  Sand content: 45 to 60 percent
  Rock fragments content: 35 to 45 percent, dominantly gravel and cobble
  Mica content: 35 to 60 percent (by grain count)

A1 Horizon:
  Hue: 7.5YR or 10YR
  Value: 3 or 4 dry, 2 or 3 moist
  Chroma: 1 to 3
  Clay content: 10 to 18 percent
  Texture: loam, sandy loam, fine sandy loam
  Rock fragments content: 0 t 15 percent
  Base saturation: 15 to 35 percent
  Reaction: very strongly acid or strongly acid

A2 Horizon:
  Hue: 7.5YR or 10YR
  Value: 3 or 4 dry, 2 or 3 moist
  Chroma: 1 to 3
  Clay content: 10 to 18 percent
  Texture: loam, fine sandy loam, or sandy loam
  Rock fragments content: 0 t 25 percent
  Base saturation: 15 to 45 percent
  Reaction: very strongly acid or strongly acid

2Bg Horizon:
  Hue: 7.5YR or 10YR
  Value: 4 to 6 dry, 3 to 5 moist
  Chroma: 1 or 2
  Clay content: 10 to 18 percent
  Texture: very gravelly sandy loam, very gravelly fine sandy loam
  Rock fragments content: 35 t 60 percent
  Base saturation: 25 to 45 percent
  Reaction: very strongly acid or strongly acid

2Cg Horizon:
  Hue: 7.5YR to 2.5Y
  Value: 5 to 7 dry, 4 to 6 moist
  Chroma: 1 or 2
  Clay content: 8 to 18 percent
  Texture: very gravelly sandy loam, very gravelly coarse sandy loam
  Base saturation: 25 to 45 percent
  Reaction: very strongly acid or strongly acid

Peeler Series

Setting

Depth class: Very deep
Drainage class: Well drained
Parent material: Till from granite, gneiss, and schist
Landform: Moraines and glaciated mountain slopes
Landform position: Backslopes and footslopes
Slope: 5 to 40 percent
Elevation: 8,000 to 9,000 feet
Average annual precipitation: 22 to 26 inches
Average annual air temperature: 36 to 42 degrees F
Frost-free period: 30 to 70 days

Taxonomic class: Fine-loamy, mixed, superactive, Ustic Glossocryalfs

Typical Pedon

Peeler loam, in an area of Peeler loam, 5 to 40 percent slopes, about 1,850 feet north and 1,600 feet west of the southeast corner of sec. 19, T 3 N, R 75 W; USGS Shadow Mountain topographic quadrangle; latitude 40 degrees, 12 minutes, 12 seconds N; longitude 105 degrees, 49 minutes, 54 seconds W, NAD 1927.

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; very pale brown (10YR 7/3) loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium and coarse roots; 22.0 percent clay; moderately acid (pH 5.9); clear smooth boundary.

B/E—10 to 22 inches; 80 percent brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist (Bt), and 20 percent very pale brown (10YR 7/3) sandy clay loam, brown (10YR 4/3) (E) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine and few medium and coarse roots; 20 percent of the total volume is tongues of albic material; few distinct patchy clay films on faces of peds and in pores; 10 percent gravel; slightly acid (pH 6.2); gradual wavy boundary.

Bt—22 to 40 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; strong medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine and fine and few medium and coarse roots; 5 percent of the total area is tongues of albic material; few prominent continuous clay films on faces of peds and few distinct patchy pale brown (10YR 6/3) skeletans on faces of peds and in pores; 10 percent gravel; neutral (pH 6.7); clear wavy boundary.

BC—40 to 62 inches; light brown (7.5YR 6/4) gravelly sandy clay loam, brown (7.5YR 4/4) moist; weak coarse subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine to coarse roots; 22 percent gravel; neutral (pH 6.7).

Range in Characteristics

(*Note: Depths given are measured from the mineral soil surface.)
Thickness of the albic horizon: 4 to 12 inches
Depth to base of the argillic horizon: 30 to 60 inches
Particle-size control section (weighted average):
  Clay content: 18 to 27 percent
  Sand content: 45 to 65 percent
  Rock fragment content: 5 to 20 percent
  Mica content: 15 to 30 percent (by grain count)

E Horizon:
Hue: 7.5YR or 10YR
Value: 6 through 8 dry, 4 through 6 moist
Chroma: 1 to 3
Clay content: 15 to 25 percent
Reaction: strongly acid to slightly acid

B/E Horizon:
Hue: 7.5YR or 10YR
Value: 6 through 8 dry, 4 through 6 moist (E)
Value: 5 or 6 dry, 4 or 5 moist (Bt)
Chroma: 1 to 3 (E), 3 to 6 (Bt)
Clay content: 20 to 35 percent
Texture: sandy clay loam, loam
Reaction: moderately acid to neutral

Bt Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 to 6
Clay content: 20 to 35 percent
Texture: sandy clay loam, clay loam
Reaction: moderately acid to neutral

BC Horizon:
Hue: 7.5YR or 10YR
Value: 5 through 7 dry, 4 through 6 moist
Chroma: 3 to 6
Clay content: 20 to 27 percent
Texture: gravelly sandy loam, gravelly sandy clay loam
Reaction: slightly acid or neutral

(*Note: The Peeler soils in this survey area are taxadjuncts because they have an udic moisture regime that does not border ustic. This difference, however, does not significantly affect the use, management, or interpretations of the soils. In this survey the Peeler soils are fine-loamy, mixed, superactive, Typic Glossocryalfs.)

Rofork Series

Setting

Depth class: Shallow
Drainage class: Somewhat excessively drained
Parent material: Slope alluvium and residuum from granite, schist, and gneiss
Landform: Mountain slopes and structural benches
Landform position: Summits, shoulders, and backslopes
Slope: 5 to 35 percent
Elevation: 7,500 to 9,000 feet
Average annual precipitation: 16 to 22 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 70 to 100 days

Taxonomic class: Loamy-skeletal, paramicaceous, frigid, shallow Entic Haplustolls

Typical Pedon

Rofork very gravelly sandy loam, in an area of Rofork-Chasmfalls complex, 5 to 35 percent slopes, about 2,000 feet south and 150 feet east of the northwest corner of sec. 29, T 5 N, R 73 W; USGS Longs Peak topographic quadrangle; latitude 40 degrees, 22 minutes, 28 seconds N; longitude 105 degrees, 36 minutes, 24 seconds W, NAD 1927.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) very gravelly sandy loam, black (10YR 2/1) moist; moderate medium granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 40 percent gravel; neutral (pH 6.8); abrupt smooth boundary.

Bw—5 to 10 inches; dark grayish brown (10YR 4/2) very gravelly sandy loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky and weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 40 percent gravel; neutral (pH 6.8); abrupt wavy boundary.

C—10 to 14 inches; brown (10YR 5/3) extremely gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; 70 percent gravel; neutral (pH 7.0).

Cr—14 to 24 inches; soft to moderately hard, partially decomposed granite.

Range in Characteristics

Soil moisture regime: Ustic
Mean annual soil temperature: 41 to 45 degrees F
Mean summer soil temperature: 59 to 63 degrees F
Thickness of the mollic epipedon: 7 to 16 inches
Depth to paralithic contact: 10 to 20 inches
Particle-size control section (weighted average):
- *Clay content:* 8 to 18 percent
- *Sand content:* 55 to 75 percent
- *Rock fragments content:* 40 to 60 percent, dominantly gravel
- *Mica content:* 40 to 70 percent (by grain count)

A Horizon:
- *Hue:* 7.5YR or 10YR
- *Value:* 3 to 5 dry, 2 or 3 moist
- *Chroma:* 1 to 3
- *Clay content:* 12 to 18 percent
- *Rock fragments content:* 35 to 60 percent, dominantly gravel
- *Reaction:* slightly acid or neutral

Bw Horizon:
- *Hue:* 7.5YR or 10YR
- *Value:* 3 to 6 dry, 2 to 4 moist
- *Chroma:* 2 to 4
- *Clay content:* 12 to 18 percent
- *Texture:* very gravelly sandy loam or very gravelly coarse sandy loam
- *Rock fragments content:* 35 to 60 percent, dominantly gravel
- *Reaction:* slightly acid or neutral

C Horizon (not in all pedons):
- *Hue:* 7.5YR or 10YR
- *Value:* 4 to 6 dry, 3 to 5 moist
- *Chroma:* 3 or 4
- *Clay content:* 5 to 10 percent
- *Texture:* extremely gravelly coarse sandy loam or extremely gravelly loamy coarse sand
- *Rock fragments content:* 60 to 75 percent, dominantly gravel
- *Reaction:* slightly acid or neutral

Terric Cryofibrists

Setting

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Herbaceous organic material over alluvium and till derived from granite, gneiss, and schist
Landform: Flood plains and cirques
Elevation: 8,200 to 12,200 feet
Slope: 0 to 7 percent
Average annual precipitation: 24 to 40 inches
Average annual air temperature: 32 to 38 degrees F
Frost-free period: 10 to 60 days

Taxonomic class: Terric Cryofibrists

Typical Pedon

Reference pedon was from an area of Terric Cryofibrists, 0 to 2 percent slopes; Horseshoe Park near Endovalley picnic area in Rocky Mountain National park; USGS Trailridge topographical quadrangle; latitude 40 degrees, 24 minutes, 38 seconds N; longitude 105 degrees, 38 minutes, 38 seconds W, NAD 1927.

Oi—0 to 19 inches; dark grayish brown (10YR 4/2) peat, very dark grayish brown (10YR 3/2) moist; about 80 percent fibers rubbed; very strongly acid (pH 4.8); abrupt smooth boundary.
Oa—19 to 21 inches; very dark gray (10YR 3/1) muck, black (10YR 2/1) moist; about 5 percent fibers rubbed; very strongly acid (pH 4.6); abrupt smooth boundary.
Ag—21 to 32 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine to medium roots; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation on faces of peds; strongly acid (pH 5.1); clear smooth boundary.
Cg1—32 to 53 inches; dark gray (7.5YR 4/1) stratified loamy sand, sandy loam, and loam, very dark gray (7.5YR 3/1) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation on faces of peds; moderately acid (pH 5.2); clear smooth boundary.
Cg2—53 to 60 inches; very dark gray (7.5YR 3/1) very gravelly sandy loam, black (7.5YR 2.5/1) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine and fine roots; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation on faces of peds; 40 percent gravel; strongly acid (pH 5.1).

Range in Characteristics

Soil moisture regime: Aquic
Mean annual soil temperature: 32 to 36 degrees F
Mean summer soil temperature: 34 to 38 degrees F
Thickness of organic soil materials: 16 to 40 inches
Particle-size control section (weighted average):
Rock fragment content: 0 to 50 percent
Mica content: 20 to 50 percent (by grain count)

O Horizons:
Hue: 7.5YR or 10YR
Value: 3 or 4 dry, 2 or 3 moist

Chroma: 1 or 2
Texture: peat, mucky peat, muck
Rock fragments content: 0 to 25 percent
Reaction: very strongly acid or strongly acid

Ag Horizon:
Hue: 7.5YR or 10YR
Value: 3 through 5 dry, 2 or 3 moist
Chroma: 1 or 2
Clay content: 15 to 25 percent
Texture: loam, fine sandy loam
Rock fragments content: 0 to 25 percent
Reaction: very strongly acid or strongly acid

Cg1 Horizon:
Hue: 7.5YR or 10YR
Value: 4 through 6 dry, 3 or 4 moist
Chroma: 1 or 2
Clay content: 5 to 20 percent
Texture: stratified loam, sandy loam, loamy sand
Rock fragments content: 0 to 25 percent
Reaction: very strongly acid or strongly acid

Cg2 Horizon:
Hue: 7.5YR or 10YR
Value: 4 through 6 dry, 3 or 4 moist
Chroma: 1 or 2
Clay content: 1 to 15 percent
Texture: very gravelly sandy loam, very gravelly loamy sand
Rock fragments content: 35 to 60 percent
Reaction: very strongly acid to moderately acid

(*NOTE: Terric Cryofibrists vary from loamy to loamy-skeletal, dysic to euic, and mixed to paramicaceous families. Terric Cryofibrists cannot be classified at the series level because of the variabilities at the family level.)

Tileston Series

Setting

Depth class: Very deep
Drainage class: Well drained
Parent material: Colluvium and till from granitic rocks, gneiss, and schist
Landform: Glaciated mountain slopes and moraines
Landform position: Backslopes
Elevation: 9,000 to 10,500 feet
Slope: 10 to 40 percent
Average annual precipitation: 24 to 40 inches
Average annual air temperature: 36 to 42 degrees F
Frost-free period: 30 to 70 days

Taxonomic class: Loamy-skeletal, isotic Typic Glossocryalfs

Typical Pedon

Tileston very cobbly sandy loam, in an area of Tileston very cobbly sandy loam, 10 to 40 percent slopes, about 0.5 mile east of Finch Lake in Wild Basin of Rocky Mountain National Park; located about 600 feet west and 1,600 feet south of the northeast corner of sec. 32, T 3 N, R 73 W; USGS Allens Park topographical quadrangle; latitude 40 degrees, 11 minutes, 03 seconds N; longitude 105 degrees, 34 minutes, 57 seconds W, NAD 1927.

Oe—0 to 3 inches; moderately decomposed plant material

E—3 to 7 inches; light gray (10YR 7/2) very cobbly sandy loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky and moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and few medium and coarse roots; 20 percent gravel, 20 percent cobbles, and 15 percent stones; very strongly acid (pH 4.8); clear wavy boundary.

E/B—7 to 13 inches; 80 percent light gray (10YR 7/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist (E); weak fine subangular blocky and moderate medium granular structure; 20 percent yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist (Bt); weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium and coarse roots; 25 percent gravel, 10 percent cobbles, and 5 percent stones; 80 percent of the total volume is tongues of albic material; very strongly acid (pH 4.6); clear wavy boundary.

B/E—13 to 28 inches; 75 percent brown (7.5YR 5/4) extremely cobbly sandy clay loam, brown (7.5YR 4/4) moist (Bt); moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine to coarse roots; common distinct patchy clay films on faces of peds and few distinct patchy clay bridging on faces of peds and in pores; 25 percent pale brown (10YR 6/3) extremely cobbly sandy loam, brown (10YR 5/3) moist (E); 25 percent gravel, 40 percent cobbles, and 10 percent stones; very strongly acid (pH 4.6); clear wavy boundary.

Bt—28 to 36 inches; brown (7.5YR 5/4) extremely cobbly sandy clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; few fine and medium roots; common distinct continuous clay films on faces of peds; 25 percent gravel and 30 percent cobbles and 20 percent stones; very strongly acid (pH 4.6); clear smooth boundary.

BC—36 to 64 inches; reddish yellow (7.5YR 6/6) extremely cobbly sandy loam, strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; 25 percent gravel and 25 percent cobbles and 15 percent stones; very strongly acid (pH 4.6).

Range in Characteristics

(*Note: Depths given are measured from the mineral soil surface.)
Soil moisture regime: Udic
Mean annual soil temperature: 36 to 40 degrees F
Mean summer soil temperature: 40 to 44 degrees F
Depth to albic horizon: 0 to 4 inches
Depth to glossic horizon: 3 to 11 inches
Depth to the base of the argillic horizon: 24 to 50 inches
Base saturation: 30 to 50 percent
Particle-size control section (weighted average):
Clay content: 18 to 27 percent
Sand content: 55 to 70 percent
Rock fragments content: 50 to 75 percent
Mica content: 15 to 30 percent mica (by grain count)

E Horizon:
Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 or 5 moist

Chroma: 2 or 3
Clay content: 8 to 18 percent
Rock fragments content: 35 to 60 percent

E/B Horizon:
Hue: 7.5YR or 10YR
Value: (E) 6 or 7 dry, 4 or 5 moist
Value: (B) 5 or 6 dry, 4 or 5 moist
Chroma: (E) 2 or 3
Chroma: (B) 4 through 6
Texture: very gravelly sandy loam, very gravelly sandy clay loam
Clay content: 10 to 25 percent
Rock fragments content: 35 to 60 percent
Reaction: very strongly acid or strongly acid

B/E Horizon:
Hue: 7.5YR or 10YR
Value: (Bt) 5 or 6 dry, 4 or 5 moist
Value: (E) 6 or 7 dry, 4 through 6 moist
Chroma: (Bt) 4 through 6
Chroma: (E) 2 or 3
Texture: extremely cobbly sandy clay loam, extremely cobbly sandy loam
Clay content: (Bt) 20 to 30 percent
Clay content: (E) 10 to 20 percent
Rock fragments content: 35 to 75 percent
Reaction: very strongly acid or strongly acid

Bt Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 4 through 6
Texture: extremely cobbly sandy clay loam, extremely cobbly sandy loam
Clay content: 18 to 30 percent
Rock fragments content: 60 to 75 percent
Reaction: very strongly acid or strongly acid

BC Horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 4 through 6
Texture: extremely cobbly sandy loam, extremely cobbly coarse sandy loam, extremely cobbly loamy coarse sand
Clay content: 5 to 15 percent
Rock fragments content: 60 to 75 percent
Reaction: very strongly acid or strongly acid

Tonahutu Series

Setting

Depth class: Very deep
Drainage class: Well drained
Landform: Moraines
Landform position: Backslopes
Parent material: Gravelly till derived from granite, gneiss, and schist
Elevation: 8,700 to 11,000 feet
Slope: 15 to 50 percent

Average annual precipitation: 24 to 34 inches
Average annual temperature: 38 to 42 degrees F
Frost-free period: 30 to 70 days

Taxonomic class: Loamy-skeletal, mixed, superactive Lamellic Haplocryalfs

Typical Pedon

Tonahutu very gravelly sandy loam, in an area of Tonahutu very gravelly sandy loam, 15 to 30 percent slopes, about 1.1 miles northeast of Kawaneeche visitors center in Rocky Mountain National Park, about 2,100 feet north and 800 feet east of the southwest corner of sec. 29, T 4 N, R 75 W; USGS Grand Lake topographic quadrangle; latitude 40 degrees, 16 minutes, 39 seconds N; longitude 105 degrees, 49 minutes, 18 seconds W, NAD 1927.

Oe—0 inches to 1 inch; moderately mostly decomposed moss and needles.

E—1 inch to 6 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic, many medium and coarse roots, common very fine and fine roots; 25 percent gravel and 11 percent cobble; strongly acid (pH 5.2); abrupt smooth boundary.

E and Bt1—6 to 21 inches; 65 percent pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; and 35 percent lamellae of light yellowish brown (10YR 6/4), very gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots, few medium and coarse; few distinct discontinuous clay bridging between sand grains and in root channels and pores; total thickness of lamellae is 1 inch; 40 percent gravel; moderately acid (pH 5.6); clear wavy boundary.

E and Bt2—21 to 35 inches; 55 percent pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; and 45 percent lamellae of light yellowish brown (10YR 6/4), very gravelly sandy clay loam, dark yellowish brown (10YR 5/4) moist; slightly hard, friable, slightly sticky and slightly plastic; few fine and coarse roots; common distinct discontinuous clay bridging between sand grains and in root channels and pores; total thickness of lamellae is 3 inches; 40 percent gravel; moderately acid (pH 6.0); clear wavy boundary.

Bt and E—35 to 45 inches; 70 percent lamellae of strong brown (7.5YR 5/6) very gravelly sandy clay loam, strong brown (7.5YR 4/6) moist; 25 percent pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few very fine to coarse roots; common distinct discontinuous clay bridging between sand grains and in root channels and pores; total thickness of lamellae is 2.5 inches; 45 percent gravel and 5 percent cobbles; slightly acid (pH 6.2); clear wavy boundary.

BC—45 to 62 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft; very friable, nonsticky and nonplastic; few fine to coarse roots; 45 percent gravel and 10 percent cobbles; slightly acid (pH 6.4).

Range in Characteristics

(*Note: Depths given are measured from the mineral soil surface.)
Soil moisture regime: Udic
Average annual soil temperature: 36 to 40 degrees F
Average summer soil temperature: 43 to 47 degrees F
Depth to lamellae: 6 to 24 inches

Thickness of the lamellae (total): 6 to 20 inches
Base saturation: 60 to 85 percent
Particle-size control section (weighted average):
Clay content: 10 to 18 percent
Sand content: 55 to 80 percent
Rock fragment content: 35 to 50 percent
Mica content: 15 to 30 percent (by grain count)

E Horizon:
Hue: 7.5YR or 10YR
Value: 6 to 8 dry, 4 to 6 moist
Chroma: 2 or 3
Clay content: 10 to 18 percent
Rock fragments content: 35 to 60 percent
Reaction: strongly acid or moderately acid

E and Bt Horizons:
Hue: 7.5YR or 10YR
Value: (E) 6 or 7 dry, 4 to 6 moist
Value: (Bt) 5 or 6 dry, 4 or 5 moist
Chroma: (E) 2 or 3
Chroma: (Bt) 3 to 6
Texture: (E) very gravelly sandy loam, very gravelly coarse sandy loam
Texture: (Bt) very gravelly sandy loam, very gravelly sandy clay loam
Clay content: 5 to 18 percent (E), 15 to 27 percent (Bt)
Rock fragments content: 35 to 60 percent
Base saturation: 60 to 85 percent
Reaction: strongly acid to slightly acid

Bt and E Horizons:
Hue: 7.5YR or 10YR
Value: (Bt) 5 or 6 dry, 4 or 5 moist
Value: (E) 6 or 7 dry, 4 to 6 moist
Chroma: (Bt) 3 to 6
Chroma: (E) 2 or 3
Texture: (Bt) very gravelly sandy loam, very gravelly sandy clay loam
Texture: (E) very gravelly sandy loam, very gravelly coarse sandy loam
Clay content: 15 to 27 percent (Bt), 5 to 18 percent (E)
Rock fragments content: 35 to 60 percent
Base saturation: 60 to 85 percent
Reaction: moderately acid or slightly acid

BC Horizons:
Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 6
Texture: very gravelly sandy loam, very gravelly loamy sand
Clay content: 5 to 15 percent
Rock fragments content: 35 to 60 percent
Reaction: moderately acid to neutral

Trailridge Series

Setting

Depth class: Shallow
Drainage class: Somewhat excessively drained

Parent material: Slope alluvium and residuum from granite, gneiss, and schist
Landform: Mountain
Landform position: Summits and shoulders
Slope: 10 to 60 percent
Elevation: 10,400 to 12,500 feet
Average annual precipitation: 30 to 40 inches
Average annual air temperature: 34 to 38 degrees F
Frost-free period: 10 to 30 days

Taxonomic class: Loamy-skeletal, paramicaceous, shallow Humic Dystrocryepts

Typical Pedon

Trailridge extremely gravelly sandy loam, in an area of Trailridge-Mummy complex, 20 to 60 percent slopes, about 1 mile east of Fall River Pass in Rocky Mountain National Park; USGS Trail Ridge topographic quadrangle; latitude 40 degrees, 26 minutes, 40 seconds N; longitude 105 degrees, 44 minutes, 14 seconds W, NAD 1927.

A1—0 to 6 inches; dark grayish brown (10YR 4/2) extremely gravelly sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; 55 percent gravel and 10 percent cobbles; very strongly acid (pH 5.0); abrupt smooth boundary.
A2—6 to 11 inches; very dark grayish brown (10YR 3/2) extremely gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; 55 percent gravel and 10 percent cobbles; very strongly acid (pH 4.8); abrupt smooth boundary.
Bw—11 to 19 inches; yellowish brown (10YR 5/4) extremely gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak very fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; 60 percent gravel and 15 percent cobbles; very strongly acid (pH 4.8); clear smooth boundary.
Cr—19 to 29 inches; weathered schist.

Range in Characteristics

Soil moisture regime: Udic
Mean annual soil temperature: 32 to 36 degrees F
Mean summer soil temperature: 43 to 47 degrees F
Thickness of the umbric epipedon: 7 to 20 inches
Depth to paralithic contact: 10 to 20 inches
Base saturation: 30 to 50 percent
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Sand content: 45 to 70 percent
Mica content: 40 to 70 percent (by grain count)

A Horizon:
Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 1 to 3
Clay content: 8 to 18 percent
Rock fragment content: 60 to 70 percent
Reaction: very strongly acid or strongly acid

Bw Horizon:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 or 4 moist
Chroma: 3 to 6
Texture: extremely gravelly sandy loam, extremely gravelly coarse sandy loam
Clay content: 8 to 18 percent
Rock fragment content: 60 to 80 percent
Reaction: very strongly acid to moderately acid

Venable Series

Setting

Depth class: Very deep
Drainage class: Poorly drained
Parent material: Alluvium from granite, gneiss, and schist
Landform: Flood plains
Seasonal high water table: 6 to 20 inches
Slope: 0 to 1 percent
Elevation: 8,200 to 9,000 feet
Average annual precipitation: 16 to 24 inches
Average annual air temperature: 38 to 42 degrees F
Frost-free period: 50 to 75 inches

Taxonomic class: Fine-loamy, mixed, superactive Cumulic Cryaquolls

Typical Pedon

Venable loam, in an area of Venable loam, 0 to 1 percent slope; about 1,900 feet east and 1,800 feet north of the southwest corner of sec. 29, T 5 N, R 73 W in Beaver Meadows; USGS Longs Peak topographic quadrangle; latitude 40 degrees, 22 minutes, 13 seconds N; longitude 105 degrees, 36 minutes, 2 seconds W, NAD 1927.

Oe—0 to 3 inches; moderately decomposed organic material.

A—3 to 9 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 5 percent gravel; moderately acid (pH 6.0); clear smooth boundary.

Ag—9 to 14 inches; very dark gray (7.5YR 3/1) loam, black (7.5YR 2/1) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 5 percent gravel; few fine prominent dark reddish brown (2.5YR 3/3) iron concentrations; slightly acid (pH 6.2); abrupt wavy boundary.

Bg—14 to 31 inches; gray (N 5/0) sandy clay loam, very dark gray (N 3/0) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; 10 percent gravel; common fine prominent reddish brown (5YR 4/4) iron concentrations; moderately acid (pH 5.8); clear wavy boundary.

2Cg1—31 to 43 inches; gray (N 5/0) gravelly loamy coarse sand, dark gray (N 4/0) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; 20 percent gravel; neutral (pH 6.8); abrupt smooth boundary.

3Cg2—43 to 63 inches; greenish gray (5GY 6/1) very cobbly silty clay loam, greenish gray (5GY 5/1) moist; common medium prominent yellowish red (5YR 4/6) mottles; massive; very hard, firm, sticky and plastic; few very fine roots; 20 percent gravel and 25 percent cobbles; neutral (pH 6.6).

Range in Characteristics

Soil moisture regime: Aquic
Mean annual soil temperature: 36 to 40 degrees F
Thickness of the mollic epipedon: 20 to 50 inches
Particle-size control section (weighted average):
  Clay content: 18 to 30 percent
  Sand content: 40 to 70 percent
  Rock fragments content: 10 to 20 percent in the control section
  Mica content: 15 to 30 percent (by grain count)

Ag Horizon:
  Hue: 7.5YR or 10YR
  Value: 3 or 4 dry, 2 or 3 moist
  Chroma: 1 or 2
  Clay content: 18 to 25 percent
  Reaction: moderately acid to neutral

Bg Horizon:
  Hue: 10YR or neutral
  Value: 4 or 5 dry, 3 or 4 moist
  Chroma: 0 or 1
  Texture: sandy clay loam, loam
  Clay content: 20 to 30 percent
  Reaction: moderately acid to neutral

2Cg1 Horizon:
  Hue: 5GY or neutral
  Rock fragments content: 10 to 30 percent
  Texture: gravelly loamy coarse sand, gravelly loamy sand
  Clay content: 3 to 10 percent
  Reaction: moderately acid to neutral

3Cg2 Horizon:
  Hue: 5GY or neutral
  Rock fragments content: 35 to 50 percent
  Texture: very cobbly silty clay loam, very cobbly clay loam, very cobbly loam
  Clay content: 27 to 35 percent
  Reaction: moderately acid to neutral

(*NOTE: The Venable soils in this survey area are taxadjuncts because there is a thin sandy horizon in the lower part of the particle-size control section. In this area, the Venable series is in the fine-loamy over sandy or sandy skeletal family. This difference, however, does not significantly affect the use, management, or interpretations of the soils.)

Ypsilon Series

Setting

Depth class: Very deep
Drainage class: Somewhat excessively drained
Parent material: Colluvium and till derived from granitic rocks, gneiss, and schist
Landform: Glaciated mountain slopes and moraines
Landform position: Backslopes and footslopes
Elevation: 9,700 to 11,000 feet
Slope: 20 to 50 percent
Average annual precipitation: 30 to 40 inches

Average annual air temperature: 35 to 38 degrees F
Frost-free season: 20 to 50 days

Taxonomic class: Loamy-skeletal, isotic Typic Haplocryods

Typical Pedon

Ypsilon gravelly sandy loam, in an area of Ypsilon gravelly sandy loam, 20 to 50 percent slopes, about 1.1 miles south of Rainbow Curve in Rocky Mountain National Park; USGS Trailridge topographical quadrangle; latitude 40 degrees, 23 minutes, 04 seconds N; longitude 105 degrees, 39 minutes, 49 seconds W, NAD 1927.

Oe—0 to 6 inches; moderately decomposed plant material.

E1—6 to 14 inches; light gray (10YR 7/2) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium and many very fine and few coarse roots; 20 percent gravel and 2 percent cobbles; very strongly acid (pH 4.9); clear wavy boundary.

E2—14 to 19 inches; light gray (10YR 7/2) very cobbly coarse sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few coarse and medium and many very fine and fine roots; 25 percent gravel and 15 percent cobbles; very strongly acid (pH 4.8); clear wavy boundary.

Bs1—19 to 24 inches; brown (7.5YR 5/4) very cobbly coarse sandy loam, strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure; very hard, firm, moderately cemented by iron, brittle, slightly sticky and nonplastic; few medium and coarse and common fine roots; common distinct continuous iron stains on faces of peds; 20 percent gravel, 15 percent cobbles, and 5 percent stones; very strongly acid (pH 4.8); gradual smooth boundary.

Bs2—24 to 35 inches; brown (7.5YR 5/4) extremely stony sandy loam, brown (7.5YR 4/4) moist; weak coarse subangular blocky and moderate fine subangular blocky structure; hard, firm, weakly cemented by iron, brittle, slightly sticky and slightly plastic; few fine to coarse roots; few distinct continuous iron stains on faces of peds; 20 percent gravel, 25 percent cobbles, and 30 percent stones; very strongly acid (pH 4.7); gradual smooth boundary.

BC—35 to 67 inches; light yellowish brown (10YR 6/4) extremely cobbly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; massive; hard, very friable, nonsticky and nonplastic; few medium roots; 20 percent gravel and 30 percent cobbles and 10 percent stones; very strongly acid (pH 4.7).

Range in Characteristics

(*Note: Depths given are measured from the mineral soil surface.)
Soil moisture regime: Udic
Mean annual soil temperature: 34 to 36 degrees F
Mean summer soil temperature: 40 to 43 degrees F
Depth to spodic materials: 6 to 14 inches
Thickness of the spodic horizon: 15 to 25 inches
Thickness of the solum: 30 to 48 inches
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Sand content: 50 to 75 percent
Rock fragments content: 45 to 65 percent
Mica content: 15 to 30 percent (by grain count)

E1 Horizon:
Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 or 5 moist

Chroma: 1 or 2
Clay content: 8 to 18 percent
Rock fragments content: 15 to 35 percent, dominantly gravel and cobbles
Acid oxalate extractable Al + 1/2 Fe: .10 to .15 percent
Organic carbon: 0.5 to 1 percent
Base saturation: 15 to 35 percent
Reaction: extremely acid to strongly acid

E2 Horizon:
Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 or 5 moist
Chroma: 1 through 3
Texture: very cobbly coarse sandy loam, very cobbly sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 35 to 60 percent, dominantly gravel and cobbles
Acid oxalate extractable Al + 1/2 Fe: .25 to .40 percent
Organic carbon: 0.5 to 1.0 percent
Base saturation: 15 to 35 percent
Reaction: extremely acid or very strongly acid

Bs Horizons:
Hue: 5YR or 7.5YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 through 6
Texture: very cobbly coarse sandy loam, very cobbly sandy loam, extremely stony coarse sandy loam, extremely stony sandy loam
Clay content: 8 to 18 percent
Rock fragments content: 35 to 75 percent, dominantly cobbles and gravel
Acid oxalate extractable Al + 1/2 Fe: .60 to .80 percent
Organic carbon: 1.0 to 1.5 percent
Base saturation: 15 to 50 percent
Reaction: extremely acid or very strongly acid

BC Horizon:
Hue: 7.5YR or 10YR
Value: 5 through 7 dry, 4 through 6 moist
Chroma: 3 through 6
Texture: extremely cobbly loamy coarse sand, extremely cobbly loamy sand
Clay content: 1 to 5 percent
Rock fragments content: 60 to 75 percent, dominantly cobbles and gravel
Acid oxalate extractable Al + 1/2 Fe: 15 to .40 percent
Organic carbon: 0.5 to 1 percent
Base saturation: 30 to 50 percent
Reaction: very strongly acid or strongly acid

Formation of the Soils

Five important factors determine the rate and nature of soil development and their separate soil horizons. These factors are the composition of the *parent material*; the *climate* under which the soil material accumulated and weathered; *living organisms* on and in the soil; *relief*, or the lay of the land; and the length of *time* that the forces of soil formation have acted on the soil material. The relative effect of these factors varies from one locale to another.

Climate and vegetation are the dynamic and active factors of soil formation. They alter the accumulated soil material and bring about the development of genetically related soil horizons. Relief, mainly through its influence on temperature and runoff or run-on, modifies the effects of climate and vegetation. The parent material also affects the kind of profile that forms and, in extreme cases, determines it nearly in its entirety. Lastly, time is needed to modify the parent material into a soil. A long period of time generally is required for the development of distinct soil horizons.

Parent material undergoes many changes over time. Soil begins to form into a sequence of distinct horizons as soon as the parent material is deposited, settled, and stabilized with adaptive vegetation. The horizons vary in color, texture, chemical characteristics, structure, and other properties. The basic processes of horizon differentiation include additions, removals, transfers, and transformations of substances in the soil. Some forms of these processes promote differentiation, and others retard or slow those processes down.

In the early stages of soil formation, the soil properties are largely inherited from the parent material. Organic matter accumulates in the surface layer if conditions favor stability of humus, and the A horizon darkens with this accumulation. As time passes, a B horizon develops if the landform remains stable and the climate favorable. In a B horizon, the soil material collectively aggregates into a cohesive structure (blocky) and generally becomes more clayey as a result of the accumulation of silicate clays in these subsoil horizons. These subsoil horizons usually tend to become redder in hue as a result of the enrichment of iron oxides. Leaching affects soil from downward percolation of water from snowmelt and/or rainwater, and affects the pH level of each horizon in relation to other horizons.

Many other chemical and physical changes occur in parent material and in young soils. These changes affect the development of the soils. The rate of maturation varies greatly from place to place: in this survey area, from north-facing slopes to south-facing slopes. In some positions on the landscape, the soils may not have an opportunity to age.

Parent Material

A wide diversity of color, mineralogy, reaction, and other physical and chemical properties are evident in the parent materials in the Rocky Mountain National Park soil survey area. This diversity is due to chemical reactions and leaching from precipitation events downward into the soil profiles. Igneous and metamorphic rocks are the dominant rock sources. The method of material accumulation also is a factor in determining such soil characteristics as the content of rocks and stratification.

In the survey area there are two main kinds of parent material: *residual* and *transported*. The residual material result from decomposition and weathering of rocks in place. The transported materials include alluvium, colluvium, periglacial frost action, glacial outwash, and glacial till.

Alluvium.

Alluvium is the transported material in the survey area. The flood plains of the streams consist of deposited Pleistocene aged materials and recent deposited alluvium of Holocene age.

Examples of soils that formed in recent alluvium are Dystrocryepts, Kawuneeche, and Venable. These soils reflect the variety in strata laid down periodically, one on top of another, by streams. The Dystrocryepts soils occur closest to the stream channels and have a wide variety of stratification with clays and fine sands to coarse gravel to depths of 60 inches or more. The Venable soils have an irregular decrease of organic material in the upper 31 inches, consistent saturation due to high water table, and generally have dark colors due to the dense grass and grass-like vegetation returning high quantities of organic material to the soil profile. The underlying material consists of gravelly loamy coarse sands and very cobbly silty clay loam.

Colluvium.

Colluvium is an important type of parent material on steep mountain slopes and fans. On some of the steepest mountain slopes this material is less than 20 inches thick. More commonly, however, it is 60 inches thick or deeper.

Colluvium generally includes a high content of rock fragments. The fragments are derived from igneous and metamorphic rocks. The fine-earth portion and, therefore, most physical and chemical characteristics of the material are determined by the kind of source rock. For example, colluvium derived from igneous and metamorphic rocks generally is more sandy than material derived from eolian materials.

Woodland soils on mountain slopes include Enentah, Granile, Fallriver, Mummy, Tilestone, and Ypsilon. These series are very deep soils. The Granile and Tileston soils show a significant degree of soil development. Alpine tundra soils include Mummy.

Residuum.

Residuum is a dominant type of parent material in many areas in the mountains of the survey area. It is extensive on mountain slopes, structural benches, and mountaintops. Schist, gneiss, and granite are particularly important rock types in the soil survey area. The nature of the residual parent material and of the soils that formed in it depends to a great extent upon the source rock. Schist and granites yield a relatively high proportion of sand and limited quantities of clay and, generally, a relatively low amount of silt. Examples of these types of woodland soils are Bullwark, Catamont, Galuche, Hiamovi, Legault, and Rofork. Examples of these types of mixed grass-woodland soils are Rofork and Chasmfalls. An example of alpine tundra soils are Trailridge.

Periglacial.

These types of parent material are characteristic of a past, much colder climate that can demonstrate extreme freeze-thaw features on the landscape. Surficial features on mountain slopes and ridges depict patterned ground of large soil polygons with sorted rock stripes (rocks oriented in narrow channels) alongside polygons, solifluction terraces, talus cones, and cryoturbation flow structures that are named stone-lobed terraces (Bennedict, 1970). Examples of these soils are the Enentah, Fallriver, Mummy, Nanita, Onahu, and Tonahutu.

Glacial Outwash and Till.

These types of parent material are in the survey area. The materials generally consist of a high volume content of rounded cobbles, stones, and pebbles. The fine-earth fraction has a high content of sand, a relatively low content of silt, and limited amounts of clay. Some of these soils exhibit clay movement into thin lenses in the subsoils called lamella. Examples of these soils are the Fallriver, Isolation, Nanita, Onahu, Peeler, Tileston, and Tonahutu series.

Climate

Climate affects soil formation through its influence on the kind and amount of vegetation that grows, on the rate at which minerals weather, on the activity level of the micro-organisms, and on runoff and erosion.

Precipitation and temperature are the most important climatic factors, but wind frequency and velocity, humidity, and the amount of cloud cover also can and do impact soil formation.

The amount of precipitation that actually infiltrates downward in the soil profile is critical to the rate of weathering. Water is the medium in which chemical reactions take place. Water also is the main source of hydrogen, a principal agent of weathering. Downward-moving water carries end products of chemical and biochemical reactions. The depth of weathering and the depth to which materials move through the soil depend to a great extent on the effective precipitation. Temperature directly influences the rate of chemical and biological processes. In the higher elevations, many of the chemical and biological reactions are dramatically slowed.

The survey area includes three distinct climatic zones: the lower mountains or *montane zone*, the *subalpine zone* of the high mountains, and the *alpine zone* of the very high mountains.

The precipitation of the montane zone is 16 inches to about 24 inches, with warm summer days and cool nights. The growing season is 40 to 100 days. South-facing slopes are shrubs, forbs, and grasses with scattered overstory of ponderosa pine and Rocky Mountain juniper. North-facing slopes are cooler with less grass and shrubs in the understory and more Rocky Mountain Douglas-fir and ponderosa pine. Less soil moisture is lost due to evaporation; snowfall will remain longer than on the south-facing slopes. Plant transpiration is reduced on the more shaded and protected slopes that are north-facing.

For the soils of the high mountains, the subalpine zone, the average annual precipitation is 24 to 40 inches. The average temperatures are cool. In most cases the growing season is 10 to 50 days. Soil development, that specific to diagnostic sub-horizons, may be slower in development due to the colder soils and slowed chemical reactions. Decomposition of organic materials such as needles and leaves is also slowed, creating duff layers as thick as 4 inches. E horizons can be indicative of higher effective precipitation and acidic leaching processes in the high mountain soils.

For the soils of the very high mountains or tundra, the alpine zone, the average annual precipitations is 30 to 40 inches. The average temperatures are cold. The growing season is 10 to 30 days. Soil development is very slow due to cold temperatures.

Living Organisms

Plants and animals are important factors of soil development. Dead plants and animals are decomposed by microorganisms and other soil fauna as food and returned to the soil material. These process result in the recycling of the nutrients used by plants, the addition of organic matter, and a color darkening of the upper part of the soil. Through burrowing activities small animals, earthworms, and other insects can retard the development of distinct soil horizons by mixing soil layers. Soil microorganisms influence the development of soil structure. Nitrogen is added to the soil by microorganisms alone or in association with specific plant species that fix nitrogen on the plant roots.

Living vegetation helps to control erosion by stabilizing the soil surface with roots and rhizome structures, and is a host for fungi hyphae that exude polysaccharide-compounds that “glue” soil aggregates together. Plant roots form nearly-vertical channels and increase the penetration of water and air into the soil. The canopy cover of trees and shrubs shades the soil and reduces soil temperature. In turn, the rate of evaporation of soil moisture is reduced, although cooler soil temperatures result in slower chemical processes and biochemical reactions.

Coniferous forests are dominant in the mountains at the higher elevations where the annual precipitation is 24 to 40 inches. The acidic litter of the conifers causes the leaching of silicate clays, some silt, and other minerals. Organic matter in this environment usually breaks down rapidly and only small amounts accumulate. These factors result in the formation of Alfisols, Inceptisols, and Spodosols such as Catamont, Enentah, Fallriver, Granile, Peeler, Tileston, Tonahutu, and Ypsilon soils.

Different soils have developed in the adjacent areas that support grasses instead of trees. Organic matter, or humus, resulting from decomposition of the grasses is more stable than that resulting from the needles from trees. This type of organic material accumulates more readily as vegetation is recycled. Soils in these areas have thicker, dark surface layers and are classified as Mollisols. Cathedral, Chasmfalls, Isolation, Lumpyridge, Rofork, and Venable soils are examples of Mollisols.

Soils in the lower montane zone commonly have a cover of grasses, shrubs, forbs, and scattered trees. The precipitation is less than in the alpine and subalpine zones, but more biomass can be returned to the soil. The shallow to bedrock soils will have a dark colored surface layer but not as thick as that on deep or very deep soils. Cathedral and Rofork soils are examples. The deeper soils are Chasmfalls, Isolation, and Lumpyridge soils.

Relief

Relief affects the development of distinct soil horizons through its influence on soil drainage, erosion or deposition, soil temperature, and effective precipitation and runoff. The relief of the soil survey area is diverse, ranging from nearly level stream terraces to very steep mountains.

The potential for runoff and water erosion is low in the areas with lower slopes. Rainfall in these areas tends to percolate down through the soil profile. The movement of relatively greater amounts of water through the soil affects the differentiation of the profile into distinct horizons and results in changes in the mineralogy. Therefore, in soils that formed in the same parent material, the influence of relief can be seen in the differences in soil color, in the thickness of the solum, and in the degree of horizonation.

Low-lying areas often receive both surface runoff and excess moisture from the surrounding mountains or from streams. Some soils on flood plains have fluctuating water tables and poor drainage, which results in reddish-colored accumulations (mottles) and a grayish-colored soil matrix. A fluctuating water table, however, retards such genetic processes as the development of a clayey subsoil. The Venable soils, for example, have grayish colors and do not have a clayey subsoil. In marshy areas where stagnant water collects, the breakdown of organic matter is slowed dramatically and layers of peat build up. Terric Cryofibrists is an example of such a soil.

The effective precipitation in low-lying areas results in lush grassy and grass-like vegetation. If the soil is poorly drained or better, natural recycling of vegetation results in thick surface layer darkened by the build up of humus. Venable soils have a thick, dark surface layer.

In areas that have steep slopes, the potential for runoff and erosion is greater than in the lesser sloping areas. Shallow soils are common in the steeper areas because the soil material may erode almost as rapidly as it weathers from the underlying bedrock. Soils of the Cathedral, Galuche, Hiamovi, Legault, Rofork, and Trailridge series are examples of shallow soils on steep slopes. Soils on steep slopes generally show less pedogenic development than soils in less sloping areas over the same period of time.

Aspect, a factor related to relief, influences soil formation through its effect on soil temperature and the capacity of soils to retain moisture. Soils on north-facing slopes are cooler and retain moisture longer than do soils on south-facing slopes. Therefore, the production of biomass generally is higher on north-facing slopes than on south-facing slopes.

Differences in soil temperature and moisture cause differences in the types of vegetation typically found on the soils. For example, north-facing slopes in the mountains generally have dense stands of conifers. Soils that have bleached subsurface layers are common on north-facing slopes. Examples of soils on north-facing slopes include the Enentah, Fallriver, Nanita, Tileston, and Tonahutu series. On the warmer south-facing slopes, grass and shrubs are the dominant types of vegetation. Cathedral, Chasmfalls, and Lumpyridge soils are examples of soils on south-facing slopes.

Time

Compared to the cycle of human life, a large amount of time is required for genetic development of a soil. In a geologic sense, however, soil genetic processes can be completed in a very short span of time. For example, the development of a thin argillic horizon, or a subsoil in which the clay has accumulated, requires about 300 to 1,000 years.

The length of time required for a genetic process varies greatly from one soil to another because of the differences in climate, topography, parent material, and living organisms. Therefore, over a given period of time a large degree of development may occur in another. Conditions that favor a shorter period of time for development include a warm and humid climate; flat or gently sloping terrain; good internal drainage; unconsolidated parent material such as alluvial or glacial deposits; a moderate amount of clay; low pH; and vegetation that produces acidic residue. Characteristics used to compare the maturity of soils include color, degree of structure in the subsoil, evidence of clay movement, and thickness of the surface layer and subsoil.

Differences in pedogenic development in relation to age are apparent in comparing Chasmfalls and Lumpyridge soils. Both soils formed under the same climate and support similar kinds of vegetation. Chasmfalls soils, however, formed in more recent alluvium. These soils are younger because little profile development has taken place. The underlying material shows little or no evidence of clay accumulation. Lumpyridge soils formed in older alluvium on the fans. The greater amount of time since the deposit has resulted in a greater degree of development than in Chasmfalls. Clays and hydrous oxides have been leached from the surface materials and have accumulated in the subsoil of the Lumpyridge soils.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvial cone. The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

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.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim. (in tables). An area difficult to reclaim after 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.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Basal area. The area of a cross sectin of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

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.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Cirque. A semicircular, concave, bowl-like area that has steep faces primarily resulting from glacial ice and snow abrasion.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or 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 or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Congeliturbate. Soil material disturbed by frost action.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

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.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecological site. A description of the plant community that identifies the dominant species.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (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.

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 does not provide a source of gravel or sand for construction purposes.

Extrusive rock. Igneous rock derived from deep-seated molten (magma) emplaced on the earth's surface.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

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.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. 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 (300 meters) and fringes a mountain range or high-plateau escarpment.

Footslope. The inclined surface at the base of a hill.

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.

Fragile (in tables). A soil that is easily damaged by use and disturbance.

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 drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits. 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.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A 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.

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.

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. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil 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, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

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.

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 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.

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.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lamellae. A thin illuvial horizon consisting of accumulation of clay minerals occurring as horizontal lenses. It has more clay than overlying eluvial horizons and is usually in the subsoil.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

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.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Mountain base. The lower part of a mountain that is generally less sloping. It is usually the lower part of the backslope or footslope.

Mountain flank. The middle part of a mountain that comprises the main part of a mountain side. It is usually the backslope.

Mountain slope. The part of a mountain between the summit and the foot.

Mountain top. The upper part of a mountain. It is usually the shoulder or summit.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly. The slow movement of water through the soil adversely affects the specified use.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as “saturated hydraulic conductivity,” which is defined in the “Soil Survey Manual.” In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as “permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 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 flooding.

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.

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 or very rapid permeability, the soil may not adequately filer 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.

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.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed 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:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

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.

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. Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone (in tables). The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

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.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

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. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

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 (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

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.

Slow intake (in tables). The slow movement of water into 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.

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 separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25

Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spodic horizon. An illuvial layer that is composed of accumulations of iron, aluminum, and organic matter. It is usually the subsoil.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

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.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer; or, any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. A general term for the top or the highest area of a landform.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

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 outermost inclined surface at the base of a hill; part of a footslope.

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.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder the establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Umbric epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has low base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Upland. 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.

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.

Windthrow. The action of uprooting and tipping over trees by wind.

Tables

Table 1.--Temperature and precipitation

(Recorded in the period 1971-2000 at Grand Lake, CO 3496)

Month	Temperature (Degrees F.)						Precipitation (Inches)				
				2 yrs in 10 will have				2 yrs.in 10 will have			
	avg. daily max	avg. daily min	avg.	max. temp. >than	min. temp. <than	avg. # of grow. deg. days*	avg.	less than	more than	avg. # of days w/.1 or more	avg. total snow-fall
January	31.5	3.6	17.6	50	-28	0	1.83	0.88	2.68	6	31.0
February	36.3	5.6	21.0	52	-25	0	1.52	0.73	2.07	5	21.7
March	42.5	12.7	27.6	59	-15	2	1.53	0.91	2.09	5	16.5
April	49.6	19.5	34.5	68	-6	23	1.97	1.26	2.62	5	15.9
May	59.6	27.8	43.7	75	12	144	2.05	1.08	3.01	6	4.4
June	70.9	33.9	52.4	84	22	369	1.49	0.69	2.25	4	0.8
July	75.9	38.9	57.4	87	28	534	2.10	1.15	3.03	6	0.0
August	74.1	37.5	55.8	86	26	481	2.15	1.08	3.17	6	0.0
September	67.7	31.0	49.4	83	15	285	1.68	0.82	2.50	4	0.5
October	56.7	22.8	39.7	72	2	75	1.50	0.66	2.32	4	6.2
November	40.0	12.7	26.4	60	-14	1	1.37	0.87	1.79	4	20.3
December	32.1	4.4	18.2	50	-24	0	1.59	0.72	2.37	5	25.9
Yearly :											
Average	53.1	20.9	37.0	---	---	---	----	----	----	---	---
Extreme	92	-37	---	89	-32	---	----	----	----	---	---
Total	---	---	---	---	---	1914	20.77	17.47	23.69	60	143.3

Average number of days per year with at least 1 inch of snow on the ground: 158

Table 1.--Temperature and precipitation

(Recorded in the period 1971-1994 at Estes Park, CO 2759)

Month	Temperature (Degrees F.) avg. daily max	avg. daily min	avg.	2 yrs in 10 will have max. temp. >than	2 yrs in 10 will have min. temp. <than	avg. # of grow. deg. days*	Precipitation (Inches) avg.	2 yrs. in 10 will have less than	2 yrs. in 10 will have more than	avg. # of days w/.1 or more	avg. total snow-fall
January	38.4	16.1	27.3	57	-20	8	0.33	0.07	0.54	1	4.5
February	40.8	17.5	29.2	58	-18	12	0.49	0.12	0.79	1	7.6
March	46.1	22.5	34.3	64	-6	36	0.94	0.30	1.40	2	8.3
April	53.7	27.4	40.6	72	-2	107	1.33	0.58	1.98	3	4.6
May	62.2	34.7	48.4	78	18	268	1.94	0.92	2.78	4	0.6
June	73.1	41.4	57.3	87	29	518	1.44	0.53	2.31	3	0.1
July	78.2	46.5	62.4	90	36	694	2.28	1.27	3.29	5	0.0
August	76.4	44.8	60.6	86	34	638	1.87	0.68	2.96	5	0.0
September	69.6	38.1	53.9	83	19	418	1.17	0.51	1.75	3	0.6
October	59.4	30.1	44.7	76	6	189	0.91	0.32	1.41	2	1.2
November	45.0	22.4	33.7	66	-8	45	0.70	0.19	1.16	1	4.3
December	39.1	16.2	27.7	59	-17	13	0.36	0.13	0.55	1	3.5
Yearly :											
Average	56.8	29.8	43.3	---	---	---	----	----	----	---	---
Extreme	96	-34	---	90	-26	---	----	----	----	---	---
Total	---	---	---	---	---	2945	13.76	9.43	15.82	31	35.4

Average # of days per year with at least 1 inch of snow on the ground: 11

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minumum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold : 40.0 degrees F).

Table 2.--Freeze dates in spring and fall

(Recorded in the period 1961-1990 at Grand Lake, CO 3496)

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----	June 19	July 15	August 2
2 years in 10 later than---	June 13	July 7	July 27
5 years in 10 later than---	June 3	June 24	July 16
First freezing temperature in fall:			
1 yr. in 10 earlier than---	August 22	August 8	July 29
2 yrs. in 10 earlier than--	August 29	August 15	August 3
5 yrs. in 10 earlier than--	September 12	August 28	August 13

Table 2.--Freeze dates in spring and fall

(Recorded in the period 1961-1990 at Estes Park, CO 2759)

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----	May 14	May 29	June 16
2 years in 10 later than---	May 10	May 26	June 12
5 years in 10 later than---	May 4	May 19	June 4
First freezing temperature in fall:			
1 yr. in 10 earlier than---	September 19	September 7	August 28
2 yrs. in 10 earlier than--	September 24	September 11	September 1
5 yrs. in 10 earlier than--	October 4	September 20	September 10

Table 3.--Growing season

(Recorded for the period 1971-2000 at Grand Lake, CO 3496)

	Daily Minimum Temperature		
Probability	# days > 24°F	# days > 28°F	# days > 32°F
9 years in 10	78	43	5
8 years in 10	89	53	16
5 years in 10	111	71	37
2 years in 10	133	90	58
1 year in 10	145	100	68

(Recorded for the period 1971-1994 at Estes Park, CO 2759)

	Daily Minimum Temperature		
Probability	# days > 24°F	# days > 28°F	# days > 32°F
9 years in 10	134	111	84
8 years in 10	141	116	90
5 years in 10	153	127	99
2 years in 10	165	137	109
1 year in 10	171	142	114

Table 4.--Acreage and proportionate extent of the soils

Map symbol	Soil name	Boulder County	Grand County	Larimer County	Total Area	Total Extent
		Acres	Acres	Acres	Acres	Pct.
1	Archrock-Fallriver association, 15 to 50 percent slopes	866	277	2,795	3,938	1.5
2	Archrock-Onahu-Rock outcrop complex, 10 to 75 percent slopes	825	1,844	1,000	3,669	1.4
3	Bullwark-Catamount complex, 20 to 50 percent slopes	---	803	2,087	2,890	1.1
4	Catamount gravelly coarse sandy loam, 5 to 20 percent slopes	505	---	1,632	2,137	0.8
5	Catamount-Bullwark-Rock outcrop complex, 10 to 40 percent slopes	480	---	7,034	7,514	2.8
6	Enentah very stony loam, 10 to 40 percent slopes	---	6,004	---	6,004	2.3
7	Enentah-Rubble land complex, 25 to 70 percent slopes	---	1,353	---	1,353	0.5
8	Fallriver gravelly sandy loam, 10 to 45 percent slopes	1,499	7,992	12,587	22,078	8.3
9	Fallriver gravelly sandy loam, warm, 10 to 45 percent slopes	56	1,132	524	1,712	0.6
10	Fallriver-Hiamovi complex, 10 to 55 percent slopes	675	12,640	7,949	21,264	8.0
11	Fallriver-Rock outcrop complex, 30 to 70 percent slopes	1,556	8,786	5,518	15,860	6.0
12	Galuche-Rock outcrop complex, 20 to 90 percent slopes	---	---	4,554	4,554	1.7
13	Granile very gravelly coarse sandy loam, 30 to 60 percent slopes	---	---	2,254	2,254	0.8
14	Hiamovi-Rock outcrop complex, 5 to 40 percent slopes	711	1,374	1,902	3,987	1.5
15	Hiamovi-Rock outcrop complex, 15 to 80 percent slopes	506	9,590	3,036	13,132	4.9

See footnote at end of table.

Table 4.--Acreage and proportionate extent of the soils--Continued

Map symbol	Soil name	Boulder County	Grand County	Larimer County	Total Area	Total Extent
		Acres	Acres	Acres	Acres	Pct.
16	Isolation gravelly sandy loam, 5 to 35 percent slopes	321	---	1,693	2,014	0.8
17	Kawuneeche loam, 0 to 1 percent slopes	---	160	319	479	0.2
18	Kawuneeche mucky peat, 0 to 4 percent slopes	---	3,401	---	3,401	1.3
19	Kawuneeche mucky peat, low precipitation, 0 to 1 percent slopes	---	---	1,096	1,096	0.4
20	Kawuneeche-Dystrocryepts complex, 1 to 15 percent slopes	70	306	2,430	2,806	1.1
21	Legault very gravelly sandy loam, 15 to 45 percent slopes	---	---	1,947	1,947	0.7
22	Lumpyridge gravelly coarse sandy loam, 1 to 6 percent slopes	---	---	116	116	*
23	Lumpyridge-Rofork complex, 3 to 15 percent slopes	---	---	696	696	0.3
24	Mummy extremely cobbly sandy loam, 20 to 50 percent slopes	80	1,168	2,146	3,394	1.3
25	Mummy gravelly sandy loam, 10 to 35 percent slopes	91	76	3,870	4,037	1.5
26	Nanita extremely gravelly loamy coarse sand, 30 to 60 percent slopes	1,089	1,239	1,668	3,996	1.5
27	Nanita very gravelly sandy loam, 1 to 15 percent slopes	859	---	1,126	1,985	0.7
28	Nanita very gravelly sandy loam, 10 to 60 percent slopes	512	209	2,496	3,217	1.2
29	Nanita-Rock outcrop complex, 10 to 40 percent slopes	345	---	2,371	2,716	1.0
30	Onahu-Terric Cryofibrists-Trailridge complex, 2 to 35 percent slopes	688	1,196	4,209	6,093	2.3
31	Peeler loam, 5 to 40 percent slopes	---	715	---	715	0.3

See footnote at end of table.

Table 4.--Acreage and proportionate extent of the soils--Continued

Map symbol	Soil name	Boulder County	Grand County	Larimer County	Total	
					Area	Extent
		Acres	Acres	Acres	Acres	Pct.
32	Rock outcrop-Cathedral complex, 20 to 100 percent slopes	---	---	2,030	2,030	0.8
33	Rock outcrop-Rubble land complex, 30 to 200 percent slopes	6,096	20,127	20,957	47,180	17.7
34	Rock outcrop-Rubble land-Enentah complex, 40 to 200 percent slopes	281	184	926	1,391	0.5
35	Rofork-Chasmfalls complex, 5 to 35 percent slopes	22	---	3,338	3,360	1.3
36	Rofork-Isolation complex, 5 to 35 percent slopes	---	---	501	501	0.2
37	Rubble land, 20 to 65 percent slopes	---	---	20	20	*
38	Terric Cryofibrists, 0 to 2 percent slopes	---	44	83	127	*
39	Tileston very cobbly sandy loam, 10 to 40 percent slopes	4,451	466	1,669	6,586	2.5
40	Tonahutu very gravelly sandy loam, 15 to 30 percent slopes	---	5,286	2,106	7,392	2.8
41	Tonahutu very gravelly sandy loam, 30 to 50 percent slopes	221	---	704	925	0.3
42	Trailridge-Archrock complex, 10 to 40 percent slopes	868	3,639	8,549	13,056	4.9
43	Trailridge-Mummy complex, 20 to 60 percent slopes	1,578	6,406	13,807	21,791	8.2
44	Venable loam, 0 to 1 percent slopes	151	167	315	633	0.2
45	Ypsilon gravelly coarse sandy loam, 20 to 50 percent slopes	---	1,273	7,860	9,133	3.4
46	Water	198	243	580	1,021	0.4
	Total	25,600	98,100	142,500	266,200	100.0

* Less than 0.1 percent.

Table 5.--Nonirrigated land capabilities by map unit component

Map symbol and soil name	Comp. pct.	Land capability Nonirrigated
1:		
Archrock----------	50	7e
Fallriver---------	35	7e
2:		
Archrock----------	35	7e
Onahu-------------	25	7e
Rock outcrop------	20	8s
3:		
Bullwark----------	50	7e
Catamount---------	40	7s
4:		
Catamount---------	90	7s
5:		
Catamount---------	45	7s
Bullwark----------	30	7e
Rock outcrop------	15	---
6:		
Enentah-----------	85	7e
7:		
Enentah-----------	70	7e
Rubble land-------	15	8
8:		
Fallriver---------	90	7e
9:		
Fallriver, warm---	90	7e
10:		
Fallriver---------	50	7e
Hiamovi-----------	30	7e
11:		
Fallriver---------	60	7e
Rock outcrop------	25	---
12:		
Galuche-----------	55	8
Rock outcrop------	30	8s
13:		
Granile-----------	85	7e

Table 5.--Nonirrigated land capabilities by map unit component--Continued

Map symbol and soil name	Comp. pct.	Land capability Nonirrigated
14:		
Hiamovi-----------	55	7e
Rock outcrop------	30	---
15:		
Hiamovi-----------	50	7e
Rock outcrop------	30	---
16:		
Isolation---------	90	7e
17:		
Kawuneeche--------	90	6w
18:		
Kawuneeche--------	90	6w
19:		
Kawuneeche, low precipitation------	90	6w
20:		
Kawuneeche--------	50	6w
Dystrocryepts-----	40	6e
21:		
Legault-----------	90	7e
22:		
Lumpyridge--------	90	4e
23:		
Lumpyridge--------	60	6e
Rofork------------	25	7e
24:		
Mummy-------------	85	7e
25:		
Mummy-------------	85	7e
26:		
Nanita------------	85	7e
27:		
Nanita------------	100	7s
28:		
Nanita------------	90	7s
29:		
Nanita------------	75	7e
Rock outcrop------	15	---

Table 5.--Nonirrigated land capabilities by map unit component--Continued

Map symbol and soil name	Comp. pct.	Land capability Nonirrigated
30:		
Onahu-------------	35	7e
Terric Cryofibrist	25	6w
Trailridge--------	20	7e
31:		
Peeler------------	90	7e
32:		
Rock outcrop------	45	8s
Cathedral---------	40	7e
33:		
Rock outcrop------	40	8s
Rubble land-------	30	8s
34:		
Rock outcrop------	30	8s
Rubble land-------	30	8s
Enentah-----------	25	7e
35:		
Rofork------------	60	7e
Chasmfalls--------	30	6e
36:		
Rofork------------	60	7e
Isolation---------	30	7e
37:		
Rubble land-------	95	8s
38:		
Terric Cryofibrist	90	6w
39:		
Tileston----------	85	7e
40:		
Tonahutu----------	85	7e
41:		
Tonahutu----------	90	7e
42:		
Trailridge--------	40	7e
Archrock----------	35	7e
43:		
Trailridge--------	45	7e

Table 5.--Nonirrigated land capabilities by map unit component--Continued

Map symbol and soil name	Comp. pct.	Land capability: Nonirrigated
43:		
Mummy	40	7e
44:		
Venable	90	6w
45:		
Ypsilon	90	7e
46:		
Water	100	---

Table 6.--Ecological sites and characteristic native vegetation

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Range-land	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
1:								
Archrock--------	Alpine Clover/Avens (No ID)	Favorable	---	purple reedgrass		15	---	---
		Normal	---	alpine bluegrass		10		
		Unfavorable	---	alpine clover		10		
				grayleaf willow		8		
				groundsel		8		
				alpine fescue		7		
				cinquefoil		7		
				alpine sagebrush		5		
				avens		5		
				white marsh marigold		5		
Fallriver-------	Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		40	subalpine fir	---
		Normal	---	dwarf blueberry		10	Engelmann's spruce	---
		Unfavorable	---	Woods' rose		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
2:								
Archrock--------	Parry's Clover/Tufted Hairgrass (No ID)	Favorable	---	alpine bluegrass	15		---	---
		Normal	---	tufted hairgrass	15			
		Unfavorable	---	Bellardi bog sedge	10			
				rock sedge	10			
				Parry's clover	8			
				alpine clover	7			
				alpine sagebrush	5			
				cinquefoil	5			
				avens	5			
Onahu-----------	Diamondleaf Willow/Water Sedge (No ID)	Favorable	---	tufted hairgrass	15		---	---
		Normal	---	water sedge	15			
		Unfavorable	---	diamondleaf willow	10			
				purple reedgrass	10			
				American bistort	5			
				alpine bluegrass	5			
				beaked sedge	5			
				cinquefoil	5			
				rock sedge	5			
				white marsh marigold	5			
Rock outcrop----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
3:								
Bullwark--------	Lodgepole Pine/Elk Sedge (No ID)	Favorable	---	elk sedge		10	lodgepole pine	---
		Normal	---	kinnikinnick		10	Rocky Mountain Douglas-fir	---
		Unfavorable	---	bluegrass		5		
				cliffbush		5		
				common juniper		5		
				mountain goldenbanner		2		
Catamount-------	Lodgepole Pine/Kinnikinnick (No ID)	Favorable	---	kinnikinnick		10	lodgepole pine	---
		Normal	---	sedge		10	Rocky Mountain Douglas-fir	---
		Unfavorable	---	Woods' rose		5		
				bluegrass		5		
				cliffbush		5		
				currant		5		
				spike fescue		3		
				Oregongrape		2		

Table 6.--Ecological sites and characteristic native vegetation--Continued

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Range-land	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
4:								
Catamount-------	Lodgepole Pine/Kinnikinnick	Favorable	---	Ross' sedge		10	lodgepole pine	---
	(No ID)	Normal	---	kinnikinnick		10	Rocky Mountain Douglas-fir	---
		Unfavorable	---	Woods' rose		5		
				bluegrass		5		
				cliffbush		5		
				common juniper		5		
				spike fescue		3		
				Oregongrape		2		
5:								
Catamount-------	Lodgepole Pine/Kinnikinnick	Favorable	---	Ross' sedge		10	lodgepole pine	---
	(No ID)	Normal	---	kinnikinnick		10	Rocky Mountain Douglas-fir	---
		Unfavorable	---	Woods' rose		5		
				bluegrass		5		
				cliffbush		5		
				common juniper		5		
				spike fescue		3		
				mountain goldenbanner		2		
Bullwark--------	Lodgepole Pine/Kinnikinnick	Favorable	---	Ross' sedge		10	lodgepole pine	---
	(No ID)	Normal	---	kinnikinnick		10	Rocky Mountain Douglas-fir	---
		Unfavorable	---	Woods' rose		5		
				bluegrass		5		
				cliffbush		5		
				common juniper		5		
				spike fescue		3		
				mountain goldenbanner		2		
Rock outcrop----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
6:								
Enentah---------	Subalpine Fir-Engelmann's	Favorable	---	grouse whortleberry		40	subalpine fir	---
	Spruce/Grouse Whortleberry	Normal	---	dwarf blueberry		10	Engelmann's spruce	---
	(No ID)	Unfavorable	---	Ross' sedge		5	lodgepole pine	---
				bluegrass		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
7:								
Enentah---------	Subalpine Fir-Engelmann's	Favorable	---	grouse whortleberry		40	subalpine fir	---
	Spruce/Grouse Whortleberry	Normal	---	dwarf blueberry		10	Engelmann's spruce	---
	(No ID)	Unfavorable	---	Ross' sedge		5	lodgepole pine	---
				bluegrass		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
Rubble land-----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					

Table 6.--Ecological sites and characteristic native vegetation--Continued

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Range-land	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
8:								
Fallriver-------	Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		40	subalpine fir	---
		Normal	---	dwarf blueberry		10	Engelmann's spruce	---
		Unfavorable	---	Ross' sedge		5		
				bluegrass		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
9:								
Fallriver-------	Lodgepole Pine/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		40	lodgepole pine	---
		Normal	---	kinnikinnick		10	Engelmann's spruce	---
		Unfavorable	---	Ross' sedge		5	subalpine fir	---
				Woods' rose		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
10:								
Fallriver-------	Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		40	subalpine fir	---
		Normal	---	dwarf blueberry		10	Engelmann's spruce	---
		Unfavorable	---	Ross' sedge		5		
				bluegrass		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
Hiamovi---------	Lodgepole Pine/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		50	lodgepole pine	---
		Normal	---	common juniper		10	subalpine fir	---
		Unfavorable	---	Ross' sedge		5	Engelmann's spruce	---
				bluegrass		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
11:								
Fallriver-------	Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		40	subalpine fir	---
		Normal	---	dwarf blueberry		10	Engelmann's spruce	---
		Unfavorable	---	Ross' sedge		5	lodgepole pine	---
				bluegrass		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
Rock outcrop----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
12:								
Galuche---------	Ponderosa Pine-Rocky Mountain Douglas Fir/Mountain Muhly (No ID)	Favorable	---	Ross' sedge		15	ponderosa pine	---
		Normal	---	mountain muhly		15	Rocky Mountain Douglas-fir	---
		Unfavorable	---	kinnikinnick		10	lodgepole pine	---
				spike fescue		10		
				bluegrass		5		
				cliffbush		5		
				prairie Junegrass		5		
				prairie sagewort		5		
Rock outcrop----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					

Table 6.--Ecological sites and characteristic native vegetation--Continued

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Range-land	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
13:								
Granile	Lodgepole Pine-Common Juniper (No ID)	Favorable	---	bluegrass		15	lodgepole pine	---
		Normal	---	elk sedge		15	Rocky Mountain Douglas-fir	---
		Unfavorable	---	common juniper		10	Engelmann's spruce	---
				heartleaf arnica		5		
				kinnikinnick		5		
				mountain goldenbanner		5		
				wintergreen		5		
14:								
Hiamovi	Limber Pine/Common Juniper (No ID)	Favorable	---	grouse whortleberry		70	limber pine	---
		Normal	---	sedge		15	lodgepole pine	---
		Unfavorable	---	common juniper		10	Engelmann's spruce	---
				russet buffaloberry		5		
Rock outcrop	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
15:								
Hiamovi	Lodgepole Pine/Grouse Whortleberry (No ID)	Favorable	---	elk sedge		25	lodgepole pine	---
		Normal	---	grouse whortleberry		15	subalpine fir	---
		Unfavorable	---	common juniper		10	Engelmann's spruce	---
				Ross' sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
Rock outcrop	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
16:								
Isolation	Ponderosa Pine/Mountain Muhly (No ID)	Favorable	---	mountain muhly		25	ponderosa pine	---
		Normal	---	needleandthread		15		
		Unfavorable	---	Parry's oatgrass		10		
				spike fescue		10		
				Ross' sedge		5		
				antelope bitterbrush		5		
				blue grama		5		
				bluegrass		5		
				currant		5		
				prairie Junegrass		5		
17:								
Kawuneeche	Tufted Hairgrass/Sedge Sp. (No ID)	Favorable	---	tufted hairgrass	20		---	---
		Normal	---	Nebraska sedge	15			
		Unfavorable	---	bluejoint	10			
				rush	10			
				American mannagrass	5			
				alpine timothy	5			
				bluegrass	5			
				shrubby cinquefoil	5			
				water sedge	5			
				western wheatgrass	5			

Table 6.--Ecological sites and characteristic native vegetation--Continued

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Rangeland	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
18:								
Kawuneeche------	Diamondleaf Willow/Water Sedge	Favorable	---	tufted hairgrass	15		---	---
	(No ID)	Normal	---	water sedge	15			
		Unfavorable	---	American mannagrass	10			
				bluegrass	10			
				rush	10			
				cinquefoil	5			
				grayleaf willow	5			
				diamondleaf willow	5			
				white marsh marigold	5			
19:								
Kawuneeche------	Diamondleaf Willow/Water Sedge	Favorable	---	water sedge	15		---	---
	(No ID)	Normal	---	American mannagrass	10			
		Unfavorable	---	Baltic rush	10			
				bluegrass	10			
				diamondleaf willow	10			
				tufted hairgrass	10			
				mountain rush	5			
				rush	5			
				shrubby cinquefoil	5			
				slender wheatgrass	5			
20:								
Kawuneeche------	Diamondleaf Willow/Water Sedge	Favorable	---	tufted hairgrass	15		---	---
	(No ID)	Normal	---	water sedge	15			
		Unfavorable	---	American mannagrass	10			
				rush	10			
				bluegrass	5			
				cinquefoil	5			
				grayleaf willow	5			
				diamondleaf willow	5			
				white marsh marigold	5			
Dystrocryepts---	Tufted Hairgrass/Sedge Sp.	Favorable	---	tufted hairgrass	20		---	---
	(No ID)	Normal	---	Nebraska sedge	10			
		Unfavorable	---	bluegrass	10			
				rush	10			
				American mannagrass	5			
				alpine timothy	5			
				bluejoint	5			
				shrubby cinquefoil	5			
				water sedge	5			
				western wheatgrass	5			
21:								
Legault---------	Lodgepole Pine/Kinnikinnick	Favorable	---	Ross' sedge		10	lodgepole pine	---
	(No ID)	Normal	---	kinnikinnick		10	Rocky Mountain Douglas-fir	---
		Unfavorable	---	bluegrass		5		
				cliffbush		5		
				common juniper		5		
				mountain goldenbanner		5		
				spike fescue		3		
				Woods' rose		2		

Table 6.--Ecological sites and characteristic native vegetation--Continued

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Range-land	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
22:								
Lumpyridge------	Needleandthread/Mountain Muhly (No ID)	Favorable	---	mountain muhly	20		---	---
		Normal	---	needleandthread	15			
		Unfavorable	---	Parry's oatgrass	10			
				western wheatgrass	10			
				prairie Junegrass	5			
				prairie sagewort	5			
				slender wheatgrass	5			
				antelope bitterbrush	2			
				ponderosa pine	2			
23:								
Lumpyridge------	Needleandthread/Mountain Muhly (No ID)	Favorable	---	mountain muhly	20		ponderosa pine	---
		Normal	---	needleandthread	15			
		Unfavorable	---	Arizona fescue	10			
				Parry's oatgrass	10			
				antelope bitterbrush	5			
				ponderosa pine	5			
				prairie Junegrass	5			
				prairie sagewort	5			
				slender wheatgrass	5			
				western wheatgrass	5			
Rofork----------	Ponderosa Pine/Antelope Bitterbrush (No ID)	Favorable	---	mountain muhly		25	ponderosa pine	---
		Normal	---	needleandthread		15		
		Unfavorable	---	Parry’s oatgrass		10		
				prairie Junegrass		10		
				antelope bitterbrush		5		
				blue grama		5		
				bluegrass		5		
				mountain big sagebrush		5		
				mountain goldenbanner		5		
				ponderosa pine		5		
				wheatgrass		5		
24:								
Mummy-----------	Bellardi Bog Sedge/Avens/ Rock Sedge (No ID)	Favorable	---	Bellardi bog sedge	15		---	---
		Normal	---	tufted hairgrass	15			
		Unfavorable	---	alpine bluegrass	10			
				avens	10			
				rock sedge	10			
				American bistort	5			
				alpine clover	5			
				cinquefoil	5			
				purple reedgrass	5			
25:								
Mummy-----------	Bellardi Bog Sedge/Avens/ Rock Sedge (No ID)	Favorable	---	Bellardi bog sedge	15		---	---
		Normal	---	tufted hairgrass	15			
		Unfavorable	---	alpine bluegrass	10			
				avens	10			
				rock sedge	10			
				American bistort	5			
				alpine clover	5			
				cinquefoil	5			
				purple reedgrass	5			

Table 6.--Ecological sites and characteristic native vegetation--Continued

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Rangeland	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
26:								
Nanita----------	Lodgepole Pine/Elk Sedge (No ID)	Favorable	---	elk sedge		15	lodgepole pine	---
		Normal	---	common juniper		8	Rocky Mountain Douglas-fir	---
		Unfavorable	---	kinnikinnick		7	Engelmann's spruce	---
				cliffbush		5		
				heartleaf arnica		5		
				mountain goldenbanner		5		
				Woods' rose		3		
				Oregongrape		2		
27:								
Nanita----------	Lodgepole Pine/Elk Sedge (No ID)	Favorable	---	elk sedge		15	lodgepole pine	---
		Normal	---	common juniper		8	Rocky Mountain Douglas-fir	---
		Unfavorable	---	kinnikinnick		7	Engelmann's spruce	---
				cliffbush		5		
				heartleaf arnica		5		
				mountain goldenbanner		5		
				Woods' rose		3		
				Oregongrape		2		
28:								
Nanita----------	Lodgepole Pine/Elk Sedge (No ID)	Favorable	---	elk sedge		15	lodgepole pine	---
		Normal	---	common juniper		10	Rocky Mountain Douglas-fir	---
		Unfavorable	---	kinnikinnick		8	Engelmann's spruce	---
				cliffbush		5		
				heartleaf arnica		5		
				mountain goldenbanner		5		
				Woods' rose		3		
				Oregongrape		2		
29:								
Nanita----------	Lodgepole Pine/Elk Sedge (No ID)	Favorable	---	elk sedge		15	lodgepole pine	---
		Normal	---	common juniper		8	Rocky Mountain Douglas-fir	---
		Unfavorable	---	kinnikinnick		7	Engelmann's spruce	---
				cliffbush		5		
				heartleaf arnica		5		
				mountain goldenbanner		5		
				Woods' rose		3		
				Oregongrape		2		
Rock outcrop----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
30:								
Onahu-----------	Tufted Hairgrass/Marsh Marigold (No ID)	Favorable	---	tufted hairgrass	20		---	---
		Normal	---	water sedge	15			
		Unfavorable	---	groundsel	10			
				purple reedgrass	10			
				alpine bluegrass	5			
				beaked sedge	5			
				cinquefoil	5			
				diamondleaf willow	5			
				rock sedge	5			
				white marsh marigold	5			

Table 6.--Ecological sites and characteristic native vegetation--Continued

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Range- land	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
30:								
Terric Cryofibrists---	Diamondleaf Willow/Water Sedge (No ID)	Favorable	---	diamondleaf willow	20		---	---
		Normal	---	tufted hairgrass	20			
		Unfavorable	---	water sedge	15			
				grayleaf willow	10			
				beaked sedge	5			
				cinquefoil	5			
				common spikerush	5			
				rock sedge	5			
				white marsh marigold	5			
Trailridge------	Avens/Rock Sedge (No ID)	Favorable	---	alpine bluegrass	20		---	---
		Normal	---	rock sedge	15			
		Unfavorable	---	avens	10			
				Bellardi bog sedge	10			
				Montana wheatgrass	5			
				alpine clover	5			
				alpine sagebrush	5			
31:								
Peeler----------	Lodgepole Pine/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		20	Engelmann's spruce	---
		Normal	---	elk sedge		10	subalpine fir	---
		Unfavorable	---	common juniper		8	lodgepole pine	---
				russet buffaloberry		7		
				Oregongrape		5		
				Woods' rose		5		
				kinnikinnick		5		
32:								
Rock outcrop----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
Cathedral-------	Ponderosa Pine/Antelope Bitterbrush (No ID)	Favorable	---	mountain muhly		25	ponderosa pine	---
		Normal	---	needleandthread		15		
		Unfavorable	---	Parry's oatgrass		10		
				spike fescue		10		
				antelope bitterbrush		5		
				bluegrass		5		
				brome		5		
				common juniper		5		
				mountain goldenbanner		5		
				prairie sagewort		5		
				sedge		5		
33:								
Rock outcrop----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
Rubble land-----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
34:								
Rock outcrop----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					

Table 6.--Ecological sites and characteristic native vegetation--Continued

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Range- land	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
34:								
Rubble land-----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
Enentah---------	Lodgepole Pine/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		40	lodgepole pine	---
		Normal	---	Ross' sedge		10	Engelmann's spruce	---
		Unfavorable	---	Woods' rose		5	subalpine fir	---
				bluegrass		5		
				common juniper		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
35:								
Rofork----------	Ponderosa Pine/Antelope Bitterbrush (No ID)	Favorable	---	mountain muhly		25	ponderosa pine	---
		Normal	---	Parry's oatgrass		10		
		Unfavorable	---	mountain big sagebrush		10		
				needleandthread		10		
				prairie Junegrass		10		
				antelope bitterbrush		5		
				blue grama		5		
				bluegrass		5		
				mountain goldenbanner		5		
				ponderosa pine		5		
				wheatgrass		5		
Chasmfalls------	Ponderosa Pine/Antelope Bitterbrush (No ID)	Favorable	---	mountain muhly		25	ponderosa pine	---
		Normal	---	Parry’s oatgrass		10		
		Unfavorable	---	mountain big sagebrush		10		
				needleandthread		10		
				prairie Junegrass		10		
				antelope bitterbrush		5		
				blue grama		5		
				bluegrass		5		
				mountain goldenbanner		5		
				wheatgrass		5		
36:								
Rofork----------	Ponderosa Pine/Antelope Bitterbrush (No ID)	Favorable	---	mountain muhly		25	ponderosa pine	---
		Normal	---	Parry's oatgrass		10		
		Unfavorable	---	needleandthread		10		
				prairie Junegrass		10		
				antelope bitterbrush		5		
				blue grama		5		
				bluegrass		5		
				mountain big sagebrush		5		
				mountain goldenbanner		5		
				ponderosa pine		5		
				wheatgrass		5		
Isolation-------	Ponderosa Pine/Mountain Muhly (No ID)	Favorable	---	mountain muhly		25	ponderosa pine	---
		Normal	---	needleandthread		15		
		Unfavorable	---	Parry’s oatgrass		10		
				spike fescue		10		
				Ross' sedge		5		
				antelope bitterbrush		5		
				bluegrass		5		
				common juniper		5		
				currant		5		
				prairie Junegrass		5		

Table 6.--Ecological sites and characteristic native vegetation--Continued

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Range-land	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
37:								
Rubble land-----	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					
38:								
Terric Cryofibrists---	Diamondleaf Willow/Water Sedge (No ID)	Favorable	---	tufted hairgrass	20		---	---
		Normal	---	Baltic rush	15			
		Unfavorable	---	water sedge	15			
				American mannagrass	5			
				beaked sedge	5			
				diamondleaf willow	5			
				shrubby cinquefoil	5			
				water birch	5			
39:								
Tileston--------	Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		40	subalpine fir	---
		Normal	---	dwarf blueberry		10	Engelmann's spruce	---
		Unfavorable	---	Oregongrape		5	limber pine	---
				Ross' sedge		5		
				bluegrass		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
40:								
Tonahutu--------	Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		40	subalpine fir	---
		Normal	---	dwarf blueberry		10	Engelmann's spruce	---
		Unfavorable	---	Ross' sedge		5	lodgepole pine	---
				bluegrass		5		
				common juniper		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
41:								
Tonahutu--------	Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		40	subalpine fir	---
		Normal	---	dwarf blueberry		10	Engelmann's spruce	---
		Unfavorable	---	Ross' sedge		5	lodgepole pine	---
				bluegrass		5		
				common juniper		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
42:								
Trailridge------	Avens/Rock Sedge (No ID)	Favorable	---	alpine bluegrass	10		---	---
		Normal	---	alpine sagebrush	10			
		Unfavorable	---	avens	10			
				rock sedge	10			
				tufted hairgrass	10			
				American bistort	5			
				alpine clover	5			
				alpine fescue	5			

Table 6.--Ecological sites and characteristic native vegetation--Continued

Map symbol and soil name	Ecological site (Site ID)	Total production: Kind of year	Total production: Dry weight	Characteristic native vegetation	Composition: Range-land	Composition: Forest	Common trees	Site index
			Lb/acre		Pct.	Pct.		
42:								
Archrock	Alpine Clover/Avens (No ID)	Favorable	---	rock sedge	15		---	---
		Normal	---	alpine bluegrass	10			
		Unfavorable	---	alpine clover	10			
				alpine fescue	10			
				avens	10			
				tufted hairgrass	10			
				American bistort	5			
				alpine sagebrush	5			
				cinquefoil	5			
43:								
Trailridge	Avens/Rock Sedge (No ID)	Favorable	---	Bellardi bog sedge	20		---	---
		Normal	---	alpine bluegrass	15			
		Unfavorable	---	tufted hairgrass	10			
				Montana wheatgrass	5			
				Ross' avens	5			
				alpine clover	5			
				alpine sagebrush	5			
Mummy	Bellardi Bog Sedge/Avens/ Rock Sedge (No ID)	Favorable	---	Bellardi bog sedge	15		---	---
		Normal	---	tufted hairgrass	15			
		Unfavorable	---	alpine bluegrass	10			
				avens	10			
				rock sedge	10			
				American bistort	5			
				alpine clover	5			
				cinquefoil	5			
				purple reedgrass	5			
44:								
Venable	Diamondleaf Willow/Water Sedge (No ID)	Favorable	---	tufted hairgrass	15		---	---
		Normal	---	water sedge	15			
		Unfavorable	---	American mannagrass	10			
				rush	10			
				bluegrass	5			
				cinquefoil	5			
				grayleaf willow	5			
				diamondleaf willow	5			
				sedge	5			
				white marsh marigold	5			
45:								
Ypsilon	Subalpine Fir-Engelmann's Spruce/Grouse Whortleberry (No ID)	Favorable	---	grouse whortleberry		40	subalpine fir	---
		Normal	---	dwarf blueberry		10	Engelmann's spruce	---
		Unfavorable	---	Ross' sedge		5	limber pine	---
				bluegrass		5		
				elk sedge		5		
				heartleaf arnica		5		
				russet buffaloberry		5		
46:								
Water	--- (No ID)	Favorable	---				---	---
		Normal	---					
		Unfavorable	---					

Table 7.--Hydric soils

[This report lists all map unit components for the survey area. Dashes (---) in any column indicate that the data were not included in the database. Definitions of hydric criteria codes are included at the end of the report.]

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
1: Archrock-Fallriver association, 15 to 50 percent slopes	Archrock	50	Mountains	Unranked	---
	Fallriver	35	Mountain slopes	Unranked	---
2: Archrock-Onahu-Rock outcrop complex, 10 to 75 percent slopes	Archrock	35	Mountains	Unranked	---
	Onahu	25	Cirques	Unranked	---
	Rock outcrop	20	Mountains	Unranked	---
3: Bullwark-Catamount complex, 20 to 50 percent slopes	Bullwark	50	Mountain slopes	Unranked	---
	Catamount	40	Structural benches	Unranked	---
4: Catamount gravelly coarse sandy loam, 5 to 20 percent slopes	Catamount	90	Structural benches	Unranked	---
5: Catamount-Bullwark-Rock outcrop complex, 10 to 40 percent slopes	Catamount	90	Structural	Unranked	---
	Bullwark	30	Mountain slopes	Unranked	---
	Rock outcrop	15	Mountain slopes	No	---

Table 7..--Hydric soils--Continued

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
6: Enentah very stony loam, 10 to 40 percent slopes	Enentah	85	Moraines	Unranked	---
7: Enentah-Rubble land complex, 25 to 70 percent slopes	Enentah	70	Mountain slopes	Unranked	---
	Rubble land	15	Mountain slopes	Unranked	---
8: Fallriver gravelly sandy loam, 10 to 45 percent slopes	Fallriver	90	Mountain slopes	Unranked	---
9: Fallriver gravelly sandy loam, warm, 10 to 45 percent slopes	Fallriver, warm	90	Mountain slopes	Unranked	---
10: Fallriver-Hiamovi complex, 10 To 55 percent slopes	Fallriver	50	Mountain slopes	Unranked	---
	Hiamovi	30	Mountain slopes	Unranked	---
11: Fallriver-Rock outcrop complex, 30 to 70 percent slopes	Fallriver	50	Mountain slopes	Unranked	---
	Rock outcrop	25	Mountain slopes	Unranked	---
12: Galuche-Rock outcrop complex, 20 to 90 percent slopes	Galuche	55	Mountain slopes	Unranked	---
	Rock outcrop	30	Mountain slopes	Unranked	---
13: Granile very gravelly coarse sandy loam, 30 to 60 percent slopes	Granile	85	Mountain slopes	Unranked	---

Table 7..--Hydric soils--Continued

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
14: Hiamovi-Rock outcrop complex, 5 to 40 percent slopes---------	Hiamovi	55	Mountain slopes	Unranked	---
	Rock outcrop	30	Mountain slopes	Unranked	---
15: Hiamovi-Rock outcrop complex, 15 to 80 percent slopes--------	Hiamovi	50	Mountain slopes	Unranked	---
	Rock outcrop	30	Mountain slopes	Unranked	---
16: Isolation gravelly sandy loam, 5 to 35 percent slopes---------	Isolation	90	Moraines	Unranked	---
17: Kawuneeche loam, 0 to 1 percent slopes------------------------	Kawuneeche	90	Flood plains	Yes	2B3
18: Kawuneeche mucky peat, 0 to 4 percent slopes-----------------	Kawuneeche	90	Flood plains	Unranked	---
19: Kawuneeche mucky peat, low precipitation, 0 to 1 percent slopes------------------------	Kawuneeche, low precipitation	90	Flood plains	Yes	2B3, 4
20: Kawuneeche-Dystrocryepts complex, 1 to 15 percent slopes------------------------	Kawuneeche	50	Flood plains	Unranked	---
	Dystrocryepts	40	Drainageways	Unranked	---
21: Legault very gravelly sandy loam, 15 to 45 percent slopes--	Legault	90	Mountain slopes, structural benches	Unranked	---

Table 7.--Hydric soils--Continued

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
22: Lumpyridge gravelly coarse sandy loam, 1 to 6 percent slopes	Lumpyridge	90	Fans	Unranked	---
23: Lumpyridge-Rofork complex, 3 to 15 percent slopes	Lumpyridge	60	Fans	Unranked	---
	Rofork	25	Structural benches	Unranked	---
24: Mummy extremely cobbly sandy loam, 20 to 50 percent slopes	Mummy	85	Mountains	Unranked	---
25: Mummy gravelly sandy loam, 10 To 35 percent slopes	Mummy	85	Mountains	Unranked	---
26: Nanita extremely gravelly loamy coarse sand, 30 to 60 percent slopes	Nanita	85	Mountain slopes	Unranked	---
27: Nanita very gravelly sandy loam, 1 to 15 percent slopes	Nanita	100	Moraines	Unranked	---
28: Nanita very gravelly sandy loam, 10 to 60 percent slopes	Nanita	100	Moraines	Unranked	---
29: Nanita-Rock outcrop complex, 10 to 40 percent slopes	Nanita	100	Moraines	Unranked	---
	Rock outcrop	15	Moraines	Unranked	---
30: Onahu-Terric Cryofibrists-Trailridge complex, 2 to 35 percent slopes	Onahu	35	Mountain slopes	Unranked	---
	Terric Cryofibrists	25	Cirques	Yes	2B3, 4
	Trailridge	20	Mountains	Unranked	---

Table 7.--Hydric soils--Continued

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
31: Peeler loam, 5 to 40 percent Slopes	Peeler	90	Moraines, mountain slopes	Unranked	---
32: Rock outcrop-Cathedral complex, 20 to 100 percent slopes	Rock outcrop	45	Mountain slopes	Unranked	---
	Cathedral	40	Mountain slopes	Unranked	---
33: Rock outcrop-Rubble land complex, 30 to 200 percent slopes	Rock outcrop	30	Mountain slopes	Unranked	---
	Rubble land	30	Mountain slopes	Unranked	---
34: Rock outcrop-Rubble land-Enentah complex, 40 to 200 percent slopes	Rock outcrop	30	Mountain slopes	Unranked	---
	Rubble land	30	Mountain slopes	Unranked	---
	Enentah	25	Mountain slopes	Unranked	---
35: Rofork-Chasmfalls complex, 5 to 35 percent slopes	Rofork	60	Mountain slopes, structural benches	Unranked	---
	Chasmfalls	30	Mountain slopes	Unranked	---
36: Rofork-Isolation complex, 5 to 35 percent slopes	Rofork	60	Mountain slopes	Unranked	---
	Isolation	30	Moraines	Unranked	---
37: Rubble land, 20 to 65 percent Slopes	Rubble land	95	---	Unranked	---

Table 7..--Hydric soils--Continued

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
38: Terric Cryofibrists, 0 to 2 percent slopes	Terric Cryofibrists	90	Flood plains	Yes	2B3, 4
39: Tileston very cobbly sandy loam, 10 to 40 percent slopes	Tileston	85	Moraines	Unranked	---
40: Tonahutu very gravelly sandy loam, 15 to 30 percent slopes	Tonahutu	85	Moraines	Unranked	---
41: Tonahutu very gravelly sandy loam, 30 to 50 percent slopes	Tonahutu	90	Moraines	Unranked	---
42: Trailridge-Archrock complex, 10 to 40 percent slopes	Trailridge	40	Mountains	Unranked	---
	Archrock	35	Mountains	Unranked	---
43: Trailridge-Mummy complex, 20 to 60 percent slopes	Trailridge	45	Mountains	Unranked	---
	Mummy	40	Mountains	Unranked	---
44: Venable loam, 0 to 1 percent Slopes	Venable	90	Flood plains	Yes	2B3
45: Ypsilon gravelly coarse sandy loam, 20 to 50 percent slopes	Ypsilon	90	Mountain slopes	Unranked	---

Table 7.--Hydric soils--Continued

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
46:					
Water	Water	100	---	Unranked	---

Explanation of hydric criteria codes:

1. All Histels except for Folistels, and Histosols except for Folists.

2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:

   A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or

   B. are poorly drained or very poorly drained and have either:
      1.) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
      2.) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
      3.) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.

3. Soils that are frequently ponded for long or very long duration during the growing season.

4. Soils that are frequently flooded for long or very long duration during the growing season.

Table 8.--Hazard of erosion and suitability for roads on forestland

(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	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
1:							
Archrock	50	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
Fallriver	35	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
2:							
Archrock	35	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
Onahu	25	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Rock fragments	1.00
						Slope	1.00
						Wetness	0.50
						Sandiness	0.50
						Low strength	0.50
Rock outcrop	20	Not rated		Not rated		Not rated	
3:							
Bullwark	50	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Catamount	40	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
4:							
Catamount	90	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
5:							
Catamount	45	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00

Table 8.--Hazard of erosion and suitability for roads on forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
5:							
Bullwark	30	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
Rock outcrop	15	Not rated		Not rated		Not rated	
6:							
Enentah	85	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Rock fragments	0.50
7:							
Enentah	70	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
Rubble land	15	Not rated		Not rated		Not rated	
8:							
Fallriver	90	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
9:							
Fallriver, warm	90	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
10:							
Fallriver	50	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
Hiamovi	30	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Rock fragments	1.00
						Slope	1.00
						Sandiness	0.50
11:							
Fallriver	60	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50

Table 8.--Hazard of erosion and suitability for roads on forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
11:							
Rock outcrop--------	25	Not rated		Not rated		Not rated	
12:							
Galuche-------------	55	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
						Sandiness	0.50
Rock outcrop--------	30	Not rated		Not rated		Not rated	
13:							
Granile-------------	85	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
						Sandiness	0.50
14:							
Hiamovi-------------	55	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
						Sandiness	0.50
Rock outcrop--------	30	Not rated		Not rated		Not rated	
15:							
Hiamovi-------------	50	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Rock fragments	1.00
						Slope	1.00
						Sandiness	0.50
Rock outcrop--------	30	Not rated		Not rated		Not rated	
16:							
Isolation-----------	90	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Sandiness	0.50
17:							
Kawuneeche----------	90	Slight		Slight		Moderately suited	
						Flooding	0.50
						Low strength	0.50
						Wetness	0.50

Table 8.--Hazard of erosion and suitability for roads on forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
18:							
Kawuneeche----------	90	Slight		Slight		Poorly suited	
						Flooding	1.00
						Wetness	1.00
						Low strength	0.50
19:							
Kawuneeche, low precipitation------	90	Slight		Slight		Poorly suited	
						Flooding	1.00
						Wetness	1.00
						Low strength	0.50
20:							
Kawuneeche----------	50	Slight		Slight		Poorly suited	
						Wetness	0.96
						Flooding	0.50
						Low strength	0.50
Dystrocryepts-------	40	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
						Low strength	0.50
21:							
Legault-------------	90	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Sandiness	0.50
22:							
Lumpyridge----------	90	Slight		Slight		Well suited	
23:							
Lumpyridge----------	60	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
Rofork--------------	25	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
24:							
Mummy---------------	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Rock fragments	1.00
						Slope	1.00

Table 8.--Hazard of erosion and suitability for roads on forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
25:							
Mummy	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
26:							
Nanita	85	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
						Sandiness	0.50
27:							
Nanita	100	Slight		Slight		Moderately suited	
						Slope	0.50
						Rock fragments	0.50
						Sandiness	0.50
28:							
Nanita	90	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Rock fragments	1.00
						Slope	1.00
						Sandiness	0.50
29:							
Nanita	75	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Low strength	1.00
						Slope	1.00
						Rock fragments	0.50
Rock outcrop	15	Not rated		Not rated		Not rated	
30:							
Onahu	35	Slight		Moderate		Poorly suited	
				Slope/erodibility	0.50	Rock fragments	1.00
						Slope	1.00
						Wetness	0.50
						Sandiness	0.50
						Low strength	0.50
Terric Cryofibrists	25	Very severe		Very severe		Poorly suited	
		Organic matter content high	1.00	Organic matter content high	1.00	Low strength	1.00
						Wetness	1.00
						Ponding	0.50

Table 8.--Hazard of erosion and suitability for roads on forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
30:							
Trailridge----------	20	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
31:							
Peeler--------------	90	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
32:							
Rock outcrop--------	45	Not rated		Not rated		Not rated	
Cathedral-----------	40	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Sandiness	0.50
33:							
Rock outcrop--------	40	Not rated		Not rated		Not rated	
Rubble land---------	30	Not rated		Not rated		Not rated	
34:							
Rock outcrop--------	30	Not rated		Not rated		Not rated	
Rubble land---------	30	Not rated		Not rated		Not rated	
Enentah-------------	25	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
35:							
Rofork--------------	60	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Chasmfalls----------	30	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
36:							
Rofork--------------	60	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00

Table 8.--Hazard of erosion and suitability for roads on forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
36:							
Isolation	30	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Sandiness	0.50
37:							
Rubble land	95	Not rated		Not rated		Not rated	
38:							
Terric Cryofibrists	90	Very severe		Very severe		Poorly suited	
		Organic matter content high	1.00	Organic matter content high	1.00	Flooding	1.00
						Low strength	1.00
						Wetness	1.00
39:							
Tileston	85	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Rock fragments	0.50
						Sandiness	0.50
40:							
Tonahutu	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Sandiness	0.50
41:							
Tonahutu	90	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
						Sandiness	0.50
42:							
Trailridge	40	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
Archrock	35	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50

Table 8.--Hazard of erosion and suitability for roads on forestland--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
43:							
Trailridge	45	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
Mummy	40	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
44:							
Venable	90	Slight		Slight		Poorly suited	
						Wetness	1.00
						Flooding	0.50
						Low strength	0.50
45:							
Ypsilon	90	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Rock fragments	0.50
						Sandiness	0.50
46:							
Water	100	Not rated		Not rated		Not rated	

Table 9.--Damage by fire and seedling mortality on forestland

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Potential for damage to soil by fire: Value	Potential for seedling mortality: Rating class and limiting features	Potential for seedling mortality: Value
1:					
Archrock	50	Low		Low	
		Texture/rock fragments	0.10		
Fallriver	35	Low		Low	
2:					
Archrock	35	Low		Low	
		Texture/rock fragments	0.10		
Onahu	25	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
Rock outcrop	20	Not rated		Not rated	
3:					
Bullwark	50	High		Low	
		Texture/slope/ rock fragments	1.00		
Catamount	40	High		Low	
		Texture/slope/ surface depth	1.00		
4:					
Catamount	90	High		High	
		Texture/surface depth/rock fragments	1.00	Available water	1.00
5:					
Catamount	45	High		Low	
		Texture/surface depth/rock fragments	1.00		
Bullwark	30	High		Low	
		Texture/rock fragments	1.00		
Rock outcrop	15	Not rated		Not rated	
6:					
Enentah	85	Low		Low	
7:					
Enentah	70	High		Low	
		Texture/slope/ rock fragments	1.00		

Table 9.--Damage by fire and seedling mortality on forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
7:					
Rubble land	15	Not rated		Not rated	
8:					
Fallriver	90	Moderate		Low	
		Texture/rock fragments	0.50		
9:					
Fallriver, warm	90	Moderate		Low	
		Texture/rock fragments	0.50		
10:					
Fallriver	50	Low		Low	
Hiamovi	30	Low		Not rated	
11:					
Fallriver	60	Low		Low	
Rock outcrop	25	Not rated		Not rated	
12:					
Galuche	55	Low		Low	
Rock outcrop	30	Not rated		Not rated	
13:					
Granile	85	High		Low	
		Texture/slope/ rock fragments	1.00		
14:					
Hiamovi	55	High		Not rated	
		Texture/rock fragments	1.00	Not rated	
Rock outcrop	30	Not rated		Not rated	
15:					
Hiamovi	50	Low		Low	
Rock outcrop	30	Not rated		Not rated	
16:					
Isolation	90	Low		Low	
		Texture/rock fragments	0.10		
17:					
Kawuneeche	90	Low		Moderate	
		Texture/rock fragments	0.10	Wetness	0.50
18:					
Kawuneeche	90	Low		High	
				Wetness	1.00

Table 9.--Damage by fire and seedling mortality on forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
19:					
Kawuneeche, low precipitation	90	Low		High	
				Wetness	1.00
20:					
Kawuneeche	50	Low		High	
				Wetness	1.00
Dystrocryepts	40	Low		Low	
		Texture/rock fragments	0.10		
21:					
Legault	90	High		Low	
		Texture/slope/ surface depth/ rock fragments	1.00		
22:					
Lumpyridge	90	Moderate		High	
		Texture/rock fragments	0.50	Available water	1.00
23:					
Lumpyridge	60	Moderate		High	
		Texture/rock fragments	0.50	Available water	1.00
Rofork	25	Low		High	
				Available water	1.00
24:					
Mummy	85	Low		Low	
25:					
Mummy	85	Low		Low	
		Texture/rock fragments	0.10		
26:					
Nanita	85	High		Low	
		Texture/slope/ surface depth	1.00		
27:					
Nanita	100	Low		High	
				Available water	1.00
28:					
Nanita	90	Low		Low	
29:					
Nanita	75	Low		Low	
Rock outcrop	15	Not rated		Not rated	

Table 9.--Damage by fire and seedling mortality on forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Potential for damage to soil by fire: Value	Potential for seedling mortality: Rating class and limiting features	Potential for seedling mortality: Value
30:					
Onahu	35	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
Terric Cryofibrists	25	Low		High	
				Wetness	1.00
Trailridge	20	Moderate		Low	
		Texture/rock fragments	0.50		
31:					
Peeler	90	Moderate		Low	
		Texture/rock fragments	0.50		
32:					
Rock outcrop	45	Not rated		Not rated	
Cathedral	40	Low		Low	
33:					
Rock outcrop	40	Not rated		Not rated	
Rubble land	30	Not rated		Not rated	
34:					
Rock outcrop	30	Not rated		Not rated	
Rubble land	30	Not rated		Not rated	
Enentah	25	High		Low	
		Texture/slope/ rock fragments	1.00		
35:					
Rofork	60	Low		Low	
Chasmfalls	30	Low		High	
				Available water	1.00
36:					
Rofork	60	Low		Low	
Isolation	30	Low		High	
		Texture/rock fragments	0.10	Available water	1.00
37:					
Rubble land	95	Not rated		Not rated	
38:					
Terric Cryofibrists	90	Low		High	
				Wetness	1.00
39:					
Tileston	85	Low		Low	

Table 9.--Damage by fire and seedling mortality on forestland--Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
40:					
Tonahutu------------	85	Low		Low	
41:					
Tonahutu------------	90	High		Low	
		Texture/slope/ rock fragments	1.00		
42:					
Trailridge----------	40	Moderate		Low	
		Texture/rock fragments	0.50		
Archrock------------	35	Low		Low	
		Texture/rock fragments	0.10		
43:					
Trailridge----------	45	Low		Low	
Mummy---------------	40	Low		Low	
		Texture/rock fragments	0.10		
44:					
Venable-------------	90	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
45:					
Ypsilon-------------	90	High		Moderate	
		Texture/rock fragments	1.00	Soil reaction	0.50
46:					
Water---------------	100	Not rated		Not rated	

Table 10.--Camp and picnic areas

(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	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1:					
Archrock	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	0.19	Content of large stones	0.19
		Gravel content	0.01	Gravel content	0.01
Fallriver	35	Not rated		Not rated	
2:					
Archrock	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	0.19	Content of large stones	0.19
		Gravel content	0.01	Gravel content	0.01
Onahu	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Content of large stones	1.00
		Content of large stones	1.00	Slope	1.00
		Slope	1.00	Depth to saturated zone	0.99
Rock outcrop	20	Not rated		Not rated	
3:					
Bullwark	50	Not rated		Not rated	
Catamount	40	Not rated		Not rated	
4:					
Catamount	90	Not rated		Not rated	
5:					
Catamount	45	Not rated		Not rated	
Bullwark	30	Not rated		Not rated	
Rock outcrop	15	Not rated		Not rated	
6:					
Enentah	85	Very limited		Very limited	
		Content of large stones	1.00	Content of large stones	1.00
		Slope	1.00	Slope	1.00
7:					
Enentah	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00
Rubble land	15	Not rated		Not rated	

Table 10.--Camp and picnic areas--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
8:					
Fallriver-----------	90	Not rated		Not rated	
9:					
Fallriver, warm-----	90	Not rated		Not rated	
10:					
Fallriver-----------	50	Not rated		Not rated	
Hiamovi-------------	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Content of large stones	1.00	Content of large stones	1.00
		Gravel content	1.00	Gravel content	1.00
11:					
Fallriver-----------	60	Not rated		Not rated	
Rock outcrop--------	25	Not rated		Not rated	
12:					
Galuche-------------	55	Not rated		Not rated	
Rock outcrop--------	30	Not rated		Not rated	
13:					
Granile-------------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00
14:					
Hiamovi-------------	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Content of large stones	1.00	Content of large stones	1.00
		Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00
Rock outcrop--------	30	Not rated		Not rated	
15:					
Hiamovi-------------	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Content of large stones	1.00	Content of large stones	1.00
		Gravel content	1.00	Gravel content	1.00
Rock outcrop--------	30	Not rated		Not rated	
16:					
Isolation-----------	90	Not rated		Not rated	

Table 10.--Camp and picnic areas--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
17:					
Kawuneeche----------	90	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.90
		Flooding	1.00		
18:					
Kawuneeche----------	90	Not rated		Not rated	
19:					
Kawuneeche, low precipitation------	90	Not rated		Not rated	
20:					
Kawuneeche----------	50	Not rated		Not rated	
Dystrocryepts-------	40	Very limited		Somewhat limited	
		Flooding	1.00	Content of large stones	0.19
		Conent of large stones	0.19	Slope	0.16
		Slope	0.16		
21:					
Legault-------------	90	Not rated		Not rated	
22:					
Lumpyridge----------	90	Somewhat limited		Somewhat limited	
		Gravel content	0.22	Gravel content	0.22
23:					
Lumpyridge----------	60	Somewhat limited		Somewhat limited	
		Gravel content	0.22	Gravel content	0.22
		Slope	0.04	Slope	0.04
Rofork--------------	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	1.00	Gravel content	1.00
		Slope	0.16	Slope	0.16
24:					
Mummy---------------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
		Large stones content	0.95	Large stones content	0.95
25:					
Mummy---------------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	0.19	Content of large stones	0.19
		Gravel content	0.13	Gravel content	0.13
26:					
Nanita--------------	85	Not rated		Not rated	
27:					
Nanita--------------	100	Not rated		Not rated	

Table 10.--Camp and picnic areas--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
28:					
Nanita	90	Not rated		Not rated	
29:					
Nanita	75	Not rated		Not rated	
Rock outcrop	15	Not rated		Not rated	
30:					
Onahu	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Content of large stones	1.00
		Content of large stones	1.00	Depth to saturated zone	0.99
		Slope	0.96	Slope	0.96
Terric Cryofibrists	25	Not rated		Not rated	
Trailridge	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	1.00	Gravel content	1.00
		Content of large stones	0.19	Content of large stones	0.19
31:					
Peeler	90	Not rated		Not rated	
32:					
Rock outcrop	45	Not rated		Not rated	
Cathedral	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	0.99	Gravel content	0.99
33:					
Rock outcrop	40	Not rated		Not rated	
Rubble land	30	Not rated		Not rated	
34:					
Rock outcrop	30	Not rated		Not rated	
Rubble land	30	Not rated		Not rated	
Enentah	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00
35:					
Rofork	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00

Table 10.--Camp and picnic areas--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
35:					
Chasmfalls	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel content	0.24	Gravel content	0.24
36:					
Rofork	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00
Isolation	30	Not rated		Not rated	
37:					
Rubble land	95	Not rated		Not rated	
38:					
Terric Cryofibrists	90	Not rated		Not rated	
39:					
Tileston	85	Very limited		Very limited	
		Content of large stones	1.00	Content of large stones	1.00
		Slope	1.00	Slope	1.00
40:					
Tonahutu	85	Not rated		Not rated	
41:					
Tonahutu	90	Not rated		Not rated	
42:					
Trailridge	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Content of large stones	1.00	Content of large stones	1.00
		Gravel content	1.00	Gravel content	1.00
		Slope	1.00	Slope	1.00
Archrock	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	0.19	Content of large stones	0.19
		Gravel content	0.01	Gravel content	0.01
43:					
Trailridge	45	Not rated		Not rated	
Mummy	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	0.19	Content of large stones	0.19
		Gravel content	0.13	Gravel content	0.13
44:					
Venable	90	Not rated		Not rated	
45:					
Ypsilon	90	Not rated		Not rated	

Table 10.--Camp and picnic areas--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
46:					
Water---------------	100	Not rated		Not rated	

Table 11.--Paths and trails

(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	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1:					
Archrock------------	50	Very limited		Somewhat limited	
		Slope	1.00	Large stones content	0.19
		Large stones content	0.19		
Fallriver-----------	35	Not rated		Not rated	
2:					
Archrock------------	35	Very limited		Somewhat limited	
		Slope	1.00	Large stones content	0.19
		Large stones content	0.19		
Onahu---------------	25	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.99
		Slope	0.08		
Rock outcrop--------	20	Not rated		Not rated	
3:					
Bullwark------------	50	Not rated		Not rated	
Catamount-----------	40	Not rated		Not rated	
4:					
Catamount-----------	90	Not rated		Not rated	
5:					
Catamount-----------	45	Not rated		Not rated	
Bullwark------------	30	Not rated		Not rated	
Rock outcrop--------	15	Not rated		Not rated	
6:					
Enentah-------------	85	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00		
7:					
Enentah-------------	70	Very limited		Very limited	
		Slope	1.00	Large stones content	1.00
		Large stones content	1.00	Slope	0.86
Rubble land---------	15	Not rated		Not rated	
8:					
Fallriver-----------	90	Not rated		Not rated	
9:					
Fallriver, warm-----	90	Not rated		Not rated	

Table 11.--Paths and trails--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
10:					
Fallriver----------	50	Not rated		Not rated	
Hiamovi-------------	30	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	0.78
11:					
Fallriver----------	60	Not rated		Not rated	
Rock outcrop--------	25	Not rated		Not rated	
12:					
Galuche-------------	55	Not rated		Not rated	
Rock outcrop--------	30	Not rated		Not rated	
13:					
Granile-------------	85	Very limited		Very limited	
		Slope	1.00	Large stones content	1.00
		Large stones content	1.00	Slope	1.00
14:					
Hiamovi-------------	55	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	0.82		
Rock outcrop--------	30	Not rated		Not rated	
15:					
Hiamovi-------------	50	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
Rock outcrop--------	30	Not rated		Not rated	
16:					
Isolation----------	90	Not rated		Not rated	
17:					
Kawuneeche----------	90	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.78	Depth to saturated zone	0.78
18:					
Kawuneeche----------	90	Not rated		Not rated	
19:					
Kawuneeche, low precipitation------	90	Not rated		Not rated	
20:					
Kawuneeche----------	50	Not rated		Not rated	
Dystrocryepts-------	40	Somewhat limited		Somewhat limited	
		Large stones content	0.19	Large stones content	0.19
21:					
Legault-------------	90	Not rated		Not rated	

Table 11.--Paths and trails--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
22:					
Lumpyridge----------	90	Not limited		Not limited	
23:					
Lumpyridge----------	60	Not limited		Not limited	
Rofork--------------	25	Not limited		Not limited	
24:					
Mummy---------------	85	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	0.78
25:					
Mummy---------------	85	Somewhat limited		Somewhat limited	
		Slope	0.82	Large stones content	0.19
		Large stones content	0.19		
26:					
Nanita--------------	85	Not rated		Not rated	
27:					
Nanita--------------	100	Not rated		Not rated	
28:					
Nanita--------------	90	Not rated		Not rated	
29:					
Nanita--------------	75	Not rated		Not rated	
Rock outcrop--------	15	Not rated		Not rated	
30:					
Onahu---------------	35	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.99
Terric Cryofibrists-	25	Not rated		Not rated	
Trailridge----------	20	Very limited		Somewhat limited	
		Slope	1.00	Large stones content	0.19
		Large stones content	0.19		
31:					
Peeler--------------	90	Not rated		Not rated	
32:					
Rock outcrop--------	45	Not rated		Not rated	
Cathedral-----------	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
33:					
Rock outcrop--------	40	Not rated		Not rated	
Rubble land---------	30	Not rated		Not rated	

Table 11.--Paths and trails--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
34:					
Rock outcrop--------	30	Not rated		Not rated	
Rubble land---------	30	Not rated		Not rated	
Enentah-------------	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
35:					
Rofork--------------	60	Somewhat limited		Not limited	
		Slope	0.50		
Chasmfalls----------	30	Not limited		Not limited	
36:					
Rofork--------------	60	Somewhat limited		Not limited	
		Slope	0.50		
Isolation-----------	30	Not rated		Not rated	
37:					
Rubble land---------	95	Not rated		Not rated	
38:					
Terric Cryofibrists-	90	Not rated		Not rated	
39:					
Tileston------------	85	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00		
40:					
Tonahutu------------	85	Not rated		Not rated	
41:					
Tonahutu------------	90	Not rated		Not rated	
42:					
Trailridge----------	40	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00		
Archrock------------	35	Very limited		Somewhat limited	
		Slope	1.00	Large stones content	0.19
		Large stones content	0.19		
43:					
Trailridge----------	45	Not rated		Not rated	
Mummy---------------	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.19	Large stones content	0.19
44:					
Venable-------------	90	Not rated		Not rated	
45:					
Ypsilon-------------	90	Not rated		Not rated	

Table 11.--Paths and trails--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
46:					
Water----------------	100	Not rated		Not rated	

Table 12.--Dwellings and small commercial buildings

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
1:							
Archrock-----------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.84		
Fallriver----------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.85	Content of large stones	0.85	Content of large stones	0.85
2:							
Archrock-----------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.84		
Onahu--------------	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to saturated zone	1.00
Rock outcrop--------	20	Not rated		Not rated		Not rated	
3:							
Bullwark-----------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.29	Depth to hard bedrock	1.00	Depth to hard bedrock	0.29
		Content of large stones	0.01	Depth to soft bedrock	0.95	Content of large stones	0.01
				Content of large stones	0.01		

Table 12.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
3:							
Catamount-----------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
4:							
Catamount-----------	90	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Slope	0.63	Slope	1.00
5:							
Catamount-----------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Depth to soft bedrock	1.00
Bullwark------------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.29	Slope	1.00	Depth to hard bedrock	0.29
		Content of large stones	0.01	Depth to soft bedrock	0.95	Content of large stones	0.01
				Content of large stones	0.01		
Rock outcrop--------	15	Not rated		Not rated		Not rated	
6:							
Enentah-------------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
7:							
Enentah-------------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00

Table 12.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
7:							
Rubble land	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
8:							
Fallriver	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.85	Content of large stones	0.85	Content of large stones	0.85
9:							
Fallriver, warm	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.85	Content of large stones	0.85	Content of large stones	0.85
10:							
Fallriver	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.85	Content of large stones	0.85	Content of large stones	0.85
Hiamovi	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
11:							
Fallriver	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.85	Content of large stones	0.85	Content of large stones	0.85
Rock outcrop	25	Not rated		Not rated		Not rated	
12:							
Galuche	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00

Table 12.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
12:							
Rock outcrop--------	30	Not rated		Not rated		Not rated	
13:							
Granile-------------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
14:							
Hiamovi-------------	55	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
15:							
Hiamovi-------------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
16:							
Isolation-----------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.63	Content of large stones	0.63	Content of large stones	0.63
17:							
Kawuneeche----------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
18:							
Kawuneeche----------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 12.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
19:							
Kawuneeche, low precipitation	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
20:							
Kawuneeche	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Dystrocryepts	40	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Slope	0.16	Depth to saturated zone	0.95	Slope	1.00
				Slope	0.16		
21:							
Legault	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
22:							
Lumpyridge	90	Not limited		Not limited		Not limited	
23:							
Lumpyridge	60	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.22	Slope	0.04	Slope	1.00
		Slope	0.04			Shrink-swell	0.22
Rofork	25	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
24:							
Mummy	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00

Table 12.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
25:							
Mummy	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
26:							
Nanita	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.15	Content of large stones	0.15	Content of large stones	0.15
27:							
Nanita	100	Very limited		Very limited		Very limited	
		Content of large stones	1.00	Content of large stones	1.00	Slope	1.00
		Slope	0.01	Slope	0.01	Content of large stones	
28:							
Nanita	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.08	Content of large stones	0.08	Content of large stones	0.08
29:							
Nanita	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
Rock outcrop	15	Not rated		Not rated		Not rated	
30:							
Onahu	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.96	Slope	0.96	Slope	1.00
Terric Cryofibrists	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.22			Shrink-swell	0.22

Table 12.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
30:							
Trailridge----------	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
31:							
Peeler--------------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.22	Shrink-swell	0.22	Shrink-swell	0.22
32:							
Rock outcrop--------	45	Not rated		Not rated		Not rated	
Cathedral-----------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
33:							
Rock outcrop--------	40	Not rated		Not rated		Not rated	
Rubble land---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
34:							
Rock outcrop--------	30	Not rated		Not rated		Not rated	
Rubble land---------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
Enentah-------------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00

Table 12.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
35:							
Rofork	60	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Slope	1.00
Chasmfalls	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.68		
36:							
Rofork	60	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Slope	1.00
Isolation	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.67	Content of large stones	0.67	Content of large stones	0.67
37:							
Rubble land	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
38:							
Terric Cryofibrists	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.22			Shrink-swell	0.22
39:							
Tileston	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00

Table 12.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
40:							
Tonahutu	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
41:							
Tonahutu	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
42:							
Trailridge	40	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Depth to soft bedrock	1.00
Archrock	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.84		
43:							
Trailridge	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
Mummy	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
44:							
Venable	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.22			Shrink-swell	0.22
45:							
Ypsilon	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00

Table 12.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
46:							
Water	100	Not rated		Not rated		Not rated	

Table 13.--Roads and streets, shallow excavations, and lawns and landscaping

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1:							
Archrock	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	1.00	Droughty	0.98
				Depth to soft bedrock	0.84	Depth to bedrock	0.84
						Content of large stones	0.68
						Gravel content	0.01
Fallriver	35	Very limited		Very limited		Not rated	
		Slope	1.00	Slope	1.00		
		Content of large stones	0.85	Cutbanks cave	1.00		
		Frost action	0.50	Content of large stones	0.85		
2:							
Archrock	35	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Droughty	0.98
				Depth to soft bedrock	0.84	Depth to bedrock	0.84
						Content of large stones	0.68
						Gravel content	0.01
Onahu	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Slope	1.00
		Depth to saturated zone	0.99	Cutbanks cave	1.00	Depth to saturated zone	0.99
		Frost action	0.50	Slope	1.00	Droughty	0.09
						Content of large stones	0.08
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 13.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
3:							
Bullwark-----------	50	Very limited		Very limited		Not rated	
		Slope	1.00	Depth to hard bedrock	1.00		
		Frost action	0.50	Slope	1.00		
		Depth to hard bedrock	0.29	Depth to soft bedrock	0.95		
		Content of large stones	0.01	Cutbanks cave	0.10		
				Content of large stones	0.01		
Catamount----------	40	Very limited		Very limited		Not rated	
		Slope	1.00	Depth to soft bedrock	1.00		
		Depth to soft bedrock	1.00	Slope	1.00		
		Frost action	0.50	Cutbanks cave	0.10		
4:							
Catamount----------	90	Somewhat limited		Very limited		Not rated	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00		
		Slope	0.63	Slope	0.63		
		Frost action	0.50	Cutbanks cave	0.10		
5:							
Catamount----------	45	Very limited		Very limited		Not rated	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00		
		Slope	1.00	Slope	1.00		
		Frost action	0.50	Cutbanks cave	0.10		
Bullwark-----------	30	Very limited		Very limited		Not rated	
		Slope	1.00	Depth to hard bedrock	1.00		
		Frost action	0.50	Slope	1.00		
		Depth to hard bedrock	0.29	Depth to soft bedrock	0.95		
		Content of large stones	0.01	Cutbanks cave	0.10		
				Content of large stones	0.01		
Rock outcrop--------	15	Not rated		Not rated		Not rated	

Table 13.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
6:							
Enentah	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Content of large stones	1.00
		Content of large stones	1.00	Content of large stones	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.99
7:							
Enentah	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.99
Rubble land	15	Not rated		Not rated		Not rated	
8:							
Fallriver	90	Very limited		Very limited		Not rated	
		Slope	1.00	Cutbanks cave	1.00		
		Content of large stones	0.85	Slope	1.00		
		Frost action	0.50	Content of large stones	0.85		
9:							
Fallriver, warm	90	Very limited		Very limited		Not rated	
		Slope	1.00	Cutbanks cave	1.00		
		Content of large stones	0.85	Slope	1.00		
		Frost action	0.50	Content of large stones	0.85		
10:							
Fallriver	50	Very limited		Very limited		Not rated	
		Slope	1.00	Cutbanks cave	1.00		
		Content of large stones	0.85	Slope	1.00		
		Frost action	0.50	Content of large stones	0.85		
Hiamovi	30	Very limited		Very limited		Not rated	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00		
		Slope	1.00	Slope	1.00		
		Frost action	0.50	Cutbanks cave	0.10		

Table 13.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
11:							
Fallriver	60	Very limited		Very limited		Not rated	
		Slope	1.00	Slope	1.00		
		Content of large stones	0.85	Cutbanks cave	1.00		
		Frost action	0.50	Content of large stones	0.85		
Rock outcrop	25	Not rated		Not rated		Not rated	
12:							
Galuche	55	Very limited		Very limited		Not rated	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00		
		Slope	1.00	Slope	1.00		
		Frost action	0.50	Cutbanks cave	0.10		
Rock outcrop	30	Not rated		Not rated		Not rated	
13:							
Granile	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	1.00	Content of large stones	0.46
						Droughty	0.05
14:							
Hiamovi	55	Very limited		Very limited		Not rated	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00		
		Slope	1.00	Slope	1.00		
		Frost action	0.50	Cutbanks cave	0.10		
Rock outcrop	30	Not rated		Not rated		Not rated	
15:							
Hiamovi	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10	Gravel content	1.00
						Content of large stones	0.79

Table 13.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
15:							
Rock outcrop--------	30	Not rated		Not rated		Not rated	
16:							
Isolation-----------	90	Very limited		Very limited		Not rated	
		Slope	1.00	Cutbanks cave	1.00		
		Content of large stones	0.63	Slope	1.00		
		Frost action	0.50	Content of large stones	0.63		
17:							
Kawuneeche----------	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.90
		Depth to saturated zone	0.90	Cutbanks cave	1.00	Flooding	0.60
		Frost action	0.50	Flooding	0.60	Droughty	0.48
18:							
Kawuneeche----------	90	Very limited		Very limited		Not rated	
		Flooding	1.00	Depth to saturated zone	1.00		
		Depth to saturated zone	0.99	Cutbanks cave	1.00		
		Frost action	0.50	Flooding	0.80		
19:							
Kawuneeche, low precipitation------	90	Very limited		Very limited		Not rated	
		Frost action	1.00	Depth to saturated zone	1.00		
		Flooding	1.00	Cutbanks cave	1.00		
		Depth to saturated zone	0.99	Flooding	0.80		
20:							
Kawuneeche----------	50	Very limited		Very limited		Not rated	
		Flooding	1.00	Depth to saturated zone	1.00		
		Depth to saturated zone	0.99	Cutbanks cave	1.00		
		Frost action	0.50	Flooding	0.80		

Table 13.--Dwellings and small commercial buildings--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
20:							
Dystrocryepts-------	40	Not rated		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Slope	0.16
				Depth to saturated zone	0.95	Content of large stones	0.08
				Slope	0.16		
21:							
Legault-------------	90	Very limited		Very limited		Not rated	
		Slope	1.00	Depth to soft bedrock	1.00		
		Depth to soft bedrock	1.00	Slope	1.00		
				Cutbanks cave	0.10		
22:							
Lumpyridge----------	90	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Cutbanks cave	1.00	Gravel content	0.22
						Droughty	0.01
						Content of large stones	0.01
23:							
Lumpyridge----------	60	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Cutbanks cave	1.00	Gravel content	0.22
		Shrink-swell	0.22	Slope	0.04	Slope	0.04
		Slope	0.04			Droughty	0.01
						Content of large stones	0.01
Rofork--------------	25	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Frost action	0.50	Slope	0.16	Gravel content	1.00
		Slope	0.16	Cutbanks cave	0.10	Slope	0.16
						Content of large stones	0.01
24:							
Mummy---------------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	1.00

Table 13.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
25:							
Mummy	85	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Droughty	0.26
						Gravel content	0.13
						Content of large stones	0.08
26:							
Nanita	85	Very limited		Very limited		Not rated	
		Slope	1.00	Slope	1.00		
		Content of large stones	0.15	Cutbanks cave	1.00		
				Content of large stones	0.15		
27:							
Nanita	100	Very limited		Very limited		Not rated	
		Content of large stones	1.00	Cutbanks cave	1.00		
		Slope	0.01	Content of large stones	1.00		
				Slope	0.01		
28:							
Nanita	90	Very limited		Very limited		Not rated	
		Slope	1.00	Cutbanks cave	1.00		
		Content of large stones	0.08	Slope	1.00		
				Content of large stones	0.08		
29:							
Nanita	75	Very limited		Very limited		Not rated	
		Slope	1.00	Cutbanks cave	1.00		
		Content of large stones	1.00	Slope	1.00		
				Content of large stones	1.00		
Rock outcrop	15	Not rated		Not rated		Not rated	

Table 13.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
30:							
Onahu----------------	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	0.99	Depth to saturated zone	1.00	Depth to saturated zone	0.99
		Slope	0.96	Cutbanks cave	1.00	Slope	0.96
		Frost action	0.50	Slope	0.96	Droughty	0.09
						Content of large stones	0.08
Terric Cryofibrists-	25	Not rated		Very limited		Not rated	
				Depth to saturated zone	1.00		
				Cutbanks cave	1.00		
				Ponding	1.00		
				Content of organic matter	1.00		
Trailridge----------	20	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	1.00
						Gravel content	1.00
						Content of large stones	0.79
31:							
Peeler--------------	90	Very limited		Very limited		Not rated	
		Slope	1.00	Cutbanks cave	1.00		
		Frost action	0.50	Slope	1.00		
		Shrink-swell	0.22				
32:							
Rock outcrop--------	45	Not rated		Not rated		Not rated	
Cathedral-----------	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	1.00
						Gravel content	0.99
						Content of large stones	0.54

Table 13.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
33:							
Rock outcrop	40	Not rated		Not rated		Not rated	
Rubble land	30	Not rated		Not rated		Not rated	
34:							
Rock outcrop	30	Not rated		Not rated		Not rated	
Rubble land	30	Not rated		Not rated		Not rated	
Enentah	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.99
35:							
Rofork	60	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	1.00
						Content of large stones	0.01
Chasmfalls	30	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Droughty	0.91
				Depth to soft bedrock	0.68	Depth to bedrock	0.68
						Gravel content	0.24
36:							
Rofork	60	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	1.00
						Content of large stones	0.01

Table 13.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
36:							
Isolation-----------	30	Very limited		Very limited		Not rated	
		Slope	1.00	Cutbanks cave	1.00		
		Content of large stones	0.67	Slope	1.00		
		Frost action	0.50	Content of large stones	0.67		
37:							
Rubble land---------	95	Not rated		Not rated		Not rated	
38:							
Terric Cryofibrists-	90	Not rated		Very limited		Not rated	
				Depth to saturated zone	1.00		
				Cutbanks cave	1.00		
				Organic matter content	1.00		
				Flooding	0.80		
39:							
Tileston------------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Droughty	0.85
		Frost action	0.50	Cutbanks cave	0.10	Content of large stones	0.08
40:							
Tonahutu------------	85	Very limited		Very limited		Not rated	
		Slope	1.00	Slope	1.00		
		Frost action	0.50	Cutbanks cave	1.00		
41:							
Tonahutu------------	90	Very limited		Very limited		Not rated	
		Slope	1.00	Slope	1.00		
		Frost action	0.50	Cutbanks cave	1.00		

Table 13.--Dwellings and small commercial buildings--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
42:							
Trailridge----------	40	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	1.00
						Content of large stones	0.79
Archrock------------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Droughty	0.98
				Depth to soft bedrock	0.84	Depth to bedrock	0.84
						Content of large stones	0.68
						Gravel content	0.01
43:							
Trailridge----------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00			Slope	1.00
				Slope	1.00	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10	Gravel content	1.00
						Content of large stones	0.79
Mummy---------------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	1.00	Droughty	0.26
						Gravel content	0.13
						Content of large stones	0.08
44:							
Venable-------------	90	Very limited		Very limited		Not rated	
		Frost action	1.00	Depth to saturated zone	1.00		
		Flooding	1.00				
		Depth to saturated zone	0.99	Cutbanks cave	1.00		
				Flooding	0.60		
		Shrink-swell	0.22				

Table 13.--Dwellings and small commercial buildings--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
45:							
Ypsilon-------------	90	Very limited		Very limited		Not rated	
		Slope	1.00	Slope	1.00		
		Content of large stones	1.00	Cutbanks cave	1.00		
		Frost action	0.50	Content of large stones	1.00		
46:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 14.--Sewage disposal

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Septic tank absorption fields: Value	Sewage lagoons: Rating class and limiting features	Sewage lagoons: Value
1:					
Archrock	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
				Large stones content	0.02
Fallriver	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Large stones content	0.85	Large stones content	0.99
2:					
Archrock	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
				Large stones content	0.02
Onahu	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Slope	1.00	Depth to saturated zone	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
Rock outcrop	20	Not rated		Not rated	
3:					
Bullwark	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Slope	1.00
		Large stones content	0.01	Seepage	1.00
				Large stones content	0.09
Catamount	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00

Table 14.--Sewage disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4:					
Catamount-----------	90	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
5:					
Catamount-----------	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
Bullwark------------	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Slope	1.00
		Large stones content	0.01	Seepage	1.00
				Large stones content	0.09
Rock outcrop--------	15	Not rated		Not rated	
6:					
Enentah-------------	85	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Large stones content	1.00	Large stones content	1.00
7:					
Enentah-------------	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Large stones content	1.00	Large stones content	1.00
Rubble land---------	15	Not rated		Very limited	
				Slope	1.00
				Large stones content	1.00
				Seepage	1.00
8:					
Fallriver-----------	90	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Large stones content	0.85	Large stones content	0.99
9:					
Fallriver, warm-----	90	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Large stones content	0.85	Large stones content	0.99

Table 14.--Sewage disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Septic tank absorption fields: Value	Sewage lagoons: Rating class and limiting features	Sewage lagoons: Value
10:					
Fallriver----------	50	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Large stones content	0.85	Large stones content	0.99
Hiamovi------------	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
11:					
Fallriver----------	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Large stones content	0.85	Large stones content	0.99
Rock outcrop--------	25	Not rated		Not rated	
12:					
Galuche------------	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
Rock outcrop--------	30	Not rated		Not rated	
13:					
Granile------------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	1.00
				Large stones content	0.07
14:					
Hiamovi------------	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
Rock outcrop--------	30	Not rated		Not rated	
15:					
Hiamovi------------	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
Rock outcrop--------	30	Not rated		Not rated	

Table 14.--Sewage disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
16:					
Isolation-----------	90	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
		Large stones content	0.63	Large stones content	1.00
17:					
Kawuneeche----------	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Seepage	1.00		
18:					
Kawuneeche----------	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Depth to saturated zone	1.00
				Organic matter content	1.00
19:					
Kawuneeche, low precipitation------	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Depth to saturated zone	1.00
				Organic matter content	1.00
20:					
Kawuneeche----------	50	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Depth to saturated zone	1.00
				Organic matter content	1.00
				Slope	0.02
Dystrocryepts-------	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Slope	1.00
		Slope	0.16	Flooding	0.40
21:					
Legault-------------	90	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00		

Table 14.--Sewage disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
22:					
Lumpyridge----------	90	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Slow water movement	0.46	Slope	0.32
23:					
Lumpyridge----------	60	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Slow water movement	0.46	Slope	1.00
		Slope	0.04		
Rofork--------------	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Seepage	1.00
		Slope	0.16	Slope	1.00
24:					
Mummy---------------	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Large stones content	1.00	Large stones content	1.00
25:					
Mummy---------------	85	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
26:					
Nanita--------------	85	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
				Seepage	1.00
		Slope	1.00	Large stones content	0.84
		Seepage	1.00		
		Large stones content	0.15		
27:					
Nanita--------------	100	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Large stones content	1.00	Slope	1.00
				Large stones content	1.00
		Slope	0.01		
28:					
Nanita--------------	90	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Large stones content	0.08	Large stones content	0.49

Table 14.--Sewage disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
29:					
Nanita	75	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Large stones content	1.00	Large stones content	0.86
Rock outcrop	15	Not rated		Not rated	
30:					
Onahu	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Depth to saturated zone	1.00
		Slope	0.96	Slope	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
Terric Cryofibrists	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00
		Slow water movement	0.46	Organic matter content	1.00
				Slope	0.32
Trailridge	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
				Large stones content	0.01
31:					
Peeler	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	1.00	Seepage	0.53
32:					
Rock outcrop	45	Not rated		Not rated	
Cathedral	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
33:					
Rock outcrop	40	Not rated		Not rated	
Rubble land	30	Not rated		Very limited	
				Slope	1.00
				Large stones content	1.00
				Seepage	1.00

Table 14.--Sewage disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
34:					
Rock outcrop	30	Not rated		Not rated	
Rubble land	30	Not rated		Very limited	
				Slope	1.00
				Large stones content	1.00
				Seepage	1.00
Enentah	25	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Large stones content	1.00	Large stones content	1.00
35:					
Rofork	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
Chasmfalls	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
36:					
Rofork	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
Isolation	30	Very limited		Very limited	
		Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
		Large stones content	0.67	Large stones content	1.00
37:					
Rubble land	95	Not rated		Very limited	
				Slope	1.00
				Large stones content	1.00
				Seepage	1.00
38:					
Terric Cryofibrists	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Organic matter content	1.00

Table 14.--Sewage disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
39:					
Tileston	85	Very limited		Very limited	
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Large stones content	1.00	Large stones content	1.00
		Slow water movement	0.46		
40:					
Tonahutu	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Slow water movement	0.46	Large stones content	0.06
41:					
Tonahutu	90	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Slow water movement	0.46	Large stones content	0.06
42:					
Trailridge	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
				Large stones content	0.01
Archrock	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
				Large stones content	0.02
43:					
Trailridge	45	Very limited		Not rated	
		Depth to bedrock	1.00		
		Slope	1.00		
		Seepage	1.00		
Mummy	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
44:					
Venable	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00

Table 14.--Sewage disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
45:					
Ypsilon	90	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00
		Large stones content	1.00	Large stones content	0.03
46:					
Water	100	Not rated		Not rated	

Table 15.--Sanitary Landfills

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1:							
Archrock	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	1.00
		Seepage	1.00	Depth to bedrock	1.00	Gravel content	0.70
						Seepage	0.52
Fallriver	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Large stones content	0.61
		Large stones content	0.61			Seepage	0.52
						Gravel content	0.04
2:							
Archrock	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Gravel content	0.70
						Seepage	0.52
Onahu	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	1.00
		Seepage	1.00	Slope	1.00	Depth to bedrock	0.84
		Slope	1.00	Depth to bedrock	0.84	Seepage	0.52
						Gravel content	0.26
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 15.--Sanitary Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3:							
Bullwark-----------	50	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
		Seepage	1.00	Seepage	1.00	Gravel content	0.31
		Large stones content	0.01			Seepage	0.22
						Large stones content	0.01
Catamount----------	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
		Seepage	1.00			Gravel content	0.99
						Seepage	0.51
4:							
Catamount----------	90	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.63	Gravel content	0.99
		Slope	0.63			Slope	0.63
						Seepage	0.51
5:							
Catamount----------	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	1.00	Slope	1.00
		Slope	1.00			Gravel content	0.99
						Seepage	0.52
Bullwark-----------	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	0.31
		Large stones content	0.01			Seepage	0.22
						Large stones content	0.01
Rock outcrop--------	15	Not rated		Not rated		Not rated	

Table 15.--Sanitary Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
6:							
Enentah-------------	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Large stones	1.00
		Large stones	1.00			Seepage	0.52
7:							
Enentah-------------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Large stones	1.00
		Large stones	1.00			Seepage	0.52
Rubble land---------	15	Not rated		Not rated		Not rated	
8:							
Fallriver-----------	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Large stones content	0.61
		Large stones content	0.61			Seepage	0.52
						Gravel content	0.04
9:							
Fallriver, warm-----	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Large stones content	0.61
		Large stones content	0.61			Seepage	0.52
						Gravel content	0.04
10:							
Fallriver-----------	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Large stones content	0.61
		Large stones content	0.61			Seepage	0.52
						Gravel content	0.04
Hiamovi-------------	30	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
		Seepage	1.00			Gravel content	1.00
						Seepage	0.52

Table 15.--Sanitary Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Trench sanitary landfill: Value	Area sanitary landfill: Rating class and limiting features	Area sanitary landfill: Value	Daily cover for landfill: Rating class and limiting features	Daily cover for landfill: Value
11:							
Fallriver----------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Large stones content	0.61
		Large stones content	0.61			Seepage	0.52
						Gravel content	0.04
Rock outcrop--------	25	Not rated		Not rated		Not rated	
12:							
Galuche------------	55	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
		Seepage	1.00			Gravel content	0.97
						Seepage	0.52
Rock outcrop--------	30	Not rated		Not rated		Not rated	
13:							
Granile------------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Seepage	1.00	Gravel content	0.97
14:							
Hiamovi------------	55	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	1.00	Gravel content	1.00
		Slope	1.00			Slope	1.00
						Seepage	0.51
Rock outcrop--------	30	Not rated		Not rated		Not rated	
15:							
Hiamovi------------	50	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
		Seepage	1.00			Gravel content	1.00
						Seepage	0.51
Rock outcrop--------	30	Not rated		Not rated		Not rated	

Table 15.--Sanitary Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
16:							
Isolation-----------	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Too sandy	0.50			Too sandy	0.50
		Large stones content	0.05			Gravel content	0.08
						Large stones content	0.05
17:							
Kawuneeche----------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	1.00			Gravel content	0.87
18:							
Kawuneeche----------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	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	Seepage	1.00	Too sandy	0.50
		Too sandy	0.50			Gravel content	0.17
19:							
Kawuneeche, low precipitation------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	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	Seepage	1.00	Too sandy	0.50
		Too sandy	0.50			Gravel content	0.15
20:							
Kawuneeche----------	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	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	Seepage	1.00	Too sandy	0.50
		Too sandy	0.50			Gravel content	0.17

Table 15.--Sanitary Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
20:							
Dystrocryepts-------	40	Not rated		Very limited		Not rated	
				Depth to saturated zone	1.00		
				Seepage	1.00		
				Flooding	0.40		
				Slope	0.16		
21:							
Legault-------------	90	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
		Seepage	1.00			Seepage	1.00
		Too sandy	0.50			Gravel content	1.00
						Too sandy	0.50
22:							
Lumpyridge----------	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	0.50			Gravel content	0.85
						Too sandy	0.50
23:							
Lumpyridge----------	60	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	0.50	Slope	0.04	Gravel content	0.88
		Slope	0.04			Too sandy	0.50
						Slope	0.04
Rofork--------------	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.16	Seepage	1.00
		Too sandy	0.50			Gravel content	1.00
		Slope	0.16			Too sandy	0.50
						Slope	0.16
24:							
Mummy---------------	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Large stones	1.00
		Large stones	1.00			Seepage	0.52

Table 15.--Sanitary Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
25:							
Mummy	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Gravel content	0.89
						Seepage	0.52
26:							
Nanita	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	0.50			Gravel content	1.00
		Large stones content	0.17			Too sandy	0.50
						Large stones content	0.17
27:							
Nanita	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	0.01	Seepage	1.00
		Large stones	1.00			Large stones	1.00
		Slope	0.01			Slope	0.01
28:							
Nanita	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00	Seepage	1.00
		Slope	1.00			Slope	1.00
		Large stones content	0.13			Gravel content	1.00
						Large stones content	0.13
29:							
Nanita	75	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	1.00	Seepage	1.00
		Slope	1.00			Slope	1.00
		Large stones	1.00			Large stones	1.00
Rock outcrop	15	Not rated		Not rated		Not rated	

Table 15.--Sanitary Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
30:							
Onahu----------------	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Seepage	1.00	Slope	0.96
		Seepage	1.00	Slope	0.96	Depth to bedrock	0.84
		Slope	0.96	Depth to bedrock	0.84	Seepage	0.52
						Gravel content	0.26
Terric Cryofibrists-	25	Not rated		Very limited		Not rated	
				Depth to saturated zone	1.00		
				Seepage	1.00		
				Ponding	1.00		
Trailridge-----------	20	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
		Seepage	1.00			Gravel content	1.00
						Seepage	0.52
31:							
Peeler---------------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
32:							
Rock outcrop---------	45	Not rated		Not rated		Not rated	
Cathedral------------	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
		Seepage	1.00			Gravel content	1.00
						Seepage	0.52
33:							
Rock outcrop---------	40	Not rated		Not rated		Not rated	
Rubble land----------	30	Not rated		Not rated		Not rated	
34:							
Rock outcrop---------	30	Not rated		Not rated		Not rated	
Rubble land----------	30	Not rated		Not rated		Not rated	

Table 15.--Sanitary Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
34:							
Enentah-------------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Large stones	1.00
		Large stones	1.00			Seepage	0.52
35:							
Rofork--------------	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	1.00	Seepage	1.00
		Slope	1.00			Gravel content	1.00
		Too sandy	0.50			Slope	1.00
						Too sandy	0.50
Chasmfalls----------	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Seepage	0.52
						Gravel content	0.27
36:							
Rofork--------------	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	1.00	Seepage	1.00
		Slope	1.00			Gravel content	1.00
		Too sandy	0.50			Slope	1.00
						Too sandy	0.50
Isolation-----------	30	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Too sandy	0.50			Too sandy	0.50
		Large stones content	0.06			Gravel content	0.07
						Large stones content	0.06
37:							
Rubble land---------	95	Not rated		Not rated		Not rated	

Table 15.--Sanitary Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Trench sanitary landfill: Value	Area sanitary landfill: Rating class and limiting features	Area sanitary landfill: Value	Daily cover for landfill: Rating class and limiting features	Daily cover for landfill: Value
38:							
Terric Cryofibrists	90	Not rated		Very limited		Not rated	
				Flooding	1.00		
				Depth to saturated zone	1.00		
				Seepage	1.00		
39:							
Tileston	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Large stones	1.00
		Large stones	1.00			Seepage	0.52
40:							
Tonahutu	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00			Seepage	1.00
		Too sandy	0.50			Gravel content	0.90
						Too sandy	0.50
41:							
Tonahutu	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00			Seepage	1.00
		Too sandy	0.50			Gravel content	0.90
						Too sandy	0.50
42:							
Trailridge	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	1.00	Gravel content	1.00
		Slope	1.00			Slope	1.00
						Seepage	0.52
Archrock	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Gravel content	0.70
						Seepage	0.52

Table 15.--Sanitary Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
43:							
Trailridge	45	Very limited		Very limited		Not rated	
		Slope	1.00	Slope	1.00		
		Depth to bedrock	1.00	Depth to bedrock	1.00		
		Seepage	1.00				
Mummy	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Gravel content	0.89
						Seepage	0.52
44:							
Venable	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50	Seepage	1.00		
45:							
Ypsilon	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Large stones	1.00			Large stones	1.00
		Too sandy	0.50			Too sandy	0.50
46:							
Water	100	Not rated		Not rated		Not rated	

Table 16.--Engineering properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
1:												
Archrock--------	0-8	Gravelly loam	SM, SC-SM, GM, GC-GM	A-4	0-10	5-25	65-80	60-75	50-65	35-50	20-25	NP-5
	8-18	Very gravelly loam, very gravelly sandy loam	GM, GC-GM	A-2, A-1	0-15	5-25	35-55	30-50	25-50	20-40	20-25	NP-5
	18-25	Very gravelly coarse sandy loam, very gravelly sandy loam	GW-GM, GM, GC-GM	A-1	0-15	0-25	35-55	30-50	15-35	5-20	20-25	NP-5
	25-35	Weathered bedrock			---	---	---	---	---	---	---	---
Fallriver-------	0-2	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	2-9	Gravelly sandy loam	GM, SC-SM, GC-GM	A-2, A-1	0-15	0-25	60-80	55-75	35-50	20-30	20-25	NP-5
	9-21	Very cobbly sandy loam, very cobbly coarse sandy loam	GC-GM, GM, SM	A-1, A-2	0-25	25-60	45-85	40-80	20-50	10-30	20-25	NP-5
	21-35	Very cobbly sandy loam, very cobbly coarse sandy loam	GC-GM, GM, SM	A-1, A-2	0-25	25-70	45-85	40-80	20-50	10-30	20-25	NP-5
	35-63	Very gravelly coarse sandy loam, very gravelly loamy coarse sand	GC-GM, GW-GM, GW	A-1	0-25	15-25	35-55	30-50	15-35	0-15	20-25	NP-5
2:												
Archrock--------	0-8	Gravelly loam	SM, SC-SM, GM, GC-GM	A-4	0-10	5-25	65-80	60-75	50-65	35-50	20-25	NP-5
	8-18	Very gravelly loam	GM, GC-GM	A-2, A-1	0-15	5-25	35-55	30-50	25-50	20-40	20-25	NP-5
	18-25	Very gravelly coarse sandy loam, very gravelly sandy loam	GM, GC-GM, GW-GM	A-1	0-15	0-25	35-55	30-50	15-35	5-20	20-25	NP-5
	25-35	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In.				Pct.	Pct.					Pct.	
2:												
Onahu-----------	0-7	Loam	CL, CL-ML	A-4	0-10	0-10	85-100	80-100	70-95	50-75	25-30	5-10
	7-16	Loam, fine sandy loam, sandy loam	SC-SM, CL-ML	A-2, A-4	0-10	0-10	85-100	80-100	50-95	25-75	25-30	5-10
	16-24	Very gravelly sandy loam, very gravelly fine sandy loam	GM, GC-GM	A-2, A-1, A-4	0-20	0-20	35-55	30-50	20-50	10-40	20-25	NP-5
	24-45	Very gravelly sandy loam, very gravelly coarse sandy loam	GM, GW-GM	A-1	0-20	0-20	35-55	30-50	15-35	5-20	20-25	NP-5
	45-55	Weathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	---	---
3:												
Bullwark--------	0-2	Slightly decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	2-9	Very gravelly coarse sandy loam	GW-GM, GC-GM, GM	A-1	0-10	0-25	35-55	30-50	15-35	5-20	20-25	NP-5
	9-15	Very gravelly sandy loam, very gravelly coarse sandy loam	GW-GC, GC-GM, GC	A-1, A-2	0-10	0-25	35-55	30-50	15-35	5-20	25-30	5-10
	15-23	Very cobbly sandy loam, very cobbly sandy clay loam	GC-GM, GC	A-1, A-2, A-4	0-10	20-70	45-90	40-85	25-75	15-45	25-30	5-10
	23-32	Weathered bedrock			---	---	---	---	---	---	---	---
	32-60	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
3: Catamount-------	0-1	Slightly decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-3	Gravelly coarse sandy loam	SC-SM, SM	A-1	0	0-15	65-85	55-75	30-45	10-25	20-25	NP-5
	3-10	Very gravelly coarse sandy loam, very gravelly sandy loam	GW-GM, GC-GM, GM	A-1	0	0-15	45-65	30-50	15-30	5-15	20-25	NP-5
	10-14	Very gravelly coarse sandy loam, very gravelly sandy loam	GW-GM, GC-GM, GM	A-1	0	0-15	45-65	30-50	15-30	5-15	20-25	NP-5
	14-24	Weathered bedrock			---	---	---	---	---	---	---	---
4: Catamount-------	0-1	Slightly decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-3	Gravelly coarse sandy loam	SC-SM, SM	A-1	0	0-15	65-85	55-75	30-45	10-25	20-25	NP-5
	3-10	Very gravelly coarse sandy loam, very gravelly sandy loam	GC-GM, GM, GW-GM	A-1	0	0-15	45-65	30-50	15-30	5-15	20-25	NP-5
	10-14	Very gravelly coarse sandy loam, very gravelly sandy loam	GC-GM, GM, GW-GM	A-1	0	0-15	45-65	30-50	15-30	5-15	20-25	NP-5
	14-24	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In.				Pct.	Pct.					Pct.	
5:												
Catamount-------	0-1	Slightly decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-3	Gravelly coarse sandy loam	SC-SM, SM	A-1	0	0-15	65-85	55-75	30-45	10-25	20-25	NP-5
	3-10	Very gravelly coarse sandy loam, very gravelly sandy loam	GC-GM, GM, GW-GM	A-1	0	0-15	45-65	30-50	15-30	5-15	20-25	NP-5
	10-14	Very gravelly coarse sandy loam, very gravelly sandy loam	GC-GM, GM, GW-GM	A-1	0	0-15	45-65	30-50	15-30	5-15	20-25	NP-5
	14-24	Weathered bedrock			---	---	---	---	---	---	---	---
Bullwark--------	0-2	Slightly decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	2-9	Very gravelly coarse sandy loam	GC-GM, GM, GW-GM	A-1	0-10	0-25	35-55	30-50	15-35	5-20	20-25	NP-5
	9-15	Very gravelly sandy loam, very gravelly coarse sandy loam	GC-GM, GC, GW-GC	A-1, A-2	0-10	0-25	35-55	30-50	15-35	5-20	25-30	5-10
	15-23	Very cobbly sandy loam, very cobbly sandy clay loam	GC-GM, GC	A-2, A-4, A-1	0-10	20-70	45-90	40-85	25-75	15-45	25-30	5-10
	23-32	Weathered bedrock			---	---	---	---	---	---	---	---
	32-60	Unweathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In.				Pct.	Pct.					Pct.	
6:												
Enentah---------	0-6	Very stony loam	GC, GC-GM, SC-SM, SC	A-4, A-2	25-65	15-50	45-90	40-85	35-80	25-65	25-30	5-10
	6-20	Very cobbly loam, very cobbly sandy loam	GC-GM, GM, SC-SM, SM	A-4, A-2, A-1	0-25	25-60	45-90	40-85	25-80	15-65	20-25	NP-5
	20-34	Extremely cobbly loam, extremely cobbly sandy loam	GC-GM, GM, SC-SM, SM	A-4, A-3, A-2, A-1	0-30	30-80	20-80	15-75	10-70	5-55	20-25	NP-5
	34-56	Extremely cobbly sandy loam, extremely cobbly coarse sandy loam	GM, GP-GM, GC-GM	A-2, A-1	0-30	30-85	20-80	15-75	10-50	5-30	20-25	NP-5
	56-72	Extremely cobbly sandy loam, extremely cobbly loamy sand	GP-GM, GM, GC-GM	A-3, A-2, A-1	0-30	30-85	20-80	15-75	10-55	5-30	20-25	NP-5
7:												
Enentah---------	0-6	Very stony loam	GC, GC-GM, SC-SM, SC	A-4, A-2	25-65	15-50	45-90	40-85	35-80	25-65	25-30	5-10
	6-20	Very cobbly loam, very cobbly sandy loam	GC-GM, GM, SC-SM, SM	A-4, A-2, A-1	0-25	25-60	45-90	40-85	25-80	15-65	20-25	NP-5
	20-34	Extremely cobbly loam, extremely cobbly sandy loam	GC-GM, GM, SC-SM, SM	A-4, A-3, A-2, A-1	0-30	30-80	20-80	15-75	10-70	5-55	20-25	NP-5
	34-56	Extremely cobbly sandy loam, extremely cobbly coarse sandy loam	GM, GP-GM, GC-GM	A-2, A-1	0-30	30-85	20-80	15-75	10-50	5-30	20-25	NP-5
	56-72	Extremely cobbly sandy loam, extremely cobbly loamy sand	GP-GM, GM, GC-GM	A-3, A-2, A-1	0-30	30-85	20-80	15-75	10-55	5-30	20-25	NP-5
Rubble land-----	0-60	Stones	GW	A-1	30-80	20-65	0-10	0-5	0-5	0	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
8: Fallriver-------	0-2	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	2-9	Gravelly sandy loam	GM, SC-SM, GC-GM	A-2, A-1	0-15	0-25	60-80	55-75	35-50	20-30	20-25	NP-5
	9-21	Very cobbly sandy loam, very cobbly coarse sandy loam	GC-GM, GM, SM	A-1, A-2	0-25	25-60	45-85	40-80	20-50	10-30	20-25	NP-5
	21-35	Very cobbly sandy loam, very cobbly coarse sandy loam	GC-GM, GM, SM	A-1, A-2	0-25	25-70	45-85	40-80	20-50	10-30	20-25	NP-5
	35-63	Very gravelly coarse sandy loam, very gravelly loamy coarse sand	GC-GM, GW-GM, GW	A-1	0-25	15-25	35-55	30-50	15-35	0-15	20-25	NP-5
9: Fallriver, warm-	0-2	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	2-9	Gravelly sandy loam	GM, SC-SM, GC-GM	A-1, A-2	0-15	0-25	60-80	55-75	35-50	20-30	20-25	NP-5
	9-21	Very cobbly sandy loam, very cobbly coarse sandy loam	GC-GM, GM, SM	A-1, A-2	0-25	25-60	45-85	40-80	20-50	10-30	20-25	NP-5
	21-35	Very cobbly sandy loam, very cobbly coarse sandy loam	GC-GM, GM, SM	A-1, A-2	0-25	25-70	45-85	40-80	20-50	10-30	20-25	NP-5
	35-63	Very gravelly coarse sandy loam, very gravelly loamy coarse sand	GC-GM, GW-GM, GW	A-1	0-25	15-25	35-55	30-50	15-35	0-15	20-25	NP-5

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
10:												
Fallriver-------	0-2	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	2-9	Gravelly sandy loam	GM, SC-SM, GC-GM	A-1, A-2	0-15	0-25	60-80	55-75	35-50	20-30	20-25	NP-5
	9-21	Very cobbly sandy loam, very cobbly coarse sandy loam	GC-GM, GM, SM	A-2, A-1	0-25	25-60	45-85	40-80	20-50	10-30	20-25	NP-5
	21-35	Very cobbly sandy loam, very cobbly coarse sandy loam	GC-GM, GM, SM	A-1, A-2	0-25	25-70	45-85	40-80	20-50	10-30	20-25	NP-5
	35-63	Very gravelly coarse sandy loam, very gravelly loamy coarse sand	GC-GM, GW-GM, GW	A-1	0-25	15-25	35-55	30-50	15-35	0-15	20-25	NP-5
Hiamovi---------	0-5	Extremely gravelly sandy loam	GW-GM	A-1	0-20	0-25	15-30	10-25	5-20	5-10	20-25	NP-5
	5-13	Extremely gravelly sandy loam, extremely gravelly coarse sandy loam	GW-GM	A-1	0-20	0-25	15-30	10-25	5-20	5-10	20-25	NP-5
	13-60	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
11:												
Fallriver-------	0-2	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	2-9	Gravelly sandy loam	GM, SC-SM, GC-GM	A-1, A-2	0-15	0-25	60-80	55-75	35-50	20-30	20-25	NP-5
	9-21	Very cobbly sandy loam, very cobbly coarse sandy loam	GC-GM, GM, SM	A-1, A-2	0-25	25-60	45-85	40-80	20-50	10-30	20-25	NP-5
	21-35	Very cobbly sandy loam, very cobbly coarse sandy loam	GC-GM, GM, SM	A-1, A-2	0-25	25-70	45-85	40-80	20-50	10-30	20-25	NP-5
	35-63	Very gravelly coarse sandy loam, very gravelly loamy coarse sand	GC-GM, GW-GM, GW	A-1	0-25	15-25	35-55	30-50	15-35	0-15	20-25	NP-5
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	---	---
12:												
Galuche---------	0-1	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-3	Very gravelly sandy loam	GW-GC, GC, GC-GM, SC-SM	A-1, A-2	0-10	0-25	35-55	30-50	15-35	5-20	25-30	5-10
	3-9	Very gravelly sandy loam, very gravelly coarse sandy loam	GW-GM, GM, GC-GM	A-1	0-10	0-25	35-55	30-50	15-35	5-20	20-25	NP-5
	9-19	Very gravelly sandy loam, very gravelly coarse sandy loam	GW-GM, GC-GM, GM	A-1	0-10	0-25	35-55	30-50	15-35	5-20	20-25	NP-5
	19-60	Unweathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In.				Pct.	Pct.					Pct.	
13:												
Granile---------	0-3	Moderately decomposed plant material	PT	A-8	0-10	0-25	100	100	---	---	---	---
	3-8	Very gravelly coarse sandy loam	GC-GM, GW-GM, GM	A-1	0-25	0-25	35-55	30-50	15-35	5-15	20-25	NP-5
	8-21	Extremely gravelly coarse sandy loam, extremely gravelly sandy loam	GW-GC, GC-GM	A-1, A-2	0-25	0-25	15-30	10-25	5-20	5-10	25-30	5-10
	21-43	Very gravelly sandy clay loam, very gravelly clay loam	GC, GC-GM, GW-GC	A-4, A-6, A-2	0-25	0-25	35-55	30-50	25-50	10-40	25-35	5-15
	43-65	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly coarse sandy loam	GC, GC-GM, GW-GC	A-2, A-1	0-25	0-25	35-55	30-50	20-45	10-30	25-30	5-10
14:												
Hiamovi---------	0-5	Extremely gravelly sandy loam	GW-GM, GC-GM	A-1	0-20	0-25	15-30	10-25	5-20	5-10	20-25	NP-5
	5-13	Extremely gravelly sandy loam, extremely gravelly coarse sandy loam	GW-GM, GC-GM	A-1	0-20	0-25	15-30	10-25	5-20	5-10	20-25	NP-5
	13-60	Unweathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In.				Pct.	Pct.					Pct.	
15:												
Hiamovi---------	0-5	Extremely gravelly sandy loam	GW-GM	A-1	0-20	0-25	15-30	10-25	5-20	5-10	20-25	NP-5
	5-13	Extremely gravelly sandy loam, extremely gravelly coarse sandy loam	GW-GM	A-1	0-20	0-25	15-30	10-25	5-20	5-10	20-25	NP-5
	13-60	Unweathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	---	---
16:												
Isolation-------	0-1	Slightly decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-6	Gravelly sandy loam	GC-GM, GM, SC-SM, SM	A-1-b, A-2-4	0-10	0-15	60-80	55-75	35-50	20-30	20-25	NP-5
	6-11	Very gravelly sandy loam	GC-GM, GM, GW-GM	A-1	0-25	0-25	35-55	30-50	20-35	10-20	20-25	NP-5
	11-24	Extremely cobbly sandy loam, extremely cobbly coarse sandy loam	GC, GC-GM, GP-GC	A-1	0-30	30-70	20-80	15-75	10-55	0-30	25-30	5-10
	24-33	Extremely gravelly sandy loam, extremely cobbly sandy loam	GC, GW, GW-GC	A-1	0-30	0-35	15-50	10-45	5-30	0-20	25-30	5-10
	33-39	Extremely gravelly coarse sand, extremely gravelly loamy coarse sand	GW	A-1	0-30	0-35	15-30	10-25	5-15	0-5	0-0	NP
	39-51	Very gravelly coarse sand, very gravelly sand	GW		0-25	0-25	35-55	30-50	15-30	0-5	0-0	NP
	51-72	Loamy coarse sand, coarse sand	SM, SP-SM, SW-SM	A-1-b, A-2-4	0-10	0-10	85-100	80-100	35-70	10-25	0-0	NP

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
17:												
Kawuneeche------	0-6	Loam	CL, CL-ML	A-4	0	0	85-100	80-100	70-95	50-75	25-30	5-10
	6-12	Loam	CL, CL-ML	A-4	0	0	85-100	80-100	70-95	50-75	25-30	5-10
	12-20	Gravelly sandy loam	GC-GM, SM, SC-SM	A-1	0	0-5	65-80	60-75	35-50	20-30	20-25	NP-5
	20-35	Gravelly loamy fine sand, gravelly sandy loam	SM, SC-SM	A-1	0	0-5	60-80	55-75	30-55	10-35	0-0	NP
	35-61	Extremely gravelly coarse sand	GW	A-1	0-3	0-30	15-30	10-25	5-15	0-5	0-0	NP
18:												
Kawuneeche------	0-5	Mucky peat	PT	A-8	0	0	100	100	---	---	---	---
	5-12	Clay loam	CL-ML, CL	A-6, A-4	0	0	85-100	80-100	70-100	50-80	25-35	5-15
	12-23	Loam, silt loam	CL-ML, ML	A-4	0	0	85-100	80-100	70-100	50-90	20-25	NP-5
	23-31	Coarse sandy loam, sandy loam	SC-SM, SM	A-4, A-2, A-1	0	0	80-100	75-90	45-70	20-40	20-25	NP-5
	31-66	Very gravelly loamy sand, very gravelly sand	GM, GW, GW-GM	A-1	0-5	0-25	35-55	30-50	20-40	0-15	0-0	NP
19:												
Kawuneeche, low precipitation--	0-5	Mucky peat	PT	A-8	0	0	100	100	---	---	---	---
	5-12	Clay loam	CL, CL-ML	A-6, A-4	0	0	85-100	80-100	70-100	50-80	25-35	5-15
	12-23	Loam, silt loam	CL-ML	A-4	0	0	85-100	80-100	70-100	50-90	20-25	NP-5
	23-31	Coarse sandy loam	SC-SM, SM	A-2, A-4, A-1	0	0	80-100	75-90	45-70	20-40	20-25	NP-5
	31-66	Very gravelly loamy sand, very gravelly sand	GW, GM	A-1	0-5	0-25	35-55	30-50	20-40	0-15	0-0	NP
20:												
Kawuneeche------	0-5	Mucky peat	PT	A-8	0	0	100	100	---	---	---	---
	5-12	Clay loam	CL-ML, CL	A-6, A-4	0	0	85-100	80-100	70-100	50-80	25-35	5-15
	12-23	Loam, silt loam	CL-ML, ML	A-4	0	0	85-100	80-100	70-100	50-90	20-25	NP-5
	23-31	Coarse sandy loam, sandy loam	SC-SM, SM	A-4, A-2, A-1	0	0	80-100	75-90	45-70	20-40	20-25	NP-5
	31-66	Very gravelly loamy sand, very gravelly sand	GM, GW-GM	A-1	0-5	0-25	35-55	30-50	20-40	0-15	0-0	NP

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
20:												
Dystrocryepts---	0-8	Loam	CL, CL-ML	A-4	0-10	0-10	85-100	80-100	70-95	50-75	25-30	5-10
	8-20	Loam	CL, CL-ML	A-4	0-10	0-10	85-100	80-100	70-95	50-75	25-30	5-10
	20-30	Loam, sandy loam	SC-SM, CL-ML	A-4, A-2	0-10	0-10	85-100	80-100	50-95	25-75	25-30	5-10
	30-60	Very gravelly sandy loam, very gravelly loam	GM, GC-GM	A-1, A-2, A-4	0-20	0-20	35-55	30-50	20-50	10-40	20-25	NP-5
21:												
Legault---------	0-1	Slightly decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-3	Very gravelly sandy loam	GC-GM, GM	A-1	0-5	0-25	55-75	30-50	20-35	10-20	20-25	NP-5
	3-8	Extremely gravelly loamy sand, extremely gravelly loamy coarse sand	GW	A-1	0-5	0-25	30-45	10-25	5-20	0-5	0-0	NP
	8-12	Extremely gravelly loamy coarse sand, extremely gravelly loamy sand	GW	A-1	0-5	0-25	30-45	10-25	5-20	0-5	0-0	NP
	12-22	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In.				Pct.	Pct.					Pct.	
22:												
Lumpyridge------	0-6	Gravelly coarse sandy loam	SM, SC-SM	A-2, A-1	0-5	0-10	70-90	55-75	35-50	15-30	20-25	NP-5
	6-11	Gravelly sandy loam	SM, SC-SM	A-1, A-2	0-5	0-15	70-90	55-75	35-50	20-30	20-25	NP-5
	11-25	Gravelly sandy loam, gravelly sandy clay loam	GC-GM, SC, SC-SM	A-2, A-4, A-1	0-5	0-15	70-90	55-75	35-70	20-40	25-30	5-10
	25-39	Gravelly sandy clay loam, gravelly sandy loam	SC, SC-SM	A-2, A-4	0-5	0-15	70-90	55-75	35-70	20-40	25-30	5-10
	39-45	Very gravelly coarse sandy loam, very gravelly loamy coarse sand	GW-GM, GM, GC-GM	A-1	0-5	0-15	50-70	30-50	15-35	0-15	20-25	NP-5
	45-80	Very gravelly loamy coarse sand, very gravelly coarse sand	GW-GM, SC-SM	A-1	0-5	0-15	50-70	30-50	15-35	5-10	0-0	NP

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
23:												
Lumpyridge------	0-6	Gravelly coarse sandy loam	SM, SC-SM	A-2, A-1	0-5	0-10	70-90	55-75	35-50	15-30	20-25	NP-5
	6-11	Gravelly sandy loam	SM, SC-SM	A-1, A-2	0-5	0-10	70-90	55-75	35-50	20-30	20-25	NP-5
	11-25	Gravelly sandy loam, gravelly sandy clay loam	GC-GM, SC, SC-SM	A-1, A-2, A-4	0-5	0-10	70-90	55-75	35-70	20-40	25-30	5-10
	25-39	Gravelly sandy clay loam, gravelly sandy loam	SC, SC-SM	A-4, A-2	0-5	0-10	70-90	55-75	35-70	20-40	25-30	5-10
	39-45	Very gravelly coarse sandy loam, very gravelly loamy coarse sand	GW-GM, GM, GC-GM	A-1	0-5	0-10	50-70	30-50	15-35	0-15	20-25	NP-5
	45-80	Very gravelly loamy coarse sand, very gravelly coarse sand	GW-GM, SC-SM	A-1	0-5	0-10	50-70	30-50	15-35	5-10	0-0	NP
Rofork----------	0-5	Very gravelly sandy loam	GC, GC-GM	A-1, A-2-4	0-2	0-10	40-65	30-50	20-35	10-20	25-30	5-10
	5-10	Very gravelly sandy loam, very gravelly coarse sandy loam	GC, GC-GM	A-1, A-2-4	0-2	0-10	40-65	30-50	20-35	10-20	25-30	5-10
	10-14	Extremely gravelly loamy coarse sand, extremely gravelly coarse sandy loam	GC-GM, GW	A-1	0	0	20-35	10-25	5-15	0-10	20-25	NP-5
	14-24	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
24:												
Mummy-----------	0-5	Extremely cobbly sandy loam	SP-SC, GC, GP-GC	A-2, A-1	0-25	30-80	20-80	15-75	10-50	5-30	25-30	5-10
	5-24	Extremely cobbly sandy loam	GP-GC, SC-SM, SC	A-2, A-1	0-25	30-80	20-80	15-75	10-50	5-30	25-30	5-10
	24-72	Extremely cobbly sandy loam, extremely cobbly coarse sandy loam, very cobbly sandy loam	SP-SM, GW-GM, SM, SC-SM	A-2, A-1	0-25	30-80	20-90	15-85	5-60	5-35	20-25	NP-5
25:												
Mummy-----------	0-10	Gravelly sandy loam	GC-GM, SC-SM	A-4	0-10	0-10	60-80	55-75	50-70	35-55	25-30	5-10
	10-21	Very gravelly sandy loam, very gravelly loam	GW-GC, GC	A-4, A-2, A-1	0-10	0-25	35-55	30-50	20-50	10-40	25-30	5-10
	21-63	Very gravelly sandy loam, very gravelly loam	GW-GM, GM, GC-GM	A-4, A-2, A-1	0-25	0-25	35-55	30-50	15-50	5-40	20-25	NP-5
26:												
Nanita----------	0-1	Slightly decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-2	Extremely gravelly loamy coarse sand	GW	A-1	0-25	0-25	15-30	10-25	5-20	0-5	20-25	NP-5
	2-7	Extremely gravelly loamy sand	GW	A-1	0-25	0-35	15-30	10-25	5-20	0-5	0-0	NP
	7-18	Extremely gravelly loamy sand	GW	A-1	0-30	0-35	15-30	10-25	5-20	0-5	0-0	NP
	18-72	Extremely gravelly loamy sand	GW	A-1	0-30	0-35	15-30	10-25	5-20	0-5	20-25	NP-5

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
27:												
Nanita----------	0-1	Slightly decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-8	Very gravelly sandy loam	GM, GC-GM	A-1	0-25	0-25	35-55	30-50	20-35	10-20	20-25	NP-5
	8-18	Extremely cobbly loamy sand	GM, SM, SP-SM, GP-GM	A-1, A-2	0-30	30-85	25-85	20-80	5-50	0-30	0-0	NP
	18-28	Extremely cobbly loamy sand, extremely cobbly sandy loam	GP, SM, SP-SM, GP-GM	A-1, A-2	0-30	30-85	25-85	20-80	5-50	0-30	0-0	NP
	28-72	Extremely cobbly loamy coarse sand, extremely cobbly sand, extremely gravelly sand	SP-SM, SP, GP-GM, GP	A-1	0-30	30-85	20-80	15-75	5-50	0-10	0-0	NP
28:												
Nanita----------	0-1	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-10	Very gravelly sandy loam	GC-GM, GM, GW-GM	A-1	0-25	0-25	35-55	30-50	20-35	10-20	20-25	NP-5
	10-23	Extremely gravelly loamy sand	GW	A-1	0-25	0-35	15-30	10-25	5-20	0-5	0-0	NP
	23-41	Extremely gravelly sand, extremely gravelly sandy loam	GW	A-1	0-30	0-35	15-30	10-25	5-14	0-5	0-0	NP
	41-71	Extremely gravelly sand, extremely gravelly sandy loam	GW	A-1	0-30	0-35	15-30	10-25	5-14	0-5	0-0	NP

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In.				Pct.	Pct.					Pct.	
29:												
Nanita----------	0-4	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	4-6	Gravelly sandy loam	SC-SM, SM	A-1	0-15	0-20	60-80	55-75	30-45	15-25	20-25	NP-5
	6-15	Very gravelly loamy sand	GM, GC-GM	A-1	0-25	0-25	35-55	30-50	20-40	10-15	20-25	NP-5
	15-26	Very gravelly sand	GW, GW-GM	A-1	0-30	30-85	25-85	20-80	20-35	0-10	0-0	NP
	26-43	Extremely cobbly loamy sand, extremely cobbly loamy coarse sand	GP, SM, SP-SM, GP-GM	A-1	0-30	30-85	25-85	20-80	5-50	0-20	20-25	NP-5
	43-71	Extremely gravelly sand	GW, GP	A-1	0-30	30-85	20-80	15-75	5-15	0-5	0-0	NP
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	---	---
30:												
Onahu-----------	0-7	Loam	CL, CL-ML	A-4	0-10	0-10	85-100	80-100	70-95	50-75	25-30	5-10
	7-16	Loam, fine sandy loam, sandy loam	SC-SM, CL-ML, SC	A-4, A-2	0-10	0-10	85-100	80-100	50-95	25-75	25-30	5-10
	16-24	Very gravelly sandy loam, very gravelly fine sandy loam	GM, GC-GM	A-4, A-2, A-1	0-20	0-20	35-55	30-50	20-50	10-40	20-25	NP-5
	24-45	Very gravelly sandy loam, very gravelly coarse sandy loam	GM, GW-GM	A-1	0-20	0-20	35-55	30-50	15-35	5-20	20-25	NP-5
	45-55	Weathered bedrock			---	---	---	---	---	---	---	---
Terric Cryofibrists---	0-19	Peat	PT	A-8	0	0	---	---	---	---	---	---
	19-21	Muck	PT	A-8	0	0	---	---	---	---	---	---
	21-32	Loam	CL, CL-ML	A-4	0	0-25	85-100	80-100	70-95	50-75	25-30	5-10
	32-53	Stratified loamy sand to loam	SC, CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-25	85-100	80-100	40-95	15-75	20-30	NP-10
	53-60	Very gravelly sandy loam, very gravelly loamy sand	GC-GM, GM, GW-GM	A-1	0-10	0-25	35-55	30-50	20-40	10-20	20-25	NP-5

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In.				Pct.	Pct.					Pct.	
30:												
Trailridge------	0-6	Extremely gravelly sandy loam	GW-GM, GM, GC-GM	A-1	0-20	0-25	25-40	20-35	10-20	5-15	20-25	NP-5
	6-11	Extremely gravelly sandy loam	GW-GM, GM, GC-GM	A-1	0-20	0-25	25-40	20-30	10-20	5-15	20-25	NP-5
	11-19	Extremely gravelly coarse sandy loam, extremely gravelly sandy loam	GM, GW-GM, GC-GM	A-1	0-20	0-25	25-35	20-30	10-20	5-15	20-25	NP-5
	19-29	Weathered bedrock			---	---	---	---	---	---	---	---
31:												
Peeler----------	0-2	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	2-10	Loam	CL, CL-ML	A-4	0	0-15	100	100	85-95	60-75	25-30	5-10
	10-22	Sandy clay loam, loam	CL-ML, SC, SC-SM	A-4, A-2	0	0-15	85-100	80-100	65-90	30-55	25-30	5-10
	22-40	Sandy clay loam, clay loam	CL-ML, SC, SC-SM	A-4, A-2	0	0-15	85-100	80-100	65-100	30-80	25-30	5-10
	40-62	Gravelly sandy clay loam, gravelly sandy loam	GC-GM, GC, SC-SM, SC	A-4, A-2, A-1	0	0-15	60-80	55-75	35-70	20-40	25-30	5-10
32:												
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	---	---
Cathedral-------	0-9	Very gravelly sandy loam	GM, GW-GM	A-1	0-10	0-25	40-60	30-50	20-35	10-20	20-25	NP-5
	9-15	Extremely gravelly sandy loam, extremely gravelly coarse sandy loam	GW-GC, GC-GM	A-1, A-2	0-10	0-25	25-40	10-25	5-20	5-10	25-30	5-10
	15-60	Unweathered bedrock			---	---	---	---	---	---	---	---
33:												
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	---	---
Rubble land-----	0-60	Stones	GW	A-1	30-80	20-65	0-10	0-5	0-5	0	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In.				Pct.	Pct.					Pct.	
34:												
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	---	---
Rubble land-----	0-60	Stones	GW	A-1	30-80	20-65	0-10	0-5	0-5	0	---	---
Enentah---------	0-6	Very stony loam	GC, GC-GM, SC-SM, SC	A-4, A-2	25-65	15-50	45-90	40-85	35-80	25-65	25-30	5-10
	6-20	Very cobbly loam, very cobbly sandy loam	GC-GM, GM, SC-SM, SM	A-4, A-2, A-1	0-25	25-60	45-90	40-85	25-80	15-65	20-25	NP-5
	20-34	Extremely cobbly loam, extremely cobbly sandy loam	GC-GM, GM, SC-SM, SM	A-3, A-4, A-2, A-1	0-30	30-80	20-80	15-75	10-70	5-55	20-25	NP-5
	34-56	Extremely cobbly sandy loam, extremely cobbly coarse sandy loam	GM, GP-GM, GC-GM	A-1, A-2	0-30	30-85	20-80	15-75	10-50	5-30	20-25	NP-5
	56-72	Extremely cobbly sandy loam, extremely cobbly loamy sand	GM, GC-GM, GP-GM	A-3, A-2, A-1	0-30	30-85	20-80	15-75	10-55	5-30	20-25	NP-5
35:												
Rofork----------	0-5	Very gravelly sandy loam	GC, GC-GM	A-1, A-2-4	0-2	0-10	40-65	30-50	20-35	10-20	25-30	5-10
	5-10	Very gravelly sandy loam, very gravelly coarse sandy loam	GC, GC-GM	A-1, A-2-4	0-2	0-10	40-65	30-50	20-35	10-20	25-30	5-10
	10-14	Extremely gravelly loamy coarse sand, extremely gravelly coarse sandy loam	GW, GC-GM	A-1	0	0	20-40	10-25	5-15	0-10	20-25	NP-5
	14-24	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In.				Pct.	Pct.					Pct.	
35:												
Chasmfalls	0-4	Gravelly sandy loam	GC, GC-GM, SC, SC-SM	A-1-b, A-2-4	0-2	0-5	60-85	55-75	35-50	20-30	25-30	5-10
	4-13	Gravelly coarse sandy loam	SC, SC-SM	A-1-b, A-2-4	0-2	0-5	60-85	55-75	35-45	15-25	25-30	5-10
	13-19	Gravelly sandy loam, gravelly coarse sandy loam	GC-GM, GM, SC-SM, SM	A-1-b, A-2-4	0	0-1	60-85	55-75	35-50	20-30	20-25	NP-5
	19-28	Gravelly coarse sandy loam, gravelly sandy loam	GC-GM, GM, SC-SM, SM	A-2, A-1	0	0-1	60-85	55-75	35-50	20-30	20-25	NP-5
	28-38	Weathered bedrock			---	---	---	---	---	---	---	---
36:												
Rofork	0-5	Very gravelly sandy loam	GC, GC-GM	A-1, A-2-4	0-2	0-10	40-65	30-50	20-35	10-20	25-30	5-10
	5-10	Very gravelly sandy loam, very gravelly coarse sandy loam	GC, GC-GM	A-1, A-2-4	0-2	0-10	40-65	30-50	20-35	10-20	25-30	5-10
	10-14	Extremely gravelly loamy coarse sand, extremely gravelly coarse sandy loam	GW	A-1	0	0	20-40	10-25	5-15	0-5	20-25	NP-5
	14-24	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In.				Pct.	Pct.					Pct.	
36: Isolation-------	0-1	Slightly decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-6	Gravelly sandy loam	GC-GM, GM, SC-SM, SM	A-1-b, A-2-4	0-10	0-15	60-80	55-75	35-50	20-30	20-25	NP-5
	6-11	Very gravelly sandy loam	GC-GM, GM, GW-GM	A-1	0-25	0-25	35-55	30-50	20-35	10-20	20-25	NP-5
	11-24	Extremely cobbly sandy loam, extremely cobbly coarse sandy loam	GC, GC-GM, GP-GC	A-1	0-30	30-70	20-80	15-75	10-55	0-30	25-30	5-10
	24-33	Extremely gravelly sandy loam, extremely cobbly sandy loam	GC, GW, GW-GC	A-1	0-30	15-35	15-50	10-45	5-30	0-20	25-30	5-10
	33-39	Extremely gravelly coarse sand, extremely gravelly loamy coarse sand	GW	A-1	0-30	0-35	15-30	10-25	5-15	0-5	0-0	NP
	39-51	Very gravelly coarse sand, very gravelly sand	GW		0-25	0-25	35-55	30-50	15-30	0-5	0-0	NP
	51-72	Loamy coarse sand, coarse sand	SM, SP-SM, SW-SM	A-1-b, A-2-4	0-10	0-10	85-100	80-100	35-70	10-25	0-0	NP
37: Rubble land-----	0-60	Stones	GW	A-1	30-80	20-65	0-10	0-5	0-5	0	---	---
38: Terric Cryofibrists---	0-19	Peat	PT	A-8	0	0	---	---	---	---	---	---
	19-21	Muck	PT	A-8	0	0	---	---	---	---	---	---
	21-32	Loam, fine sandy loam	CL, CL-ML	A-4	0	0-25	85-100	80-100	70-95	50-75	25-30	5-10
	32-53	Stratified loamy sand to loam	CL-ML, ML, SC-SM, SM, SC	A-4, A-1, A-2	0	0-25	85-100	80-100	40-95	15-75	20-30	NP-10
	53-60	Very gravelly sandy loam, very gravelly loamy sand	GC-GM, GM, GW-GM	A-1	0-10	0-25	35-55	30-50	20-40	10-20	20-25	NP-5

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In.				Pct.	Pct.					Pct.	
39:												
Tileston--------	0-3	Moderately decomposed plant material	PT	A-8	0-10	0-15	100	100	---	---	---	---
	3-7	Very cobbly sandy loam	GC-GM, SC-SM, GM	A-1, A-2	0-25	25-65	45-90	40-85	25-60	15-35	20-25	NP-5
	7-13	Very gravelly sandy loam, very gravelly sandy clay loam	GC-GM, GW-GC, GC	A-1, A-2	0-25	0-25	35-55	30-50	20-45	10-30	25-30	5-10
	13-28	Extremely cobbly sandy loam, extremely cobbly sandy clay loam	GC-GM, GC, SC-SM	A-1, A-2, A-4	0-25	30-85	20-80	15-75	10-70	5-40	25-30	5-10
	28-36	Extremely cobbly sandy clay loam, extremely cobbly sandy loam	GC, GC-GM, SC-SM	A-4, A-2	0-25	30-75	20-80	15-75	10-70	5-40	25-30	5-10
	36-64	Extremely cobbly sandy loam, extremely cobbly coarse sandy loam, extremely cobbly loamy coarse sand	GP, GC-GM, GP-GM	A-2, A-1	0-30	30-85	20-80	15-75	5-50	0-30	20-25	NP-10

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In.				Pct.	Pct.					Pct.	
40:												
Tonahutu--------	0-1	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-6	Very gravelly sandy loam	GC-GM, GM	A-1	0-20	0-25	35-55	30-50	20-35	10-20	20-25	NP-5
	6-21	Very gravelly sandy loam, very gravelly sandy clay loam, very gravelly coarse sandy loam	GC-GM, GC	A-2, A-1	0-25	0-25	35-55	30-50	20-50	10-30	20-30	NP-10
	21-35	Very gravelly sandy loam, very gravelly sandy clay loam, very gravelly coarse sandy loam	GC-GM, GC	A-2, A-1	0-25	0-25	35-55	30-50	20-50	10-30	20-30	NP-10
	35-45	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly coarse sandy loam	GC-GM, GC	A-2, A-1	0-25	0-30	35-55	30-50	20-50	10-30	20-30	NP-10
	45-62	Very gravelly loamy sand, very gravelly sandy loam	GM, GC-GM	A-1	0-25	0-30	35-55	30-50	20-40	10-15	20-25	NP-5

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
41:												
Tonahutu--------	0-1	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	1-6	Very gravelly sandy loam	GC-GM, GM	A-1	0-20	0-25	35-55	30-50	20-35	10-20	20-25	NP-5
	6-21	Very gravelly sandy loam, very gravelly sandy clay loam, very gravelly coarse sandy loam	GC-GM, GC	A-1, A-2	0-25	0-25	35-55	30-50	20-50	10-30	20-30	NP-10
	21-35	Very gravelly sandy loam, very gravelly sandy clay loam, very gravelly coarse sandy loam	GC-GM, GC	A-2, A-1	0-25	0-25	35-55	30-50	20-50	10-30	20-30	NP-10
	35-45	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly coarse sandy loam	GC-GM, GC	A-2, A-1	0-25	0-30	35-55	30-50	20-50	10-30	20-30	NP-10
	45-62	Very gravelly loamy sand, very gravelly sandy loam	GM, GC-GM	A-1	0-25	0-30	35-55	30-50	20-40	10-15	20-25	NP-5
42:												
Trailridge------	0-6	Extremely gravelly sandy loam	GW-GM, GM, GC-GM	A-1	0-20	0-25	25-40	20-35	10-20	5-15	20-25	NP-5
	6-11	Extremely gravelly sandy loam	GW-GM, GM, GC-GM	A-1	0-20	0-25	25-40	20-35	10-20	5-15	20-25	NP-5
	11-19	Extremely gravelly coarse sandy loam, extremely gravelly sandy loam	GM, GW-GM, GC-GM	A-1	0-20	0-25	25-35	20-30	10-20	5-15	20-25	NP-5
	19-29	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
42:												
Archrock--------	0-8	Gravelly loam	SM, SC-SM, GM, GC-GM	A-4	0-10	5-25	65-80	60-75	50-65	35-50	20-25	NP-5
	8-18	Very gravelly loam, very gravelly sandy loam	GM, GC-GM	A-2, A-1	0-15	5-25	35-55	30-50	25-50	20-40	20-25	NP-5
	18-25	Very gravelly coarse sandy loam, very gravelly sandy loam	GM, GW-GM, GC-GM	A-1	0-15	0-25	35-55	30-50	15-35	5-20	20-25	NP-5
	25-35	Weathered bedrock			---	---	---	---	---	---	---	---
43:												
Trailridge------	0-6	Extremely gravelly sandy loam			0-20	0-25	15-30	10-25	5-20	5-10	20-25	NP-5
	6-11	Extremely gravelly sandy loam			0-20	0-25	15-30	10-25	5-20	5-10	20-25	NP-5
	11-19	Extremely gravelly coarse sandy loam, extremely gravelly sandy loam			0-20	0-25	15-30	10-25	5-20	5-10	20-25	NP-5
	19-29	Weathered bedrock			---	---	---	---	---	---	---	---
Mummy-----------	0-10	Gravelly sandy loam	GC-GM, SC-SM	A-4	0-10	0-10	60-80	55-75	50-70	35-55	25-30	5-10
	10-21	Very gravelly sandy loam, very gravelly loam	GW-GC, GC, GC-GM	A-2, A-4, A-1	0-10	0-25	35-55	30-50	20-50	10-40	25-30	5-10
	21-63	Very gravelly sandy loam, very gravelly loam, very gravelly coarse sandy loam	GW-GM, GM, GC-GM	A-2, A-1, A-4	0-25	0-25	35-55	30-50	15-50	5-40	20-25	NP-5

Table 16.--Engineering properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
44:												
Venable	0-3	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	3-9	Loam	CL, CL-ML	A-4	0	0-5	85-100	80-100	70-95	50-75	25-30	5-10
	9-14	Loam	CL, CL-ML		0-5	0-10	85-100	80-100	70-95	50-75	25-30	5-10
	14-31	Sandy clay loam, loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0-5	0-10	85-100	80-100	65-90	30-60	25-30	5-10
	31-43	Gravelly loamy coarse sand, gravelly coarse sandy loam	SC-SM, SM, SW-SM	A-1-b	0-5	0-15	60-80	55-75	25-50	10-20	20-25	NP-5
	43-63	Very cobbly loam, very cobbly silty clay loam, very cobbly clay loam	CL, GC, SC	A-2-6, A-6	0-10	20-35	45-90	40-85	40-80	25-75	30-35	10-15
45:												
Ypsilon	0-6	Moderately decomposed plant material	PT	A-8	---	---	100	100	---	---	---	---
	6-14	Gravelly coarse sandy loam	GM, SC-SM, GC-GM	A-1, A-2	0-15	0-15	60-80	55-75	35-50	20-30	20-25	NP-5
	14-19	Very cobbly coarse sandy loam, very cobbly sandy loam	GC-GM, GM, GW-GM	A-2, A-1	0-25	20-70	45-90	40-85	20-60	10-35	20-25	NP-5
	19-24	Very cobbly coarse sandy loam, very cobbly sandy loam	GC-GM, GW-GM	A-1, A-2	10-25	20-70	45-90	40-85	20-60	10-35	20-25	NP-5
	24-35	Extremely stony sandy loam, extremely stony coarse sandy loam	GM, GC-GM, GP-GM	A-2, A-1	30-75	20-70	20-80	15-75	5-50	5-30	20-25	NP-5
	35-67	Extremely cobbly loamy coarse sand, extremely cobbly loamy sand	GC-GM, GM, GW-GM	A-1	0-30	30-85	20-80	15-75	5-55	5-20	20-25	NP-5
46:												
Water	---	---	---	---	---	---	---	---	---	---	---	---

Table 17.--Physical soil properties

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Sand	Silt	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.	Pct.	Pct.	g/cc	In./hr.	In./in.	Pct.	Pct.					
1:														
Archrock------------	0-8	---	---	10-18	1.25-1.35	2-6	0.10-0.13	0.0-2.9	1.0-5.0	.15	.24	2	5	56
	8-18	---	---	10-18	1.25-1.35	2-6	0.07-0.09	0.0-1.6	0.5-2.0	.15	.37			
	18-25	---	---	5-18	1.35-1.45	2-6	0.05-0.07	0.0-1.0	0.0-2.0	.10	.24			
	25-35	---	---	---	---	0.00-0.2	---	---	---	---	---			
Fallriver-----------	0-2	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	3	86
	2-9	---	---	8-18	1.35-1.45	2-6	0.07-0.10	0.0-2.9	0.5-1.0	.15	.28			
	9-21	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-2.0	.10	.24			
	21-35	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-1.0	.10	.24			
	35-63	---	---	5-15	1.35-1.55	2-6	0.03-0.06	0.0-1.0	0.0-0.5	.10	.20			
2:														
Archrock------------	0-8	---	---	10-18	1.25-1.35	2-6	0.10-0.13	0.0-2.9	1.0-5.0	.15	.24	2	5	56
	8-18	---	---	10-18	1.25-1.35	2-6	0.07-0.09	0.0-1.6	0.5-2.0	.15	.37			
	18-25	---	---	5-18	1.35-1.45	2-6	0.05-0.07	0.0-1.0	0.0-2.0	.10	.24			
	25-35	---	---	---	---	0.00-0.2	---	---	---	---	---			
Onahu---------------	0-7	---	---	10-18	1.25-1.35	0.6-2	0.13-0.16	0.0-2.9	3.0-5.0	.20	.20	3	5	56
	7-16	---	---	10-18	1.25-1.45	2-6	0.09-0.15	0.0-2.9	1.0-5.0	.24	.24			
	16-24	---	---	8-18	1.25-1.45	2-6	0.05-0.09	0.0-1.6	0.0-1.0	.15	.32			
	24-45	---	---	5-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.0-1.0	.10	.28			
	45-55	---	---	---	---	0.00-0.2	---	---	---	---	---			
Rock outcrop--------	0-60	---	---	---	---	0.00-0.06	---	---	---	---	---	1	8	0
3:														
Bullwark------------	0-2	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	8	0
	2-9	---	---	8-18	1.45-1.55	2-6	0.05-0.07	0.0-1.0	0.5-1.5	.10	.28			
	9-15	---	---	10-27	1.55-1.65	2-6	0.05-0.07	0.0-1.6	0.0-1.0	.10	.28			
	15-23	---	---	10-27	1.55-1.75	0.6-6	0.05-0.09	0.0-1.6	0.0-1.0	.10	.24			
	23-32	---	---	---	---	0.00-0.2	---	---	---	---	---			
	32-60	---	---	---	---	0.00-0.06	---	---	---	---	---			
Catamount-----------	0-1	---	---	5-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	2	3	86
	1-3	---	---	5-18	1.35-1.45	2-6	0.07-0.09	0.0-2.0	0.5-2.0	.15	.24			
	3-10	---	---	5-18	1.35-1.45	2-6	0.05-0.06	0.0-1.0	0.0-0.5	.10	.28			
	10-14	---	---	5-18	1.35-1.45	2-6	0.05-0.06	0.0-1.0	0.0-0.5	.10	.28			
	14-24	---	---	---	---	0.00-0.2	---	---	---	---	---			
4:														
Catamount-----------	0-1	---	---	5-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	2	3	86
	1-3	---	---	5-18	1.35-1.45	2-6	0.07-0.09	0.0-2.0	0.5-2.0	.15	.24			
	3-10	---	---	5-18	1.35-1.45	2-6	0.05-0.06	0.0-1.0	0.0-0.5	.10	.28			
	10-14	---	---	5-18	1.35-1.45	2-6	0.05-0.06	0.0-1.0	0.0-0.5	.10	.28			
	14-24	---	---	---	---	0.00-0.2	---	---	---	---	---			
5:														
Catamount-----------	0-1	---	---	---	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	2	3	86
	1-3	---	---	5-18	1.35-1.45	2-6	0.07-0.09	0.0-2.0	0.5-2.0	.15	.24			
	3-10	---	---	5-18	1.35-1.45	2-6	0.05-0.06	0.0-1.0	0.0-0.5	.10	.28			
	10-14	---	---	5-18	1.35-1.45	2-6	0.05-0.06	0.0-1.0	0.0-0.5	.10	.28			
	14-24	---	---	---	---	0.00-0.2	---	---	---	---	---			
Bullwark------------	0-2	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	8	0
	2-9	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.0	0.5-1.5	.10	.28			
	9-15	---	---	10-27	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.0-1.0	.10	.28			
	15-23	---	---	10-27	1.25-1.45	0.6-6	0.05-0.09	0.0-1.6	0.0-1.0	.10	.24			
	23-32	---	---	---	---	0.00-0.2	---	---	---	---	---			
	32-60	---	---	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-60	---	---	---	---	0.00-0.06	---	---	---	---	---	1	8	0

Table 17.--Physical soil properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In.	Pct.	Pct.	Pct.	g/cc	In./hr.	In./in.	Pct.	Pct.					
6:														
Enentah-------------	0-6	---	---	10-20	1.25-1.35	2-6	0.07-0.09	0.0-1.6	0.5-2.0	.15	.37	2	8	0
	6-20	---	---	8-18	1.25-1.35	2-6	0.05-0.07	0.0-1.6	0.0-1.0	.10	.32			
	20-34	---	---	8-18	1.25-1.45	2-6	0.03-0.05	0.0-1.0	0.0-1.0	.05	.32			
	34-56	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	0.0-0.5	.05	.32			
	56-72	---	---	5-15	1.35-1.55	6-20	0.02-0.04	0.0-1.0	0.0-0.5	.05	.28			
7:														
Enentah-------------	0-6	---	---	10-20	1.25-1.35	2-6	0.07-0.09	0.0-1.6	0.5-2.0	.15	.37	2	8	0
	6-20	---	---	8-18	1.25-1.35	2-6	0.05-0.07	0.0-1.6	0.0-1.0	.10	.32			
	20-34	---	---	8-18	1.25-1.45	2-6	0.03-0.05	0.0-1.6	0.0-1.0	.05	.32			
	34-56	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	0.0-0.5	.05	.32			
	56-72	---	---	5-15	1.35-1.55	6-20	0.02-0.04	0.0-1.0	0.0-0.5	.05	.28			
Rubble land---------	0-60	---	---	---	---	20-100	---	---	---	---	---	--	8	0
8:														
Fallriver-----------	0-2	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	3	86
	2-9	---	---	8-18	1.35-1.45	2-6	0.07-0.10	0.0-2.9	0.5-1.0	.15	.28			
	9-21	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-2.0	.10	.24			
	21-35	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-1.0	.10	.24			
	35-63	---	---	5-15	1.35-1.55	2-6	0.03-0.06	0.0-1.0	0.0-0.5	.10	.20			
9:														
Fallriver, warm-----	0-2	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	3	86
	2-9	---	---	8-18	1.35-1.45	2-6	0.07-0.10	0.0-2.9	0.5-1.0	.15	.28			
	9-21	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-2.0	.10	.24			
	21-35	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-1.0	.10	.24			
	35-63	---	---	5-15	1.35-1.55	2-6	0.03-0.06	0.0-1.0	0.0-0.5	.10	.20			
10:														
Fallriver-----------	0-2	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	3	86
	2-9	---	---	8-18	1.35-1.45	2-6	0.07-0.10	0.0-2.9	0.5-1.0	.15	.28			
	9-21	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-2.0	.10	.24			
	21-35	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-1.0	.10	.24			
	35-63	---	---	5-15	1.35-1.55	2-6	0.03-0.06	0.0-1.0	0.0-0.5	.10	.20			
Hiamovi-------------	0-5	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	0.5-2.0	.05	.28	1	8	0
	5-13	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	0.0-0.5	.05	.24			
	13-60	---	---	---	---	0.00-0.06	---	---	---	---	---			
11:														
Fallriver-----------	0-2	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	3	86
	2-9	---	---	8-18	1.35-1.45	2-6	0.07-0.10	0.0-2.9	0.5-1.0	.15	.28			
	9-21	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-2.0	.10	.24			
	21-35	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-1.0	.10	.24			
	35-63	---	---	5-15	1.35-1.55	2-6	0.03-0.06	0.0-1.0	0.0-0.5	.10	.20			
Rock outcrop--------	0-60	---	---	---	---	0.00-0.06	---	---	---	---	---	1	8	0
12:														
Galuche-------------	0-1	---	---	10-20	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	1	8	0
	1-3	---	---	10-20	1.35-1.50	2-6	0.05-0.07	0.0-1.6	1.0-3.0	.10	.24			
	3-9	---	---	8-18	1.35-1.50	2-6	0.05-0.07	0.0-1.6	0.5-1.0	.10	.28			
	9-19	---	---	8-18	1.35-1.50	2-6	0.05-0.07	0.0-1.6	0.0-1.0	.10	.28			
	19-60	---	---	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-60	---	---	---	---	0.00-0.06	---	---	---	---	---	1	8	0
13:														
Granile-------------	0-3	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	8	0
	3-8	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.0	0.5-1.0	.10	.24			
	8-21	---	---	10-18	1.25-1.45	2-6	0.05-0.07	0.0-0.8	0.5-1.0	.05	.28			
	21-43	---	---	20-35	1.25-1.35	0.6-2	0.07-0.11	1.0-2.0	0.5-1.0	.05	.20			
	43-65	---	---	15-27	1.25-1.45	0.6-2	0.05-0.09	1.0-3.0	0.0-0.5	.10	.28			
14:														
Hiamovi-------------	0-5	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	0.5-2.0	.05	.28	1	8	0
	5-13	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	0.0-0.5	.05	.24			
	13-60	---	---	---	---	0.00-0.06	---	---	---	---	---			

Table 17.--Physical soil properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In.	Pct.	Pct.	Pct.	g/cc	In./hr.	In./in.	Pct.	Pct.					
14:														
Rock outcrop--------	0-60	---	---	---	---	0.00-0.06	---	---	---	---	---	1	8	0
15:														
Hiamovi-------------	0-5	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	0.5-2.0	.05	.28	1	8	0
	5-13	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	0.0-0.5	.05	.24			
	13-60	---	---	---	---	0.00-0.06	---	---	---	---	---			
Rock outcrop--------	0-60	---	---	---	---	0.00-0.06	---	---	---	---	---	1	8	0
16:														
Isolation-----------	0-1	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	3	86
	1-6	---	---	8-18	1.25-1.45	2-6	0.07-0.10	0.0-2.9	1.0-3.0	.15	.24			
	6-11	---	---	8-18	1.25-1.45	2-6	0.05-0.07	0.0-1.6	1.0-3.0	.10	.24			
	11-24	---	---	10-20	1.50-1.65	2-6	0.03-0.04	0.0-1.0	0.0-0.5	.05	.32			
	24-33	---	---	10-20	1.50-1.65	2-6	0.03-0.04	0.0-1.0	0.0-0.5	.05	.32			
	33-39	---	---	0-10	1.60-1.70	20-40	0.01-0.02	0.0-0.2	0.0-0.0	.02	.10			
	39-51	---	---	0-8	1.60-1.70	20-40	0.02-0.04	0.0-0.2	0.0-0.0	.02	.10			
	51-72	---	---	0-10	1.60-1.70	6-20	0.05-0.06	0.0-0.5	0.0-0.0	.15	.15			
17:														
Kawuneeche----------	0-6	---	---	20-27	1.15-1.25	0.6-2	0.13-0.16	0.0-5.0	2.0-5.0	.20	.20	3	6	48
	6-12	---	---	20-27	1.15-1.25	0.6-2	0.13-0.16	0.0-2.9	2.0-5.0	.20	.20			
	12-20	---	---	8-18	1.35-1.50	2-6	0.05-0.07	0.0-2.9	1.0-5.0	.05	.20			
	20-35	---	---	5-18	1.60-1.70	6-20	0.03-0.04	0.0-1.2	0.0-1.0	.05	.15			
	35-61	---	---	1-7	1.35-1.75	6-20	0.01-0.02	0.0-0.2	0.0-0.0	.02	.10			
18:														
Kawuneeche----------	0-5	---	---	---	0.50-0.90	2-6	0.23-0.25	---	25-50	---	---	3	7	38
	5-12	---	---	20-35	1.25-1.35	0.6-2	0.13-0.19	0.0-5.0	6.0-12	.20	.20			
	12-23	---	---	8-18	1.25-1.35	0.6-2	0.13-0.18	0.0-2.9	3.0-7.0	.37	.37			
	23-31	---	---	5-18	1.35-1.45	2-6	0.08-0.12	0.0-2.0	0.0-1.0	.28	.28			
	31-66	---	---	1-7	1.45-1.55	6-20	0.03-0.05	0.0-0.3	0.0-1.0	.05	.20			
19:														
Kawuneeche, low precipitation------	0-5	---	---	---	0.50-0.90	2-6	0.23-0.25	---	20-40	---	---	3	6	48
	5-12	---	---	20-35	1.25-1.35	0.6-2	0.13-0.19	0.0-5.0	6.0-12	.20	.20			
	12-23	---	---	8-18	1.20-1.35	0.6-2	0.13-0.18	0.0-2.9	0.5-2.0	.37	.37			
	23-31	---	---	5-18	1.35-1.50	2-6	0.08-0.12	0.0-2.0	0.0-1.0	.28	.28			
	31-66	---	---	1-7	1.60-1.70	6-20	0.03-0.05	0.0-0.3	0.0-1.0	.05	.20			
20:														
Kawuneeche----------	0-5	---	---	---	0.50-0.90	2-6	0.23-0.25	---	20-40	---	---	3	7	38
	5-12	---	---	20-35	1.25-1.35	0.6-2	0.13-0.19	0.0-5.0	6.0-12	.20	.20			
	12-23	---	---	8-18	1.25-1.35	0.6-2	0.13-0.18	0.0-2.9	0.5-2.0	.37	.37			
	23-31	---	---	5-18	1.35-1.45	2-6	0.08-0.12	0.0-2.0	0.0-1.0	.28	.28			
	31-66	---	---	1-7	1.45-1.55	6-20	0.03-0.05	0.0-0.3	0.0-1.0	.05	.20			
Dystrocryepts-------	0-8	---	---	10-20	1.25-1.35	2-6	0.13-0.16	0.0-2.9	3.0-5.0	.20	.20	4	5	56
	8-20	---	---	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.28	.28			
	20-30	---	---	10-18	1.25-1.45	2-6	0.09-0.15	0.0-2.9	0.0-1.0	.32	.32			
	30-60	---	---	8-18	1.25-1.45	2-6	0.05-0.09	0.0-1.6	0.0-1.0	.15	.32			
21:														
Legault-------------	0-1	---	---	5-15	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	2	8	0
	1-3	---	---	5-15	1.35-1.50	6-20	0.05-0.07	0.0-1.6	0.5-1.0	.10	.28			
	3-8	---	---	1-5	1.45-1.60	6-20	0.01-0.02	0.0-0.2	0.0-0.5	.05	.24			
	8-12	---	---	1-5	1.45-1.60	6-20	0.01-0.02	0.0-0.2	0.0-0.5	.05	.24			
	12-22	---	---	---	---	0.00-0.2	---	---	---	---	---			
22:														
Lumpyridge----------	0-6	---	---	8-18	1.35-1.50	2-6	0.07-0.10	0.0-2.0	2.0-4.0	.15	.24	5	3	86
	6-11	---	---	8-18	1.35-1.50	2-6	0.07-0.10	0.0-2.9	1.0-3.0	.24	.24			
	11-25	---	---	18-22	1.25-1.50	0.6-2	0.07-0.13	0.0-2.9	0.5-2.0	.15	.24			
	25-39	---	---	18-30	1.25-1.50	0.6-2	0.07-0.13	3.0-5.0	0.5-1.0	.10	.24			
	39-45	---	---	3-10	1.35-1.60	2-6	0.03-0.06	0.0-1.0	0.0-1.0	.10	.20			
	45-80	---	---	0-7	1.35-1.60	6-20	0.02-0.04	0.0-0.3	0.0-0.5	.05	.15			

Table 17.--Physical soil properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In.	Pct.	Pct.	Pct.	g/cc	In./hr.	In./in.	Pct.	Pct.					
23:														
Lumpyridge----------	0-6	---	---	8-18	1.35-1.50	2-6	0.07-0.10	0.0-2.0	2.0-4.0	.15	.24	5	3	86
	6-11	---	---	8-18	1.35-1.50	2-6	0.07-0.10	0.0-2.9	1.0-3.0	.24	.24			
	11-25	---	---	18-22	1.25-1.50	0.6-2	0.07-0.13	0.0-2.9	0.5-2.0	.15	.24			
	25-39	---	---	18-30	1.25-1.50	0.6-2	0.07-0.13	3.0-5.0	0.5-1.0	.10	.24			
	39-45	---	---	3-10	1.35-1.60	2-6	0.03-0.06	0.0-1.0	0.0-1.0	.10	.20			
	45-80	---	---	0-7	1.35-1.60	6-20	0.02-0.04	0.0-0.2	0.0-0.5	.05	.15			
Rofork--------------	0-5	---	---	12-18	1.25-1.35	2-6	0.05-0.07	0.0-1.6	2.0-5.0	.05	.20	2	8	0
	5-10	---	---	12-18	1.30-1.45	2-6	0.05-0.07	0.0-1.6	1.0-4.0	.10	.24			
	10-14	---	---	5-10	1.55-1.70	6-20	0.01-0.02	0.0-0.2	0.0-1.0	.02	.15			
	14-24	---	---	---	---	0.00-0.2	---	---	---	---	---			
24:														
Mummy---------------	0-5	---	---	10-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	2.0-6.0	.02	.15	3	8	0
	5-24	---	---	10-20	1.35-1.45	2-6	0.03-0.04	0.0-1.0	1.0-3.0	.05	.24			
	24-72	---	---	8-18	1.35-1.55	2-6	0.03-0.07	0.0-1.0	0.0-1.0	.10	.28			
25:														
Mummy---------------	0-10	---	---	10-18	1.25-1.35	2-6	0.10-0.13	0.0-2.9	3.0-7.0	.15	.24	3	7	38
	10-21	---	---	10-20	1.25-1.35	2-6	0.05-0.09	0.0-1.6	1.0-3.0	.10	.24			
	21-63	---	---	8-18	1.25-1.35	2-6	0.05-0.09	0.0-1.6	0.5-1.0	.10	.28			
26:														
Nanita--------------	0-1	---	---	5-10	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	2	8	0
	1-2	---	---	5-10	1.45-1.55	6-20	0.02-0.03	0.0-0.2	0.0-1.0	.02	.20			
	2-7	---	---	3-8	1.45-1.55	6-20	0.02-0.03	0.0-0.2	0.0-0.5	.05	.24			
	7-18	---	---	3-8	1.45-1.55	2-6	0.02-0.03	0.0-0.2	0.0-0.5	.05	.24			
	18-72	---	---	3-10	1.45-1.65	20-100	0.02-0.03	0.0-0.2	0.0-0.5	.05	.24			
27:														
Nanita--------------	0-1	---	---	5-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	2	8	0
	1-8	---	---	5-18	1.35-1.45	6-20	0.05-0.07	0.0-1.6	0.5-2.0	.10	.28			
	8-18	---	---	3-8	1.45-1.55	6-20	0.02-0.03	0.0-0.2	0.0-0.5	.05	.24			
	18-28	---	---	3-18	1.45-1.55	2-6	0.02-0.04	0.0-1.0	0.0-0.5	.02	.32			
	28-72	---	---	2-8	1.45-1.55	20-100	0.01-0.02	0.0-0.2	0.0-0.5	.02	.15			
28:														
Nanita--------------	0-1	---	---	5-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	2	8	0
	1-10	---	---	5-18	1.35-1.45	6-20	0.05-0.07	0.0-1.6	0.0-0.5	.10	.32			
	10-23	---	---	0-8	1.45-1.55	6-20	0.02-0.03	0.0-0.2	0.0-0.0	.05	.24			
	23-41	---	---	0-18	1.60-1.70	2-6	0.01-0.02	0.0-1.0	0.0-0.0	.02	.20			
	41-71	---	---	0-18	1.60-1.70	20-100	0.01-0.02	0.0-1.0	0.0-0.0	.02	.20			
29:														
Nanita--------------	0-4	---	---	5-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	2	8	0
	4-6	---	---	5-18	1.35-1.45	6-20	0.07-0.09	0.0-2.9	0.5-2.0	.15	.24			
	6-15	---	---	5-18	1.35-1.45	6-20	0.03-0.04	0.0-0.3	0.0-0.5	.10	.24			
	15-26	---	---	1-8	1.45-1.55	6-20	0.02-0.04	0.0-0.2	0.0-0.5	.05	.20			
	26-43	---	---	3-8	1.45-1.55	2-6	0.01-0.03	0.0-0.2	0.0-0.5	.05	.20			
	43-71	---	---	2-8	1.45-1.55	6-20	0.01-0.02	0.0-0.2	0.0-0.5	.02	.10			
Rock outcrop--------	0-60	---	---	---	---	0.00-0.06	---	---	---	---	---	1	8	0
30:														
Onahu---------------	0-7	---	---	10-18	1.25-1.35	0.6-2	0.13-0.16	0.0-2.9	3.0-5.0	.20	.20	3	5	56
	7-16	---	---	10-18	1.25-1.45	2-6	0.09-0.15	0.0-2.9	1.0-5.0	.24	.24			
	16-24	---	---	10-18	1.25-1.45	2-6	0.05-0.09	0.0-1.6	0.0-1.0	.15	.32			
	24-45	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.0-1.0	.10	.28			
	45-55	---	---	---	---	0.00-0.2	---	---	---	---	---			
Terric Cryofibrists-	0-19	---	---	15-25	---	14-85	0.20-0.25	---	25-75	.05	.05	3	8	0
	19-21	---	---	15-25	---	0.6-2	0.20-0.25	---	25-50	.05	.05			
	21-32	---	---	15-25	1.25-1.40	0.6-2	0.13-0.16	3.0-5.0	1.0-3.0	.28	.28			
	32-53	---	---	5-20	1.25-1.60	2-6	0.05-0.16	0.0-5.0	0.5-3.0	.24	.24			
	53-60	---	---	1-15	1.25-1.60	2-6	0.03-0.07	0.0-1.6	0.0-2.0	.10	.24			
Trailridge----------	0-6	---	---	8-18	1.35-1.45	2-6	0.03-0.05	0.0-1.0	1.0-4.0	.05	.24	2	8	0
	6-11	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	1.0-4.0	.05	.24			
	11-19	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-0.8	0.5-2.0	.05	.28			
	19-29	---	---	---	---	0.00-0.2	---	---	---	---	---			

Table 17.--Physical soil properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In.	Pct.	Pct.	Pct.	g/cc	In./hr.	In./in.	Pct.	Pct.					
31:														
Peeler--------------	0-2	---	---	15-25	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	5	5	56
	2-10	---	---	15-25	1.25-1.35	0.6-2	0.14-0.18	3.0-5.0	0.5-2.0	.37	.37			
	10-22	---	---	20-35	1.25-1.35	0.6-2	0.13-0.16	3.0-5.0	0.0-1.0	.20	.20			
	22-40	---	---	20-35	1.25-1.35	0.2-0.6	0.13-0.19	3.0-5.0	0.0-1.0	.24	.24			
	40-62	---	---	18-27	1.25-1.45	0.6-2	0.07-0.13	3.0-5.0	0.0-0.5	.15	.24			
32:														
Rock outcrop--------	0-60	---	---	---	---	0.00-0.06	---	---	---	---	---	1	8	0
Cathedral-----------	0-9	---	---	8-18	1.35-1.50	2-6	0.05-0.07	0.0-1.6	1.0-3.0	.10	.24	1	8	0
	9-15	---	---	5-18	1.35-1.50	2-6	0.03-0.05	0.0-1.0	0.5-1.0	.05	.28			
	15-60	---	---	---	---	0.00-0.06	---	---	---	---	---			
33:														
Rock outcrop--------	0-60	---	---	---	---	0.00-0.06	---	---	---	---	---	1	8	0
Rubble land---------	0-60	---	---	---	---	20-100	---	---	---	---	---	--	8	0
34:														
Rock outcrop--------	0-60	---	---	---	---	0.00-0.06	---	---	---	---	---	1	8	0
Rubble land---------	0-60	---	---	---	---	20-100	---	---	---	---	---	--	8	0
Enentah-------------	0-6	---	---	10-20	1.25-1.35	2-6	0.07-0.09	0.0-1.6	0.5-2.0	.15	.37	2	8	0
	6-20	---	---	8-18	1.25-1.35	2-6	0.05-0.07	0.0-1.6	0.0-1.0	.10	.32			
	20-34	---	---	8-18	1.25-1.45	2-6	0.03-0.05	0.0-1.0	0.0-1.0	.05	.32			
	34-56	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	0.0-0.5	.05	.32			
	56-72	---	---	5-15	1.35-1.45	6-20	0.02-0.04	0.0-1.0	0.0-0.5	.05	.28			
35:														
Rofork--------------	0-5	---	---	12-18	1.25-1.35	2-6	0.05-0.07	0.0-1.6	2.0-5.0	.05	.20	2	8	0
	5-10	---	---	12-18	1.30-1.45	2-6	0.05-0.07	0.0-1.6	1.0-4.0	.10	.24			
	10-14	---	---	5-10	1.55-1.70	6-20	0.01-0.02	0.0-0.2	0.0-1.0	.02	.15			
	14-24	---	---	---	---	0.00-0.2	---	---	---	---	---			
Chasmfalls----------	0-4	---	---	8-18	1.25-1.35	2-6	0.07-0.10	0.0-2.9	2.0-5.0	.10	.15	3	3	86
	4-13	---	---	8-18	1.25-1.35	2-6	0.07-0.09	0.0-2.0	1.0-5.0	.10	.17			
	13-19	---	---	8-18	1.35-1.50	2-6	0.07-0.10	0.0-2.9	1.0-4.0	.15	.24			
	19-28	---	---	8-16	1.35-1.50	2-6	0.07-0.10	0.0-2.9	0.5-3.0	.15	.24			
	28-38	---	---	---	---	0.00-0.2	---	---	---	---	---			
36:														
Rofork--------------	0-5	---	---	12-18	1.25-1.35	2-6	0.05-0.07	0.0-1.6	2.0-5.0	.05	.20	2	8	0
	5-10	---	---	12-18	1.30-1.45	2-6	0.05-0.07	0.0-1.6	1.0-4.0	.10	.24			
	10-14	---	---	5-10	1.55-1.70	6-20	0.01-0.02	0.0-0.2	0.0-1.0	.02	.15			
	14-24	---	---	---	---	0.00-0.2	---	---	---	---	---			
Isolation-----------	0-1	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	3	86
	1-6	---	---	8-18	1.25-1.35	2-6	0.07-0.10	0.0-2.9	1.0-3.0	.15	.24			
	6-11	---	---	8-18	1.25-1.35	2-6	0.05-0.07	0.0-1.6	1.0-3.0	.10	.24			
	11-24	---	---	10-20	1.50-1.65	2-6	0.03-0.04	0.0-1.0	0.0-0.5	.05	.32			
	24-33	---	---	10-20	1.50-1.65	2-6	0.03-0.04	0.0-1.0	0.0-0.5	.05	.32			
	33-39	---	---	0-10	1.60-1.70	20-40	0.01-0.02	0.0-0.2	0.0-0.0	.02	.10			
	39-51	---	---	0-8	1.60-1.70	20-40	0.02-0.04	0.0-0.2	0.0-0.0	.02	.10			
	51-72	---	---	0-10	1.60-1.70	6-20	0.05-0.06	0.0-0.5	0.0-0.0	.15	.15			
37:														
Rubble land---------	0-60	---	---	---	---	20-100	---	---	---	---	---	--	8	0
38:														
Terric Cryofibrists-	0-19	---	---	15-25	---	0.6-2	0.20-0.25	---	25-75	.05	.05	3	8	0
	19-21	---	---	15-25	---	0.6-2	0.20-0.25	---	25-50	.05	.05			
	21-32	---	---	15-25	1.25-1.40	0.6-2	0.13-0.16	3.0-5.0	1.0-3.0	.28	.28			
	32-53	---	---	5-20	1.25-1.60	0.6-6	0.05-0.16	0.0-2.9	0.5-3.0	.24	.24			
	53-60	---	---	1-15	1.25-1.60	2-6	0.03-0.07	0.0-1.6	0.0-2.0	.10	.24			

Table 17.--Physical soil properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In.	Pct.	Pct.	Pct.	g/cc	In./hr.	In./in.	Pct.	Pct.					
39:														
Tileston------------	0-3	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	8	0
	3-7	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.6	0.5-2.0	.10	.28			
	7-13	---	---	10-25	1.25-1.45	0.6-2	0.05-0.09	0.0-1.6	0.5-1.0	.10	.24			
	13-28	---	---	10-30	1.25-1.45	0.6-2	0.03-0.05	0.0-2.0	0.0-1.0	.05	.24			
	28-36	---	---	18-30	1.25-1.45	0.6-2	0.03-0.05	1.0-2.0	0.0-1.0	.02	.24			
	36-64	---	---	5-15	1.40-1.60	2-6	0.01-0.04	0.0-1.0	0.0-0.5	.05	.28			
40:														
Tonahutu------------	0-1	---	---	10-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	8	0
	1-6	---	---	10-18	1.35-1.45	2-6	0.07-0.09	0.0-1.6	0.5-2.0	.10	.28			
	6-21	---	---	5-27	1.25-1.45	0.6-2	0.03-0.05	0.0-3.0	0.0-1.0	.10	.28			
	21-35	---	---	5-27	1.25-1.45	0.6-2	0.03-0.05	0.0-3.0	0.0-1.0	.10	.28			
	35-45	---	---	5-27	1.25-1.45	0.6-2	0.03-0.05	0.0-3.0	0.0-1.0	.10	.28			
	45-62	---	---	5-15	1.45-1.55	6-20	0.03-0.04	0.0-0.3	0.0-0.5	.10	.24			
41:														
Tonahutu------------	0-1	---	---	10-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	8	0
	1-6	---	---	10-18	1.35-1.45	2-6	0.07-0.09	0.0-1.6	0.5-2.0	.10	.28			
	6-21	---	---	5-27	1.25-1.45	0.6-2	0.03-0.05	0.0-3.0	0.0-1.0	.10	.28			
	21-35	---	---	5-27	1.25-1.45	0.6-2	0.03-0.05	0.0-3.0	0.0-1.0	.10	.28			
	35-45	---	---	5-27	1.25-1.45	0.6-2	0.03-0.05	0.0-3.0	0.0-1.0	.10	.28			
	45-62	---	---	5-15	1.45-1.55	6-20	0.03-0.04	0.0-0.3	0.0-0.5	.10	.24			
42:														
Trailridge----------	0-6	---	---	8-18	1.35-1.45	2-6	0.03-0.05	0.0-1.0	1.0-4.0	.05	.24	2	8	0
	6-11	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	1.0-4.0	.05	.24			
	11-19	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-0.8	0.5-2.0	.05	.28			
	19-29	---	---	---	---	0.00-0.2	---	---	---	---	---			
Archrock------------	0-8	---	---	10-18	1.25-1.35	2-6	0.10-0.13	0.0-2.9	1.0-5.0	.15	.24	2	5	56
	8-18	---	---	10-18	1.25-1.35	2-6	0.07-0.09	0.0-1.6	0.5-2.0	.15	.37			
	18-25	---	---	5-18	1.35-1.45	2-6	0.05-0.07	0.0-1.0	0.0-2.0	.10	.24			
	25-35	---	---	---	---	0.00-0.2	---	---	---	---	---			
43:														
Trailridge----------	0-6	---	---	8-18	1.35-1.45	2-6	0.03-0.05	0.0-1.0	1.0-4.0	.05	.24	2	8	0
	6-11	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-1.0	1.0-4.0	.05	.24			
	11-19	---	---	8-18	1.35-1.45	2-6	0.03-0.04	0.0-0.8	0.5-2.0	.05	.28			
	19-29	---	---	---	---	0.00-0.2	---	---	---	---	---			
Mummy---------------	0-10	---	---	10-18	1.25-1.35	2-6	0.10-0.13	0.0-2.9	3.0-7.0	.15	.24	3	7	38
	10-21	---	---	10-20	1.25-1.45	2-6	0.05-0.09	0.0-1.6	1.0-3.0	.10	.24			
	21-63	---	---	8-18	1.25-1.45	2-6	0.05-0.09	0.0-1.6	0.5-1.0	.10	.28			
44:														
Venable-------------	0-3	---	---	---	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	5	6	48
	3-9	---	---	18-25	1.15-1.25	0.6-2	0.13-0.16	3.0-5.0	2.0-6.0	.20	.20			
	9-14	---	---	18-25	1.15-1.25	0.6-2	0.13-0.16	3.0-5.0	2.0-6.0	.20	.20			
	14-31	---	---	20-30	1.25-1.40	0.6-2	0.13-0.16	3.0-5.0	2.0-5.0	.10	.10			
	31-43	---	---	3-10	1.60-1.70	2-6	0.04-0.08	0.0-0.5	0.0-1.0	.10	.15			
	43-63	---	---	26-35	1.35-1.50	0.2-0.6	0.07-0.11	1.0-2.0	0.0-1.0	.10	.32			
45:														
Ypsilon-------------	0-6	---	---	8-18	0.20-1.00	14-85	0.15-0.45	---	70-95	---	---	3	8	0
	6-14	---	---	8-18	1.35-1.45	2-6	0.07-0.09	0.0-2.0	0.8-1.5	.15	.28			
	14-19	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.0	1.5-2.2	.10	.24			
	19-24	---	---	8-18	1.35-1.45	2-6	0.05-0.07	0.0-1.0	1.8-2.5	.05	.24			
	24-35	---	---	8-18	1.35-1.45	2-6	0.03-0.05	0.0-1.0	1.8-2.2	.05	.24			
	35-67	---	---	1-5	1.35-1.55	6-20	0.01-0.03	0.0-0.2	0.0-1.2	.02	.20			
46:														
Water---------------	---	---	---	---	---	---	---	---	---	---	---	--	---	---

Table 18.--Chemical soil properties

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
1:								
Archrock-------------	0-8	5.0-20	---	4.5-5.5	0	0	0	0
	8-18	4.0-15	---	4.5-6.0	0	0	0	0
	18-25	2.0-15	---	4.5-6.0	0	0	0	0
	25-35	---	---	---	---	---	---	---
Fallriver------------	0-2	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	2-9	4.0-15	---	4.5-5.5	0	0	0	0
	9-21	4.0-15	---	4.5-5.5	0	0	0	0
	21-35	4.0-15	---	4.5-5.5	0	0	0	0
	35-63	2.0-10	---	4.5-6.0	0	0	0	0
2:								
Archrock-------------	0-8	5.0-20	---	4.5-5.5	0	0	0	0
	8-18	4.0-15	---	4.5-6.0	0	0	0	0
	18-25	2.0-15	---	4.5-6.0	0	0	0	0
	25-35	---	---	---	---	---	---	---
Onahu----------------	0-7	10-20	---	4.5-5.5	0	0	0	0
	7-16	5.0-20	---	4.5-5.5	0	0	0	0
	16-24	3.0-15	---	4.5-5.5	0	0	0	0
	24-45	2.0-14	---	4.5-5.5	0	0	0	0
	45-55	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---	---
3:								
Bullwark-------------	0-2	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	2-9	5.0-15	---	5.6-6.5	0	0	0	0
	9-15	5.0-15	---	5.6-6.5	0	0	0	0
	15-23	4.0-15	---	5.6-6.5	0	0	0	0
	23-32	---	---	---	---	---	---	---
	32-60	---	---	---	---	---	---	---
Catamount------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-3	3.0-15	---	5.1-6.5	0	0	0	0
	3-10	2.0-10	---	5.1-6.5	0	0	0	0
	10-14	2.0-10	---	5.1-6.0	0	0	0	0
	14-24	---	---	---	---	---	---	---

Table 18.--Chemical soil properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
4:								
Catamount------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-3	3.0-15	---	5.1-6.5	0	0	0	0
	3-10	2.0-10	---	5.1-6.5	0	0	0	0
	10-14	2.0-10	---	5.1-6.0	0	0	0	0
	14-24	---	---	---	---	---	---	---
5:								
Catamount------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-3	3.0-15	---	5.1-6.5	0	0	0	0
	3-10	2.0-10	---	5.1-6.5	0	0	0	0
	10-14	2.0-10	---	5.1-6.0	0	0	0	0
	14-24	---	---	---	---	---	---	---
Bullwark-------------	0-2	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	2-9	5.0-15	---	5.6-6.5	0	0	0	0
	9-15	5.0-15	---	5.6-6.5	0	0	0	0
	15-23	4.0-15	---	5.6-6.5	0	0	0	0
	23-32	---	---	---	---	---	---	---
	32-60	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---	---
6:								
Enentah--------------	0-6	5.0-15	---	5.1-6.0	0	0	0	0
	6-20	3.0-15	---	5.6-6.5	0	0	0	0
	20-34	3.0-15	---	5.6-6.5	0	0	0	0
	34-56	3.0-10	---	5.6-6.5	0	0	0	0
	56-72	2.0-10	---	5.6-6.5	0	0	0	0
7:								
Enentah--------------	0-6	5.0-15	---	5.1-6.0	0	0	0	0
	6-20	3.0-15	---	5.6-6.5	0	0	0	0
	20-34	3.0-15	---	5.6-6.5	0	0	0	0
	34-56	3.0-10	---	5.6-6.5	0	0	0	0
	56-72	2.0-10	---	5.6-6.5	0	0	0	0
Rubble land----------	0-60	---	---	---	---	---	---	---
8:								
Fallriver------------	0-2	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	2-9	4.0-15	---	4.5-5.5	0	0	0	0
	9-21	4.0-15	---	4.5-5.5	0	0	0	0
	21-35	4.0-15	---	4.5-5.5	0	0	0	0
	35-63	2.0-10	---	4.5-6.0	0	0	0	0

Table 18.--Chemical soil properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
9:								
Fallriver, warm------	0-2	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	2-9	4.0-15	---	4.5-5.5	0	0	0	0
	9-21	4.0-15	---	4.5-5.5	0	0	0	0
	21-35	4.0-15	---	4.5-5.5	0	0	0	0
	35-63	2.0-10	---	4.5-6.0	0	0	0	0
10:								
Fallriver-----------	0-2	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	2-9	4.0-15	---	4.5-5.5	0	0	0	0
	9-21	4.0-15	---	4.5-5.5	0	0	0	0
	21-35	4.0-15	---	4.5-5.5	0	0	0	0
	35-63	2.0-10	---	4.5-6.0	0	0	0	0
Hiamovi-------------	0-5	4.0-15	---	5.1-6.0	0	0	0	0
	5-13	3.0-15	---	5.1-6.0	0	0	0	0
	13-60	---	---	---	---	---	---	---
11:								
Fallriver-----------	0-2	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	2-9	4.0-15	---	4.5-5.5	0	0	0	0
	9-21	4.0-15	---	4.5-5.5	0	0	0	0
	21-35	4.0-15	---	4.5-5.5	0	0	0	0
	35-63	2.0-10	---	4.5-6.0	0	0	0	0
Rock outcrop---------	0-60	---	---	---	---	---	---	---
12:								
Galuche-------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-3	5.0-20	---	6.1-7.3	0	0	0	0
	3-9	4.0-15	---	5.1-6.0	0	0	0	0
	9-19	3.0-15	---	4.5-6.0	0	0	0	0
	19-60	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---	---
13:								
Granile-------------	0-3	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	3-8	4.0-15	---	5.6-6.5	0	0	0	0
	8-21	5.0-15	---	5.6-6.5	0	0	0	0
	21-43	10-25	---	5.6-6.5	0	0	0	0
	43-65	5.0-15	---	5.6-6.5	0	0	0	0

Table 18.--Chemical soil properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
14:								
Hiamovi--------------	0-5	4.0-15	---	5.1-6.0	0	0	0	0
	5-13	3.0-15	---	5.1-6.0	0	0	0	0
	13-60	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---	---
15:								
Hiamovi--------------	0-5	4.0-15	---	5.1-6.0	0	0	0	0
	5-13	3.0-15	---	5.1-6.0	0	0	0	0
	13-60	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---	---
16:								
Isolation------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-6	5.0-15	---	6.1-7.3	0	0	0	0
	6-11	5.0-15	---	6.1-7.3	0	0	0	0
	11-24	3.0-10	---	6.1-7.3	0	0	0	0
	24-33	3.0-10	---	6.1-7.3	0	0	0	0
	33-39	0.0-5.0	---	6.1-7.3	0	0	0	0
	39-51	0.0-5.0	---	6.1-7.3	0	0	0	0
	51-72	1.0-5.0	---	6.1-7.3	0	0	0	0
17:								
Kawuneeche-----------	0-6	10-25	---	4.5-5.5	0	0	0	0
	6-12	10-25	---	4.5-5.5	0	0	0	0
	12-20	5.0-20	---	5.1-6.0	0	0	0	0
	20-35	1.0-5.0	---	5.6-6.5	0	0	0	0
	35-61	1.0-5.0	---	5.6-6.5	0	0	0	0
18:								
Kawuneeche-----------	0-5	40-80	---	4.5-5.5	0	0	0	0
	5-12	20-45	---	4.5-5.5	0	0	0	0
	12-23	5.0-15	---	4.5-5.5	0	0	0	0
	23-31	3.0-15	---	5.6-6.5	0	0	0	0
	31-66	0.0-5.0	---	5.6-6.5	0	0	0	0
19:								
Kawuneeche, low precipitation-------	0-5	40-80	---	4.5-5.5	0	0	0	0
	5-12	20-45	---	4.5-5.5	0	0	0	0
	12-23	5.0-15	---	4.5-5.5	0	0	0	0
	23-31	3.0-15	---	5.6-6.5	0	0	0	0
	31-66	0.0-5.0	---	5.6-6.5	0	0	0	0

Table 18.--Chemical soil properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
20:								
Kawuneeche-----------	0-5	40-80	---	4.5-5.5	0	0	0	0
	5-12	20-45	---	4.5-5.5	0	0	0	0
	12-23	5.0-15	---	4.5-5.5	0	0	0	0
	23-31	3.0-15	---	5.6-6.5	0	0	0	0
	31-66	0.0-5.0	---	5.6-6.5	0	0	0	0
Dystrocryepts--------	0-8	10-20	---	4.5-5.5	0	0	0	0
	8-20	5.0-15	---	4.5-5.5	0	0	0	0
	20-30	4.0-14	---	4.5-6.0	0	0	0	0
	30-60	3.0-14	---	4.5-6.0	0	0	0	0
21:								
Legault--------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-3	3.0-10	---	5.5-6.5	0	0	0	0
	3-8	0.0-5.0	---	5.5-6.5	0	0	0	0
	8-12	0.0-5.0	---	5.5-6.5	0	0	0	0
	12-22	---	---	---	---	---	---	---
22:								
Lumpyridge-----------	0-6	5.0-15	---	6.1-7.3	0	0	0	0
	6-11	4.0-15	---	6.1-7.3	0	0	0	0
	11-25	10-20	---	6.1-7.3	0	0	0	0
	25-39	10-25	---	6.1-7.3	0	0	0	0
	39-45	1.0-11	---	6.1-7.3	0	0	0	0
	45-80	0.0-5.0	---	6.1-7.3	0	0	0	0
23:								
Lumpyridge-----------	0-6	5.0-15	---	6.1-7.3	0	0	0	0
	6-11	4.0-15	---	6.1-7.3	0	0	0	0
	11-25	10-20	---	6.1-7.3	0	0	0	0
	25-39	10-25	---	6.1-7.3	0	0	0	0
	39-45	1.0-11	---	6.1-7.3	0	0	0	0
	45-80	0.0-5.0	---	6.1-7.3	0	0	0	0
Rofork---------------	0-5	10-20	---	6.1-7.3	0	0	0	0
	5-10	5.0-20	---	6.1-7.3	0	0	0	0
	10-14	2.0-10	---	6.1-7.3	0	0	0	0
	14-24	---	---	---	---	---	---	---
24:								
Mummy----------------	0-5	10-25	---	4.5-5.5	0	0	0	0
	5-24	5.0-25	---	4.5-5.5	0	0	0	0
	24-72	3.0-15	---	4.5-6.0	0	0	0	0

Table 18.--Chemical soil properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
25:								
Mummy----------------	0-10	10-20	---	4.5-5.5	0	0	0	0
	10-21	5.0-20	---	4.5-5.5	0	0	0	0
	21-63	3.0-18	---	4.5-6.0	0	0	0	0
26:								
Nanita---------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-2	2.0-10	---	5.1-7.3	0	0	0	0
	2-7	1.0-5.0	---	5.6-7.3	0	0	0	0
	7-18	1.0-5.0	---	5.6-7.3	0	0	0	0
	18-72	1.0-5.0	---	5.6-7.3	0	0	0	0
27:								
Nanita---------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-8	3.0-10	---	5.1-7.3	0	0	0	0
	8-18	1.0-5.0	---	5.6-6.5	0	0	0	0
	18-28	1.0-6.0	---	5.6-6.5	0	0	0	0
	28-72	1.0-5.0	---	5.6-6.5	0	0	0	0
28:								
Nanita---------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-10	3.0-10	---	5.1-7.3	0	0	0	0
	10-23	1.0-5.0	---	5.6-7.3	0	0	0	0
	23-41	0.0-5.0	---	5.6-7.3	0	0	0	0
	41-71	0.0-5.0	---	5.6-7.3	0	0	0	0
29:								
Nanita---------------	0-4	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	4-6	3.0-15	---	5.1-7.3	0	0	0	0
	6-15	1.0-5.0	---	5.1-7.3	0	0	0	0
	15-26	0.0-5.0	---	5.6-6.5	0	0	0	0
	26-43	1.0-6.0	---	5.6-6.5	0	0	0	0
	43-71	0.0-5.0	---	5.6-6.5	0	0	0	0
Rock outcrop---------	0-60	---	---	---	---	---	---	---
30:								
Onahu----------------	0-7	10-20	---	4.5-5.5	0	0	0	0
	7-16	5.0-20	---	4.5-5.5	0	0	0	0
	16-24	3.0-15	---	4.5-5.5	0	0	0	0
	24-45	2.0-14	---	4.5-5.5	0	0	0	0
	45-55	---	---	---	---	---	---	---

Table 18.--Chemical soil properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
30:								
Terric Cryofibrists--	0-19	50-150	---	4.5-5.5	0	0	0	0
	19-21	50-100	---	4.5-5.5	0	0	0	0
	21-32	10-20	---	4.5-5.5	0	0	0	0
	32-53	3.0-20	---	4.5-5.5	0	0	0	0
	53-60	0.0-15	---	4.5-6.0	0	0	0	0
Trailridge-----------	0-6	5.0-25	---	4.5-5.5	0	0	0	0
	6-11	5.0-25	---	4.5-5.5	0	0	0	0
	11-19	4.0-15	---	4.5-6.0	0	0	0	0
	19-29	---	---	---	---	---	---	---
31:								
Peeler---------------	0-2	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	2-10	5.0-20	---	5.1-6.5	0	0	0	0
	10-22	10-25	---	5.6-7.3	0	0	0	0
	22-40	10-25	---	5.6-7.3	0	0	0	0
	40-62	5.0-15	---	6.1-7.3	0	0	0	0
32:								
Rock outcrop---------	0-60	---	---	---	---	---	---	---
Cathedral------------	0-9	5.0-20	---	5.6-7.3	0	0	0	0
	9-15	5.0-15	---	5.6-7.3	0	0	0	0
	15-60	---	---	---	---	---	---	---
33:								
Rock outcrop---------	0-60	---	---	---	---	---	---	---
Rubble land----------	0-60	---	---	---	---	---	---	---
34:								
Rock outcrop---------	0-60	---	---	---	---	---	---	---
Rubble land----------	0-60	---	---	---	---	---	---	---
Enentah--------------	0-6	5.0-15	---	5.1-6.0	0	0	0	0
	6-20	3.0-15	---	5.6-6.5	0	0	0	0
	20-34	3.0-15	---	5.6-6.5	0	0	0	0
	34-56	3.0-10	---	5.6-6.5	0	0	0	0
	56-72	2.0-10	---	5.6-6.5	0	0	0	0

Table 18.--Chemical soil properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
35:								
Rofork---------------	0-5	10-20	---	6.1-7.3	0	0	0	0
	5-10	5.0-20	---	6.1-7.3	0	0	0	0
	10-14	2.0-10	---	6.1-7.3	0	0	0	0
	14-24	---	---	---	---	---	---	---
Chasmfalls-----------	0-4	10-20	---	5.6-7.3	0	0	0	0
	4-13	5.0-20	---	5.6-7.3	0	0	0	0
	13-19	5.0-20	---	6.1-7.3	0	0	0	0
	19-28	5.0-20	---	6.1-7.3	0	0	0	0
	28-38	---	---	---	---	---	---	---
36:								
Rofork---------------	0-5	10-20	---	6.1-7.3	0	0	0	0
	5-10	5.0-20	---	6.1-7.3	0	0	0	0
	10-14	2.0-10	---	6.1-7.3	0	0	0	0
	14-24	---	---	---	---	---	---	---
Isolation------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-6	5.0-15	---	6.1-7.3	0	0	0	0
	6-11	5.0-15	---	6.1-7.3	0	0	0	0
	11-24	3.0-10	---	6.1-7.3	0	0	0	0
	24-33	3.0-10	---	6.1-7.3	0	0	0	0
	33-39	0.0-5.0	---	6.1-7.3	0	0	0	0
	39-51	0.0-5.0	---	6.1-7.3	0	0	0	0
	51-72	1.0-5.0	---	6.1-7.3	0	0	0	0
37:								
Rubble land----------	0-60	---	---	---	---	---	---	---
38:								
Terric Cryofibrists--	0-19	50-150	---	4.5-5.5	0	0	0	0
	19-21	50-100	---	4.5-5.5	0	0	0	0
	21-32	10-20	---	4.5-5.5	0	0	0	0
	32-53	3.0-20	---	4.5-5.5	0	0	0	0
	53-60	0.0-15	---	4.5-6.0	0	0	0	0
39:								
Tileston-------------	0-3	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	3-7	4.0-15	---	4.5-5.0	0	0	0	0
	7-13	5.0-15	---	4.5-5.5	0	0	0	0
	13-28	4.0-20	---	4.5-5.5	0	0	0	0
	28-36	5.0-25	---	4.5-5.5	0	0	0	0
	36-64	2.0-12	---	4.5-5.5	0	0	0	0

Table 18.--Chemical soil properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
40:								
Tonahutu-------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-6	3.0-15	---	5.1-6.0	0	0	0	0
	6-21	2.0-20	---	5.1-6.5	0	0	0	0
	21-35	2.0-20	---	5.1-6.5	0	0	0	0
	35-45	3.0-20	---	5.6-6.5	0	0	0	0
	45-62	1.0-5.0	---	5.6-7.3	0	0	0	0
41:								
Tonahutu-------------	0-1	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	1-6	3.0-15	---	5.1-6.0	0	0	0	0
	6-21	2.0-20	---	5.1-6.5	0	0	0	0
	21-35	2.0-20	---	5.1-6.5	0	0	0	0
	35-45	3.0-20	---	5.6-6.5	0	0	0	0
	45-62	1.0-5.0	---	5.6-7.3	0	0	0	0
42:								
Trailridge-----------	0-6	5.0-25	---	4.5-5.5	0	0	0	0
	6-11	5.0-25	---	4.5-5.5	0	0	0	0
	11-19	4.0-15	---	4.5-6.0	0	0	0	0
	19-29	---	---	---	---	---	---	---
Archrock-------------	0-8	5.0-20	---	4.5-5.5	0	0	0	0
	8-18	4.0-15	---	4.5-6.0	0	0	0	0
	18-25	2.0-15	---	4.5-6.0	0	0	0	0
	25-35	---	---	---	---	---	---	---
43:								
Trailridge-----------	0-6	5.0-25	---	4.5-5.5	0	0	0	0
	6-11	5.0-25	---	4.5-5.5	0	0	0	0
	11-19	4.0-15	---	4.5-6.0	0	0	0	0
	19-29	---	---	---	---	---	---	---
Mummy----------------	0-10	10-20	---	4.5-5.5	0	0	0	0
	10-21	5.0-20	---	4.5-5.5	0	0	0	0
	21-63	3.0-18	---	4.5-6.0	0	0	0	0
44:								
Venable--------------	0-3	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	3-9	10-25	---	5.6-7.3	0	0	0	0
	9-14	10-25	---	5.6-7.3	0	0	0	0
	14-31	10-30	---	5.6-7.3	0	0	0	0
	31-43	1.0-10	---	5.6-7.3	0	0	0	0
	43-63	10-25	---	5.6-7.3	0	0	0	0

Table 18.--Chemical soil properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
45:								
Ypsilon--------------	0-6	50-90	30-60	5.1-6.0	0	0	0.0-2.0	0
	6-14	4.0-15	---	3.5-5.5	0	0	0	0
	14-19	3.0-15	---	3.5-5.0	0	0	0	0
	19-24	5.0-15	---	3.5-5.0	0	0	0	0
	24-35	5.0-15	---	3.5-5.0	0	0	0	0
	35-67	0.0-5.0	---	4.5-5.5	0	0	0	0
46:								
Water----------------	---	---	---	---	---	---	---	---

Table 19.--Source of gravel and sand

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
1:					
Archrock------------	50	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.12	Bottom layer	0.05
Fallriver-----------	35	Fair		Fair	
		Organic matter content	0.00	Organic matter content	0.00
		Thickest layer	0.00	Thickest layer	0.04
		Bottom layer	0.12	Bottom layer	0.06
2:					
Archrock------------	35	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.12	Bottom layer	0.05
Onahu---------------	25	Fair		Fair	
		Thickest layer	0.12	Bottom layer	0.02
		Bottom layer	0.12	Thickest layer	0.02
Rock outcrop--------	20	Not rated		Not rated	
3:					
Bullwark------------	50	Poor		Poor	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.00
Catamount-----------	40	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.06
4:					
Catamount-----------	90	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.05
5:					
Catamount-----------	45	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.05
Bullwark------------	30	Poor		Poor	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.00
Rock outcrop--------	15	Not rated		Not rated	
6:					
Enentah-------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 19.--Source of gravel and sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
7:					
Enentah-------------	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rubble land---------	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
8:					
Fallriver-----------	90	Fair		Fair	
		Organic matter content	0.00	Organic matter content	0.00
		Thickest layer	0.00	Thickest layer	0.04
		Bottom layer	0.12	Bottom layer	0.06
9:					
Fallriver, warm-----	90	Fair		Fair	
		Organic matter content	0.00	Organic matter content	0.00
		Thickest layer	0.00	Thickest layer	0.04
		Bottom layer	0.12	Bottom layer	0.06
10:					
Fallriver-----------	50	Fair		Fair	
		Organic matter content	0.00	Organic matter content	0.00
		Thickest layer	0.00	Thickest layer	0.04
		Bottom layer	0.12	Bottom layer	0.06
Hiamovi-------------	30	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.66	Bottom layer	0.04
11:					
Fallriver-----------	60	Fair		Fair	
		Organic matter content	0.00	Organic matter content	0.00
		Thickest layer	0.00	Thickest layer	0.04
		Bottom layer	0.12	Bottom layer	0.06
Rock outcrop--------	25	Not rated		Not rated	
12:					
Galuche-------------	55	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.12	Bottom layer	0.04
Rock outcrop--------	30	Not rated		Not rated	
13:					
Granile-------------	85	Fair		Poor	
		Thickest layer	0.12	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00
14:					
Hiamovi-------------	55	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.66	Bottom layer	0.04

Table 19.--Source of gravel and sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
14:					
Rock outcrop--------	30	Not rated		Not rated	
15:					
Hiamovi-------------	50	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.66	Bottom layer	0.04
Rock outcrop--------	30	Not rated		Not rated	
16:					
Isolation-----------	90	Poor		Fair	
		Bottom layer	0.00	Organic matter content	0.00
		Organic matter content	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.14
17:					
Kawuneeche----------	90	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.05
		Bottom layer	0.57	Bottom layer	0.57
18:					
Kawuneeche----------	90	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.12	Bottom layer	0.08
19:					
Kawuneeche, low precipitation------	90	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.12	Bottom layer	0.08
20:					
Kawuneeche----------	50	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.12	Bottom layer	0.08
Dystrocryepts-------	40	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.12	Bottom layer	0.04
21:					
Legault-------------	90	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Organic matter content	0.00	Organic matter content	0.00
		Bottom layer	0.31	Bottom layer	0.08
22:					
Lumpyridge----------	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.10
23:					
Lumpyridge----------	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.10

Table 19.--Source of gravel and sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
23:					
Rofork	25	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.50	Bottom layer	0.12
24:					
Mummy	85	Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
25:					
Mummy	85	Fair		Fair	
		Bottom layer	0.12	Thickest layer	0.03
		Thickest layer	0.12	Bottom layer	0.04
26:					
Nanita	85	Fair		Fair	
		Organic matter content	0.00	Organic matter content	0.00
		Bottom layer	0.49	Bottom layer	0.07
		Thickest layer	0.49	Thickest layer	0.07
27:					
Nanita	100	Poor		Poor	
		Organic matter content	0.00	Organic matter content	0.00
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
28:					
Nanita	90	Fair		Fair	
		Organic matter content	0.00	Organic matter content	0.00
		Thickest layer	0.49	Thickest layer	0.49
		Bottom layer	0.49	Bottom layer	0.49
29:					
Nanita	75	Poor		Poor	
		Organic matter content	0.00	Organic matter content	0.00
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
Rock outcrop	15	Not rated		Not rated	
30:					
Onahu	35	Fair		Fair	
		Thickest layer	0.12	Bottom layer	0.04
		Bottom layer	0.12	Thickest layer	0.04
Terric Cryofibrists	25	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.12	Bottom layer	0.04
Trailridge	20	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.50	Bottom layer	0.06

Table 19.--Source of gravel and sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
31:					
Peeler	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
32:					
Rock outcrop	45	Not rated		Not rated	
Cathedral	40	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.44	Bottom layer	0.02
33:					
Rock outcrop	40	Not rated		Not rated	
Rubble land	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
34:					
Rock outcrop	30	Not rated		Not rated	
Rubble land	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Enentah	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
35:					
Rofork	60	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.50	Bottom layer	0.12
Chasmfalls	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
36:					
Rofork	60	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.50	Bottom layer	0.12
Isolation	30	Poor		Fair	
		Bottom layer	0.00	Organic matter content	0.00
		Organic matter content	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.14
37:					
Rubble land	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
38:					
Terric Cryofibrists	90	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.12	Bottom layer	0.04

Table 19.--Source of gravel and sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
39:					
Tileston------------	85	Poor		Poor	
		Organic matter content	0.00	Thickest layer	0.00
		Bottom layer	0.00	Organic matter content	0.00
		Thickest layer	0.00	Bottom layer	0.00
40:					
Tonahutu------------	85	Fair		Fair	
		Bottom layer	0.12	Thickest layer	0.03
		Thickest layer	0.12	Bottom layer	0.10
41:					
Tonahutu------------	90	Fair		Fair	
		Thickest layer	0.12	Thickest layer	0.03
		Bottom layer	0.12	Bottom layer	0.10
42:					
Trailridge----------	40	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.50	Bottom layer	0.06
Archrock------------	35	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.12	Bottom layer	0.05
43:					
Trailridge----------	45	Not rated		Not rated	
Mummy---------------	40	Fair		Fair	
		Bottom layer	0.12	Thickest layer	0.03
		Thickest layer	0.12	Bottom layer	0.04
44:					
Venable-------------	90	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Organic matter content	0.00	Thickest layer	0.00
		Bottom layer	0.00	Organic matter content	0.00
45:					
Ypsilon-------------	90	Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
46:					
Water---------------	100	Not rated		Not rated	

Table 20.--Source of reclamation material, roadfill, and topsoil

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
1:							
Archrock	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.16	Slope	0.00	Rock fragments	0.00
		Too acid	0.50			Depth to bedrock	0.16
		Stone content	0.92			Too acid	0.98
Fallriver	35	Fair		Poor		Poor	
		Organic matter content low	0.12	Slope	0.00	Slope	0.00
		Droughty	0.31	Cobble content (rock fragments)	0.03	Hard to reclaim	0.00
		Stone content	0.31	Stone content	0.41	Rock fragments	0.00
		Too acid	0.50			Too acid	0.88
		Cobble content	0.97				
2:							
Archrock	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.16	Slope	0.00	Slope	0.00
		Too acid	0.50			Depth to bedrock	0.16
		Stone content	0.92			Too acid	0.98
Onahu	25	Fair		Poor		Poor	
		Droughty	0.20	Wetness depth	0.00	Hard to reclaim (rock fragments)	0.00
		Too acid	0.50	Depth to bedrock	0.16	Rock fragments	0.00
		Organic matter content low	0.50	Stone content	0.83	Slope	0.00
		Stone content	0.80	Slope	0.92	Wetness depth	0.00
						Too acid	0.88
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
3:							
Bullwark-----------	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.05	Slope	0.00	Rock fragments	0.00
		Organic matter content low	0.50			Depth to bedrock	0.05
		Too acid	0.74				
Catamount----------	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Organic matter content low	0.12			Depth to bedrock	0.00
		Too acid	0.61				
4:							
Catamount----------	90	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
		Organic matter content low	0.12			Slope	0.37
		Too acid	0.61				
5:							
Catamount----------	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Organic matter content low	0.12			Slope	0.00
		Too acid	0.61				
Bullwark-----------	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.05	Slope	0.00	Slope	0.00
		Organic matter content low	0.50			Depth to bedrock	0.05
		Too acid	0.74				
Rock outcrop--------	15	Not rated		Not rated		Not rated	

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
6:							
Enentah-------------	85	Poor		Poor		Poor	
		Stone content	0.00	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Droughty	0.00	Slope	0.00		
		Cobble content	0.04	Stone content	0.00	Rock fragments	0.00
		Organic matter content low	0.12			Slope	0.00
		Too acid	0.74				
7:							
Enentah-------------	70	Poor		Poor		Poor	
		Stone content	0.00	Slope	0.00	Slope	0.00
		Droughty	0.00	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Cobble content	0.04	Stone content	0.00		
		Organic matter content low	0.12			Rock fragments	0.00
		Too acid	0.74				
Rubble land---------	15	Not rated		Not rated		Not rated	
8:							
Fallriver-----------	90	Fair		Poor		Poor	
		Organic matter content low	0.12	Slope	0.00	Hard to reclaim (rock fragments)	0.00
				Cobble content	0.03		
		Droughty	0.31	Stone content	0.41	Rock fragments	0.00
		Stone content	0.31			Slope	0.00
		Too acid	0.50			Too acid	0.88
		Cobble content	0.97				
9:							
Fallriver, warm-----	90	Fair		Poor		Poor	
		Organic matter content low	0.12	Slope	0.00	Hard to reclaim (rock fragments)	0.00
				Cobble content	0.03		
		Droughty	0.31	Stone content	0.41	Rock fragments	0.00
		Stone content	0.31			Slope	0.00
		Too acid	0.50			Too acid	0.88
		Cobble content	0.97				

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
10:							
Fallriver	50	Fair		Poor		Poor	
		Organic matter content low	0.12	Slope	0.00	Hard to reclaim (rock fragments)	0.00
				Cobble content	0.03		
		Droughty	0.31	Stone content	0.41	Rock fragments	0.00
		Stone content	0.31			Slope	0.00
		Too acid	0.50			Too acid	0.88
		Cobble content	0.97				
Hiamovi	30	Not rated		Poor		Poor	
				Depth to bedrock	0.00	Slope	0.00
				Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.00
11:							
Fallriver	60	Fair		Poor		Poor	
		Organic matter content low	0.12	Slope	0.00	Slope	0.00
				Cobble content	0.03	Hard to reclaim (rock fragments)	0.00
		Droughty	0.31	Stone content	0.41		
		Stone content	0.31			Rock fragments	0.00
		Too acid	0.50			Too acid	0.88
		Cobble content	0.97				
Rock outcrop	25	Not rated		Not rated		Not rated	
12:							
Galuche	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Organic matter content low	0.50			Depth to bedrock	0.00
						Too acid	0.98
		Too acid	0.54				
Rock outcrop	30	Not rated		Not rated		Not rated	
13:							
Granile	85	Fair		Poor		Poor	
		Stone content	0.22	Slope	0.00	Slope	0.00
		Too acid	0.74	Stone content	0.25	Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.88			Rock fragments	0.00
		Droughty	0.97				

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
14:							
Hiamovi-------------	55	Not rated		Poor		Poor	
				Depth to bedrock	0.00	Rock fragments	0.00
				Slope	0.18	Depth to bedrock	0.00
						Slope	0.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
15:							
Hiamovi-------------	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Organic matter content low	0.12			Depth to bedrock	0.00
		Stone content	0.50				
		Too acid	0.74				
Rock outcrop--------	30	Not rated		Not rated		Not rated	
16:							
Isolation-----------	90	Poor		Fair		Poor	
		Organic matter content low	0.00	Stone content	0.07	Rock fragments	0.00
				Cobble content	0.39	Slope	0.00
		Droughty	0.10	Slope	0.50		
		Stone content	0.36				
		Too acid	0.74				
17:							
Kawuneeche----------	90	Poor		Fair		Poor	
		Organic matter content low	0.00	Wetness depth	0.06	Hard to reclaim (rock fragments)	0.00
		Droughty	0.05			Rock fragments	0.00
		Too sandy	0.16			Wetness depth	0.06
		Too acid	0.50			Too sandy	0.16
18:							
Kawuneeche----------	90	Fair		Poor		Poor	
		Too acid	0.50	Wetness depth	0.00	Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.50				
						Wetness depth	0.00
						Too acid	0.88

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
19:							
Kawuneeche, low precipitation------	90	Fair		Poor		Poor	
		Too acid	0.50	Wetness depth	0.00	Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.50			Wetness depth	0.00
						Too acid	0.88
20:							
Kawuneeche----------	50	Fair		Poor		Poor	
		Too acid	0.50	Wetness depth	0.00	Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.50			Wetness depth	0.00
						Too acid	0.88
Dystrocryepts-------	40	Fair		Not rated		Poor	
		Too acid	0.50			Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.50			Slope	0.84
		Stone content	0.88			Too acid	0.88
21:							
Legault-------------	90	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Organic matter content low	0.12			Depth to bedrock	0.00
		Too sandy	0.20			Too sandy	0.20
		Too acid	0.74				
22:							
Lumpyridge----------	90	Fair		Good		Poor	
		Organic matter content low	0.12			Hard to reclaim (rock fragments)	0.00
		Droughty	0.87			Rock fragments	0.00
23:							
Lumpyridge----------	60	Fair		Good		Poor	
		Organic matter content low	0.12			Hard to reclaim (rock fragments)	0.00
		Droughty	0.86			Rock fragments	0.00
						Slope	0.96

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
23:							
Rofork---------------	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
						Slope	0.84
24:							
Mummy----------------	85	Poor		Poor		Poor	
		Cobble content	0.00	Cobble content	0.00	Slope	0.00
		Droughty	0.01	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Stone content	0.18	Stone content	0.18	Rock fragments	0.00
		Too acid	0.50			Too acid	0.88
		Organic matter content low	0.50				
25:							
Mummy----------------	85	Fair		Fair		Poor	
		Too acid	0.50	Slope	0.18	Hard to reclaim (rock fragments)	0.00
		Stone content	0.56	Stone content	0.78	Rock fragments	0.00
		Droughty	0.77			Slope	0.00
		Organic matter content low	0.82			Too acid	0.98
26:							
Nanita---------------	85	Poor		Poor		Poor	
		Droughty	0.00	Slope	0.00	Slope	0.00
		Stone content	0.00	Stone content	0.01	Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.12	Cobble content	0.97	Rock fragments	0.00
		Too sandy	0.47			Too sandy	0.47
		Too acid	0.74				
27:							
Nanita---------------	100	Poor		Poor		Poor	
		Too sandy	0.00	Cobble content	0.00	Too sandy	0.00
		Droughty	0.00	Stone content	0.01	Hard to reclaim (rock fragments)	0.00
		Cobble content	0.00			Rock fragments	0.00
		Stone content	0.00				
		Organic matter content low	0.12				
		Too acid	0.74				

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
28:							
Nanita	90	Poor		Poor		Poor	
		Droughty	0.00	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.00	Stone content	0.04	Rock fragments	0.00
		Too sandy	0.00	Cobble content	0.99	Slope	0.00
		Stone content	0.01			Too sandy	0.00
		Too acid	0.74				
29:							
Nanita	75	Poor		Poor		Poor	
		Droughty	0.00	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Cobble content	0.02	Slope	0.00	Rock fragments	0.00
		Stone content	0.04	Stone content	0.12	Slope	0.00
		Organic matter content low	0.12			Too sandy	0.42
		Too sandy	0.42				
		Too acid	0.74				
Rock outcrop	15	Not rated		Not rated		Not rated	
30:							
Onahu	35	Fair		Poor		Poor	
		Droughty	0.20	Wetness depth	0.00	Hard to reclaim (rock fragments)	0.00
		Too acid	0.50	Depth to bedrock	0.16	Rock fragments	0.00
		Organic matter content low	0.50	Stone content	0.83	Wetness depth	0.00
		Stone content	0.80			Slope	0.04
						Too acid	0.88
Terric Cryofibrists	25	Fair		Not rated		Not rated	
		Too acid	0.32				
Trailridge	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Too acid	0.50	Stone content	0.96	Depth to bedrock	0.00
		Stone content	0.50			Too acid	0.88

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
31:							
Peeler	90	Fair		Fair		Poor	
		Organic matter content low	0.12	Slope	0.18	Slope	0.00
		Too acid	0.74	Shrink-swell	0.94	Hard to reclaim (rock fragments)	0.68
						Rock fragments	0.98
32:							
Rock outcrop	45	Not rated		Not rated		Not rated	
Cathedral	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
						Depth to bedrock	0.00
33:							
Rock outcrop	40	Not rated		Not rated		Not rated	
Rubble land	30	Not rated		Not rated		Not rated	
34:							
Rock outcrop	30	Not rated		Not rated		Not rated	
Rubble land	30	Not rated		Not rated		Not rated	
Enentah	25	Poor		Poor		Poor	
		Stone content	0.00	Slope	0.00	Slope	0.00
		Droughty	0.00	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Cobble content	0.04	Stone content	0.00	Rock fragments	0.00
		Organic matter content low	0.12				
		Too acid	0.74				
35:							
Rofork	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.50	Depth to bedrock	0.00
						Slope	0.00
Chasmfalls	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.32			Slope	0.00
						Depth to bedrock	0.32

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
36:							
Rofork	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.50	Depth to bedrock	0.00
						Slope	0.00
Isolation	30	Poor		Fair		Poor	
		Organic matter content low	0.00	Stone content	0.07	Rock fragments	0.00
				Cobble content	0.35	Slope	0.00
		Droughty	0.10	Slope	0.50		
		Stone content	0.36				
		Too acid	0.74				
37:							
Rubble land	95	Not rated		Not rated		Not rated	
38:							
Terric Cryofibrists	90	Fair		Not rated		Not rated	
		Too acid	0.32				
39:							
Tileston	85	Fair		Poor		Poor	
		Cobble content	0.02	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Droughty	0.02	Slope	0.00		
		Stone content	0.08	Stone content	0.21	Rock fragments	0.00
		Organic matter content low	0.12			Slope	0.00
						Too acid	0.88
		Too acid	0.50				
40:							
Tonahutu	85	Poor		Fair		Poor	
		Droughty	0.00	Slope	0.08	Slope	0.00
		Organic matter content low	0.12	Stone content	0.25	Hard to reclaim (rock fragments)	0.00
		Stone content	0.22			Rock fragments	0.00
		Too acid	0.68				

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
41:							
Tonahutu-----------	90	Poor		Poor		Poor	
		Droughty	0.00	Slope	0.00	Slope	0.00
		Organic matter content low	0.12	Stone content	0.25	Hard to reclaim (rock fragments)	0.00
		Stone content	0.22			Rock fragments	0.00
		Too acid	0.68				
42:							
Trailridge---------	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Too acid	0.50	Stone content	0.96	Slope	0.00
		Stone content	0.50			Too acid	0.88
Archrock-----------	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.16	Slope	0.00	Slope	0.00
		Too acid	0.50			Depth to bedrock	0.16
		Stone content	0.92			Too acid	0.98
43:							
Trailridge---------	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Rock fragments	0.00
		Too acid	0.50	Stone content	0.96	Depth to bedrock	0.00
		Stone content	0.50			Too acid	0.88
Mummy--------------	40	Fair		Poor		Poor	
		Too acid	0.50	Slope	0.00	Slope	0.00
		Stone content	0.56	Stone content	0.78	Hard to reclaim (rock fragments)	0.00
		Droughty	0.77			Rock fragments	0.00
		Organic matter content low	0.82			Too acid	0.98
44:							
Venable------------	90	Fair		Poor		Poor	
		Organic matter content low	0.50	Wetness depth	0.00	Hard to reclaim (rock fragments)	0.00
		Too acid	0.74			Wetness depth	0.00

Table 20.--Source of reclamation material, roadfill, and topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
45:							
Ypsilon	90	Poor		Poor		Poor	
		Stone content	0.00	Slope	0.00	Slope	0.00
		Cobble content	0.25	Stone content	0.00	Hard to reclaim (rock fragments)	0.00
		Droughty	0.30	Cobble content	0.07	Rock fragments	0.00
		Too acid	0.50			Too acid	0.32
46:							
Water	100	Not rated		Not rated		Not rated	

Table 21.--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				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In.	In.		In.	In.			
1:									
Archrock	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	Moderate	High	High
Fallriver	---	---	---	---	0	---	Moderate	Moderate	Moderate
2:									
Archrock	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	Moderate	High	High
Onahu	Bedrock (paralithic)	40-60	---	Weakly cemented	0	---	Moderate	High	High
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	None	---	---
3:									
Bullwark	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	Moderate	Moderate	Moderate
	Bedrock (lithic)	30-50	---	Indurated					
Catamount	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	Moderate	Moderate	Moderate
4:									
Catamount	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	Moderate	Moderate	Moderate
5:									
Catamount	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	Moderate	Moderate	Moderate
Bullwark	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	Moderate	Moderate	Moderate
	Bedrock (lithic)	30-50	---	Indurated					
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	---	---	---
6:									
Enentah	---	---	---	---	0	---	Moderate	Moderate	Low
7:									
Enentah	---	---	---	---	0	---	Moderate	Moderate	Low
Rubble land	---	---	---	---	---	---	---	---	---
8:									
Fallriver	---	---	---	---	0	---	Moderate	Moderate	Moderate
9:									
Fallriver, warm	---	---	---	---	0	---	Moderate	Moderate	Moderate
10:									
Fallriver	---	---	---	---	0	---	Moderate	Moderate	Moderate
Hiamovi	Bedrock (lithic)	10-20	---	Indurated	0	---	Moderate	Low	Low
11:									
Fallriver	---	---	---	---	0	---	Moderate	Moderate	Moderate
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	---	---	---
12:									
Galuche	Bedrock (lithic)	10-20	---	Indurated	0	---	Moderate	Moderate	Low
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	None	---	---

Table 21.--Soil features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In.	In.		In.	In.			
13:									
Granile	---	---	---	---	0	---	Moderate	Moderate	Moderate
14:									
Hiamovi	Bedrock (lithic)	10-20	---	Indurated	0	---	Moderate	Low	Low
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	---	---	---
15:									
Hiamovi	Bedrock (lithic)	10-20	---	Indurated	0	---	Moderate	Low	Low
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	---	---	---
16:									
Isolation	---	---	---	---	0	---	Moderate	Low	Low
17:									
Kawuneeche	---	---	---	---	0	---	Moderate	High	Moderate
18:									
Kawuneeche	---	---	---	---	0	---	Moderate	Moderate	Low
19:									
Kawuneeche, low precipitation	---	---	---	---	0	---	High	High	Moderate
20:									
Kawuneeche	---	---	---	---	0	---	Moderate	Moderate	Low
Dystrocryepts	---	---	---	---	0	---	Moderate	High	High
21:									
Legault	Bedrock (paralithic)	5-20	---	Weakly cemented	0	---	Low	Moderate	Low
22:									
Lumpyridge	---	---	---	---	0	---	Moderate	Moderate	Low
23:									
Lumpyridge	---	---	---	---	0	---	Moderate	Moderate	Low
Rofork	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	Moderate	Moderate	Low
24:									
Mummy	---	---	---	---	0	---	Moderate	High	High
25:									
Mummy	---	---	---	---	0	---	Moderate	High	High
26:									
Nanita	---	---	---	---	0	---	Low	Low	Low
27:									
Nanita	---	---	---	---	0	---	Low	Low	Low
28:									
Nanita	---	---	---	---	0	---	Low	Low	Low
29:									
Nanita	---	---	---	---	0	---	Low	Low	Low
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	---	---	---
30:									
Onahu	Bedrock (paralithic)	40-60	---	Weakly cemented	0	---	Moderate	High	High
Terric Cryofibrists	---	---	---	---	3-8	6-16	High	Moderate	Moderate
Trailridge	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	Moderate	High	High

Table 21.--Soil features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In.	In.		In.	In.			
31:									
Peeler	---	---	---	---	0	---	Moderate	Low	Low
32:									
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	None	---	---
Cathedral	Bedrock (lithic)	10-20	---	Indurated	0	---	Moderate	Low	Low
33:									
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	None	---	---
Rubble land	---	---	---	---	---	---	None	---	---
34:									
Rock outcrop	Bedrock (lithic)	0-0	---	Indurated	---	---	None	---	---
Rubble land	---	---	---	---	---	---	None	---	---
Enentah	---	---	---	---	0	---	Moderate	Moderate	Low
35:									
Rofork	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	Moderate	Moderate	Low
Chasmfalls	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	Moderate	Moderate	Low
36:									
Rofork	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	Moderate	Moderate	Low
Isolation	---	---	---	---	0	---	Moderate	Low	Low
37:									
Rubble land	---	---	---	---	---	---	None	---	---
38:									
Terric Cryofibrists	---	---	---	---	3-8	6-16	High	Moderate	Moderate
39:									
Tileston	---	---	---	---	0	---	Moderate	Moderate	Moderate
40:									
Tonahutu	---	---	---	---	0	---	Moderate	Moderate	Low
41:									
Tonahutu	---	---	---	---	0	---	Moderate	Moderate	Low
42:									
Trailridge	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	Moderate	High	High
Archrock	Bedrock (paralithic)	20-40	---	Weakly cemented	0	---	Moderate	High	High
43:									
Trailridge	Bedrock (paralithic)	10-20	---	Weakly cemented	0	---	Moderate	High	High
Mummy	---	---	---	---	0	---	Moderate	High	High
44:									
Venable	---	---	---	---	0	---	High	High	Moderate
45:									
Ypsilon	---	---	---	---	0	---	Moderate	Moderate	Moderate
46:									
Water	---	---	---	---	---	---	---	---	---

Table 22.--Water features

(Depths of layers are in feet. See text for definitions of terms used in this table.Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft.	Ft.	Ft.				
1:										
Archrock	C	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Fallriver	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
2:										
Archrock	C	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Onahu	C	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	0.5-1.5	3.3-5.0	---	---	None	---	None
			July	0.5-1.5	3.3-5.0	---	---	None	---	None
			August	0.5-1.5	3.3-5.0	---	---	None	---	None
			September	0.8-2.0	3.3-5.0	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Rock outcrop	D	Very high	Jan-Dec	---	---	---	---	None	---	---

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft.	Ft.	Ft.				
3:										
Bullwark------------------	C	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Catamount-----------------	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
4:										
Catamount-----------------	D	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
5:										
Catamount-----------------	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Bullwark------------------	C	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
5:										
Rock outcrop	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
6:										
Enentah	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
7:										
Enentah	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Rubble land	A	Low	Jan-Dec	---	---	---	---	None	---	---
8:										
Fallriver	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
9:										
Fallriver, warm	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
10:										
Fallriver-----------------	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Hiamovi-------------------	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
11:										
Fallriver-----------------	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Rock outcrop--------------	D	Very high	Jan-Dec	---	---	---	---	None	---	---
12:										
Galuche-------------------	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Rock outcrop--------------	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
13:										
Granile	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
14:										
Hiamovi	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Rock outcrop	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
15:										
Hiamovi	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Rock outcrop	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
16:										
Isolation	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
17:										
Kawuneeche	C	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	1.0-1.5	>6.0	---	---	None	Brief	Occasional
			June	1.0-1.5	>6.0	---	---	None	Brief	Occasional
			July	1.0-1.5	>6.0	---	---	None	Brief	Occasional
			August	1.5-2.5	>6.0	---	---	None	---	None
			September	2.0-3.0	>6.0	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
18:										
Kawuneeche	D	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	0.8-2.0	>6.0	---	---	None	---	None
			May	0.5-1.5	>6.0	---	---	None	Brief	Frequent
			June	0.0-1.5	>6.0	---	---	None	Brief	Frequent
			July	0.0-1.5	>6.0	---	---	None	Brief	Frequent
			August	0.0-1.5	>6.0	---	---	None	---	None
			September	0.8-2.0	>6.0	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
19:										
Kawuneeche, low precipitation	D	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	0.5-2.0	>6.0	---	---	None	---	None
			May	0.5-2.0	>6.0	---	---	None	Brief	Frequent
			June	0.0-1.5	>6.0	---	---	None	Brief	Frequent
			July	0.0-1.5	>6.0	---	---	None	Brief	Frequent
			August	0.0-1.5	>6.0	---	---	None	---	None
			September	0.8-2.0	>6.0	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
20:										
Kawuneeche	D	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	0.8-2.0	>6.0	---	---	None	---	None
			May	0.6-1.5	>6.0	---	---	None	Brief	Occasional
			June	0.0-1.5	>6.0	---	---	None	Brief	Frequent
			July	0.0-1.5	>6.0	---	---	None	Brief	Occasional
			August	0.0-1.5	>6.0	---	---	None	---	None
			September	2.0-3.0	>6.0	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
20:										
Dystrocryepts	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	2.0-5.0	>6.0	---	---	None	---	None
			June	2.0-5.0	>6.0	---	---	None	Very brief	Rare
			July	2.0-5.0	>6.0	---	---	None	Very brief	Rare
			August	2.0-5.0	>6.0	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
21:										
Legault	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
22:										
Lumpyridge	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
23:										
Lumpyridge	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Rofork	D	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
24:										
Mummy	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
25:										
Mummy	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
26:										
Nanita	A	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
27:										
Nanita	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
28:										
Nanita	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
29:										
Nanita--------------------	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Rock outcrop--------------	D	Very high	Jan-Dec	---	---	---	---	None	---	---
30:										
Onahu---------------------	C	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	0.5-1.5	3.3-5.0	---	---	None	---	None
			June	0.5-1.5	3.3-5.0	---	---	None	---	None
			July	0.5-1.5	3.3-5.0	---	---	None	---	None
			August	0.5-1.5	3.3-5.0	---	---	None	---	None
			September	0.8-2.0	3.3-5.0	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Terric Cryofibrists-------	D	Negligible	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	0.0-1.5	>6.0	---	---	None	---	None
			May	0.0-1.5	>6.0	0.0-0.5	Brief	Occasional	---	None
			June	0.0-1.5	>6.0	0.2-1.0	Long	Occasional	---	None
			July	0.0-1.5	>6.0	0.0-0.5	Brief	Occasional	---	None
			August	0.0-1.5	>6.0	---	---	None	---	None
			September	0.0-1.5	>6.0	---	---	None	---	None
			October	0.0-1.5	>6.0	---	---	None	---	None
			November	0.0-1.5	>6.0	---	---	None	---	None
			December	---	---	---	---	None	---	None
Trailridge----------------	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
31:										
Peeler--------------------	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
32:										
Rock outcrop	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Cathedral	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
33:										
Rock outcrop	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Rubble land	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
34:										
Rock outcrop	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
34:										
Rubble land	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Enentah	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
35:										
Rofork	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Chasmfalls	C	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
36:										
Rofork	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
36:										
Isolation	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
37:										
Rubble land	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
38:										
Terric Cryofibrists	D	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	0.0-1.5	>6.0	---	---	None	---	None
			May	0.0-1.5	>6.0	---	---	None	Brief	Frequent
			June	0.0-1.5	>6.0	---	---	None	Long	Frequent
			July	0.0-1.5	>6.0	---	---	None	Brief	Frequent
			August	0.0-1.5	>6.0	---	---	None	---	None
			September	0.0-1.5	>6.0	---	---	None	---	None
			October	0.0-1.5	>6.0	---	---	None	---	None
			November	0.0-1.5	>6.0	---	---	None	---	None
			December	---	---	---	---	None	---	None
39:										
Tileston	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
40:										
Tonahutu	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
41:										
Tonahutu	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
42:										
Trailridge	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Archrock	C	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
43:										
Trailridge	D	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Mummy	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Table 22.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Surface runoff	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
				Ft.	Ft.	Ft.				
44:										
Venable	D	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	0.0-3.0	>6.0	---	---	None	---	None
			May	0.0-2.0	>6.0	---	---	None	Brief	Occasional
			June	0.0-2.0	>6.0	---	---	None	Brief	Occasional
			July	0.0-2.0	>6.0	---	---	None	Brief	Occasional
			August	0.0-2.0	>6.0	---	---	None	---	None
			September	0.0-3.0	>6.0	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
45:										
Ypsilon	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
46:										
Water	---	---	Jan-Dec	---	---	---	---	None	---	---

Table 23.--Taxonomic classification of the soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Archrock	Loamy-skeletal, paramicaceous Humic Dystrocryepts
Bullwark	Loamy-skeletal, paramicaceous Lamellic Eutrocryepts
Catamount	Loamy-skeletal, paramicaceous, shallow Ustic Dystrocryepts
Cathedral	Loamy-skeletal, paramicaceous, frigid Lithic Haplustolls
Chasmfalls	Coarse-loamy, paramicaceous, frigid Pachic Haplustolls
Dystrocryepts	Dystrocryepts
Enentah	Loamy-skeletal, mixed, superactive Typic Eutrocryepts
Fallriver	Loamy-skeletal, isotic Typic Dystrocryepts
Galuche	Loamy-skeletal, paramicaceous, frigid Lithic Dystrustepts
Granile	Loamy-skeletal, mixed, superactive Ustic Glossocryalfs
Hiamovi	Loamy-skeletal, paramicaceous Lithic Dystrocryepts
Isolation	Loamy-skeletal, mixed, superactive, frigid Alfic Argiustolls
Kawuneeche	Coarse-loamy, mixed, superactive, nonacid Fluvaquentic Cryaquepts
Legault	Sandy-skeletal, paramicaceous, shallow Typic Cryorthents
Lumpyridge	Fine-loamy, paramicaceous, frigid Typic Argiustolls
Mummy	Loamy-skeletal, paramicaceous Humic Dystrocryepts
Nanita	Sandy-skeletal, mixed Lamellic Cryorthents
Onahu	Loamy-skeletal, paramicaceous, acid Aeric Humic Cryaquepts
*Peeler	Fine-loamy, mixed, superactive Ustic Glossocryalfs
Rofork	Loamy-skeletal, paramicaceous, frigid, shallow Entic Haplustolls
Terric Cryofibrists	Terric Cryofibrists
Tileston	Loamy-skeletal, isotic Typic Glossocryalfs
Tonahutu	Loamy-skeletal, mixed, superactive Lamellic Haplocryalfs
Trailridge	Loamy-skeletal, paramicaceous, shallow Humic Dystrocryepts
*Venable	Fine-loamy, mixed, superactive Cumulic Cryaquolls
Ypsilon	Loamy-skeletal, isotic Typic Haplocryods

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