How To Use This Soil Survey

General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, 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 follow the general soil map. These 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, which precedes the soil maps. 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 Index to Map Units (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.

The Summary of Tables shows which table has data on a specific land use for each detailed soil map unit. See 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 Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1982. Soil names and descriptions were approved in 1986. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1982. This survey was made cooperatively by the Soil Conservation Service; the United States Department of the Interior, Bureau of Land Management; and the University of Nevada Agricultural Experiment Station. It is part of the technical assistance furnished to the Big Meadow Conservation District.

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

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: A typical landform sequence in the southern part of Grass Valley facing the west slope of the Tobin Range. Dun Glen soils are on fan skirts in the foreground. Adelaide, Orovada, and Snapp are the dominant soils on the fan piedmont remnant in the middle of the picture. Reluctan, Roca, and Wiskan are the dominant soils on the hills in the background on the right, and Layview and Tusel are the dominant soils on the far mountains.
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<tr>
<td>1291</td>
<td>Slaven-Iver-Cleavage association</td>
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</tr>
<tr>
<td>1292</td>
<td>Slaven-Iver-Rock outcrop association</td>
<td>267</td>
</tr>
<tr>
<td>1320</td>
<td>Aylan-Chen-Rock outcrop association</td>
<td>269</td>
</tr>
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<td>1321</td>
<td>Aylan-Slaven association</td>
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<td>1340</td>
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<tr>
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<tr>
<td>1360</td>
<td>Kram-Hopeka-Rock outcrop association</td>
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<td>1390</td>
<td>Mulhop-Xine-Rock outcrop association</td>
<td>278</td>
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<tr>
<td>1410</td>
<td>Yobe-Bezo-Yobe, occasionally flooded, association</td>
<td>280</td>
</tr>
<tr>
<td>1411</td>
<td>Yobe-Sonoma association</td>
<td>282</td>
</tr>
<tr>
<td>1412</td>
<td>Yobe silt loam, occasionally flooded</td>
<td>284</td>
</tr>
<tr>
<td>1420</td>
<td>Goldrun Variant sandy loam, 4 to 15 percent slopes</td>
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</tr>
<tr>
<td>1430</td>
<td>Yobe Variant silty clay</td>
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<td>Alley-Snowmore-Rock outcrop association</td>
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<td>1480</td>
<td>Tusel-Layview-Rock outcrop association</td>
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<td>1490</td>
<td>Xine-Mulhop-Puffer association</td>
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<tr>
<td>1500</td>
<td>Cortez very fine sandy loam, 2 to 8 percent slopes</td>
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</tr>
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<td>1501</td>
<td>Cortez-Tenabo-Beoska association</td>
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<td>Locane-Rock outcrop association</td>
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<td>1530</td>
<td>Polum-Dekoom-Polun Variant association</td>
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<td>1551</td>
<td>Eastwell, moderately steep-Shabliss-Eastwell association</td>
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<td>1560</td>
<td>Denay-Wereld-Xine association</td>
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<tr>
<td>1570</td>
<td>Pocker Variant loam, wet</td>
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<td>Isole-Parran-Appian association</td>
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<td>Biddleman-Trochen-Biddleman, stony, association</td>
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<td>Jobpeak-Teguro-Rock outcrop association</td>
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<td>Bedwyr-Bedzee-Jobpeak association</td>
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<td>3020</td>
<td>Uripes-Rock outcrop association</td>
<td>321</td>
</tr>
<tr>
<td>3030</td>
<td>Singatse, very steep-Rock outcrop-Singatse association</td>
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<tr>
<td>3031</td>
<td>Singatse-Jobpeak-Rock outcrop association</td>
<td>324</td>
</tr>
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<td>3040</td>
<td>Madeline-Millerlux association</td>
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<tr>
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<td>Millerlux-Ninemile-Madeline association</td>
<td>328</td>
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</table>
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Foreword

This soil survey contains information that can be used in land-planning programs in the survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome 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 suitability 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 insure 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.

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 Soil Conservation Service or the Cooperative Extension Service.

William D. Goddard
State Conservationist
Soil Conservation Service
Soil Survey of Pershing County, Nevada, East Part

By Michael J. Zielinski, United States Department of the Interior, Bureau of Land Management


United States Department of Agriculture, Soil Conservation Service, in cooperation with
United States Department of the Interior, Bureau of Land Management, and University of Nevada Agricultural Experiment Station

This survey area is in the north-central part of Nevada (fig. 1). It is bounded on the north by Humboldt County, on the east by Lander County, on the south by Churchill County, and on the west by the western part of Pershing County. It has a total of 1,965,973 acres, or 3,072 square miles. Lovelock and Winnemucca are near the survey area but are outside of it.

The survey area consists of numerous north-south oriented mountain ranges and valleys. Elevations average 8,500 feet in the mountains and 4,300 feet in the valleys.

All of the public land in the survey area is administered by the Bureau of Land Management.

General Nature of the Survey Area

This section gives general information about the survey area. It describes history, water supply, industries and transportation facilities, drainage, geology, and climate.

History

The earliest inhabitants of the survey area are estimated to have arrived about 10,000 to 12,000 years ago. During the relatively dry climatic period between 7,000 and 4,500 years ago, the area was either

Figure 1.—Location of Pershing County, east part, in Nevada.
sparsely populated or abandoned. General reinstallation began about 4,500 years ago.

In 1828, when fur traders arrived, the Northern Paiute Indians occupied the area. The first immigrants settled in 1841, following the Humboldt River west from its source. Trains of immigrants continued crossing the northern edge of the area until the 1870's.

During the period of immigration, traders established themselves along the Humboldt River. Large-scale settlement began in the early 1860's, after silver ore was discovered in the Humboldt and East Ranges.

Ranching and agriculture developed in the period 1860-70. Large livestock operations were established in the area by the late 1870's. Agriculture, both livestock and crop production, still is important in diversifying the economy.

**Water Supply**

The major source of irrigation water in the survey area is the Humboldt River. A few wells have been drilled, but they furnish only a small part of the total water supply. At the higher elevations, numerous small springs and seeps and several small perennial streams provide water for livestock and wildlife. Wells and streamflow provide water in the valleys, where there are few springs and the streams generally are intermittent. The ground water in the valleys varies in quality, and the amount available for irrigation has not been determined. Wells or dependable springs provide water for domestic uses in rural areas.

**Industries and Transportation Facilities**

The main industries in the survey area are ranching and mining. The ranches are dominantly cow-calf enterprises, and the current year's calves are generally sold in fall. A few herds of sheep graze in the area in summer.

The survey area has been mined since the mid-1800's. It has the State's largest tungsten, antimony, and iron mines as well as economically significant mercury, gold, silver, lead, and copper mines. The Eugene Mountains have one of the largest known tungsten deposits in North America.

Geothermal steam reservoirs capable of generating commercial electricity have been discovered in the northern part of Dixie Valley and northeast of Rye Patch Reservoir.

Ongoing explorations are taking place in the survey area for such mineral resources as gold, silver, copper, and barite and for oil, gas, and geothermal steam.

The survey area is sparsely inhabited and thus has few improved roads. Most of the area is accessible by dirt roads or jeep trails. Interstate 80 runs in an east-west direction along the northern edge of the survey area. State Highway 50 runs south in Buena Vista Valley from Interstate 80 to Unionville.

The survey area is served by two railroads, which parallel the Humboldt River. Most of the minerals mined in the area are shipped by rail.

**Drainage**

Most valleys, or bolsons, in the survey area are internally drained. Surface drainage is restricted in the valleys by the bounding mountains and by the lower hills or alluvial divides on the other two sides. The bolson floor in this type of drainage basin is ephemerally flooded. Buena Vista playa is the most prominent example of a bolson floor in the survey area. The Humboldt River drains the western and northern parts of the survey area. It flows in a southwest direction in the northwestern part of the survey area.

**Geology**

The diverse geology of the survey area ranges in age from Cambrian to Holocene (10). The rock types include intrusive and extrusive igneous rocks; sedimentary rocks of biologic, clastic, and chemical origin; and various low- and high-grade metamorphic rocks. Three major pre-Cenozoic episodes of folding and thrust faulting have structurally mixed the rock units in many areas (10). Cenozoic volcanism and later large-scale vertical faulting have obscured many of the older features. They have contributed to the present basin and range topography. Basin alluvial deposits are among the most extensive features in the survey area.

Most bolsons contain alluvial fill several thousand feet thick. The uppermost sequence of sediments consists of Quaternary alluvial deposits on the mountain flanks and lake deposits on the valley floors (10). It is made up of a wide variety of materials occurring both as mixtures and as distinct, fairly homogeneous bodies. The lithology of the bounding mountains helps to determine the composition of the valley fill material and of the soils that subsequently form in the basins.

Lake sediments on the valley floors are typically fine textured deposits of Pleistocene age (10). Many of these deposits, such as those in the Buena Vista Valley and the Humboldt River Valley, formed during the time of Lake Lahontan, the largest Pleistocene pluvial lake in the Great Basin. The major mountain ranges in the survey area are the East, Tobin, and Humboldt Ranges.

Sandstone, chert, limestone, dolomite, siltstone, and conglomerate make up most of the sedimentary Paleozoic and Mesozoic rock units within the East Range (10). The relationship between these rock units has been greatly complicated by three episodes of
extensive thrust faults. Two of these occurred in the Paleozoic era and one occurred in the middle Mesozoic era. Granite Mountain, at the south end of the range, is made up of two intrusive complexes. One of these is Triassic leucogranite, which makes up the south half of the mountain. The other is Tertiary granodiorite, which forms the northern part (10). Quaternary basalt covers some of the upland parts of the range. High-angle vertical faults cut most of the rock units.

The Tobin Range consists mainly of late Paleozoic and early Mesozoic sedimentary rocks (10). The Paleozoic rocks belong to the Havallah and Pumpernickel Formations. They consist of limestone, dolomite, and quartzite that have been completely folded and faulted. The early Mesozoic rock assemblages are similar to the Paleozoic rocks, but they include a significant amount of metavolcanic rock types. A thick sequence of rhyolite and andesite is in the lower third of the range. Quaternary basalt flows are around the southern margins of the range (10). High-angle normal faults have resulted in a steep, abrupt relief in the Tobin Range.

The Humboldt Range is made up predominantly of complexly folded and faulted Triassic rock units (10). The older units occur as a mixed assemblage of rhyolite and tuffaceous sediments. Two younger units occur as a sequence of limestone, dolomite, sandstone, and siltstone. All of the units have been folded and overturned during thrust faulting and have intrusions of rhyolite and leucogranite. Rocky Canyon granodiorite of Cretaceous age is a more recent intrusive feature. Quaternary basalt crops out at both the north and south ends of the range (10).

Climate

In this survey area, summers are hot, especially at the lower elevations, and winters are cold. Precipitation is normally light at the lower elevations during all months of the year. At the higher elevations, precipitation is much heavier and snow accumulates to considerable depths. Much of the snowmelt irrigates crops in the nearby valleys.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Lovelock, Nevada, in the period 1951-80. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperatures at Imlay, Lovelock, and Winnemucca are 34, 35, and 32 degrees F, respectively. The average daily minimum temperature is 21 degrees at Imlay, 22 degrees at Lovelock, and 19 degrees at Winnemucca. The lowest temperature, which occurred at Winnemucca on December 9, 1972, is -34 degrees. In summer the average temperature is 72 degrees at Imlay and Lovelock and 68 degrees at Winnemucca. The average daily maximum temperature is about 89. The highest recorded temperature, which occurred at Imlay on July 17, 1959, is 112 degrees.

Growing degree days are shown in table 1. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 7 inches at Imlay, 5 inches at Lovelock, and 8 inches at Winnemucca. Of this, 45 percent usually falls in April through September. The growing season for most crops falls within this period. The heaviest one-day rainfall during the period of record was 1.58 inches at Winnemucca on October 24, 1951. Thunderstorms occur on about 14 days each year.

The average seasonal snowfall is about 7 inches at Imlay, 3 inches at Lovelock, and 25 inches at Winnemucca. The greatest snow depth at any one time during the period of record was 10 inches at Winnemucca. On an average of 1 day at Imlay and Lovelock and 13 days at Winnemucca, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year. Every few years a blizzard strikes the survey area. Even at the lower elevations, snow remains on the ground for many weeks.

The average relative humidity in midafternoon is about 35 percent. Humidity is higher at night, and the average at dawn is about 65 percent. The sun shines 80 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the west. Average windspeed is highest, 9 miles per hour, in spring.

Soil Landscapes

The mapped areas in this soil survey generally represent associations of two or three soil components and other included soils of limited extent. Soil patterns commonly coincide with landforms and physiographic positions. In the section “Detailed Soil Map Units,” descriptive terms are used to identify where the individual soil components occur on the landscape. Landforms and soils are related, but they are not mutually exclusive. Individual soil series commonly occur on more than one component landform.

In this survey area the landforms are classified and defined in a manner precise enough to show where the
### Chart 1.—Classification of Bolson Landforms

<table>
<thead>
<tr>
<th>Major physiographic part</th>
<th>Major landform</th>
<th>Component landform</th>
<th>Landform element</th>
<th>Slope component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bounding mountains</td>
<td>Mountain valley fan</td>
<td>Erosional fan remnant</td>
<td>Summit</td>
<td>Shoulder slope</td>
</tr>
<tr>
<td>Piedmont slope</td>
<td></td>
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<td>Side slope</td>
<td>Back slope</td>
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<td></td>
<td>Partial ballena</td>
<td>Crest</td>
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<td>Shoulder slope</td>
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<td>Inset fan</td>
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<td>Foot slope</td>
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<td></td>
<td>Fan collar</td>
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<td>Erosional fan remnant</td>
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<td>Inset fan</td>
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<td>Fan apron</td>
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<tr>
<td>Fan skirt</td>
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<td>Beach terrace</td>
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<td>Basin floor</td>
<td>Alluvial flat</td>
<td>Relict alluvial flat</td>
<td>Channel</td>
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<tr>
<td>(bolson floor)</td>
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<td>Recent alluvial flat</td>
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<td>Lake plain</td>
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<td>Lake plain terrace</td>
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<td></td>
<td></td>
<td>Floodplain playa</td>
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</table>

Soils occur in relation to each other (16). This section does not define all of the landform terms, but it briefly defines the main geomorphic surfaces in the survey area. All landform terms are defined in the “Glossary.”

The landforms of the intermontane basins are first grouped in two general classes—bolson (fig. 2) and semibolson (fig. 3). Within these two groups, three major physiographic parts are identified (fig. 4). These are the bounding mountains, the piedmont slope, and the basin floor. The bounding mountains rise more than 1,000 feet above the surrounding boundaries. They differ from hills, which are defined as highland masses that rise less than 1,000 feet above the surrounding boundaries. The piedmont slope and basin floor are topographic forms that extend from the bounding mountains down to a central playa.
### Chart 2.—Classification of Semibolson Landforms

<table>
<thead>
<tr>
<th>Major physiographic part</th>
<th>Major landform</th>
<th>Component landform</th>
<th>Landform element</th>
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<td>Side slope</td>
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<td>Partial ballena</td>
<td>Crest</td>
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<td>Shoulder slope</td>
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<td>Inset fan</td>
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<td>Ballena</td>
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<td>Crest</td>
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<td></td>
<td>Inset fan</td>
<td>Fan collar</td>
<td>Channel</td>
<td>Shoulder slope</td>
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<td>Erosional fan remnant</td>
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<td>Fan apron</td>
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<td></td>
<td></td>
<td>Nonburied fan remnant</td>
<td>Channel</td>
<td>Foot slope</td>
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<tr>
<td>Basin floor (semibolson floor)</td>
<td>Alluvial fan</td>
<td>Relict alluvial flat</td>
<td>Channel</td>
<td>Shoulder slope</td>
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<td>Back slope</td>
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<td>Basin-floor remnant</td>
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<td>Foot slope</td>
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<td>Side slope</td>
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<td></td>
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<td>Shoulder slope</td>
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The shapes, genetic relationships, and geographic scales of the topography seen in the field are used to classify the landforms. The two general classes—bolson and semibolson—are successively divided into smaller and genetically more homogeneous classes (charts 1 and 2). The broadest class is major physiographic parts, each of which is made up of several genetically related major landforms. These landforms in turn may
Figure 2.—The major physiographic parts of an internally drained intermontane basin, or bolson: the piedmont slope (P), and the basin floor, or, more specifically, the bolson floor (F). This drawing shows part of an elongated bolson that has bounding mountain ranges on the near and far sides and is cut off by hills on the far end. The drainageways, shown by dotted lines, suggest positions of major landforms. Neither the playas nor the drainageways on the floor are shown.

consist of several genetically related component landforms. The component landforms are the smallest single units considered in combined terms of their form, constituent materials, and genetic history. Some component landforms, such as fan piedmont remnants, have distinctive topographic parts with quite different geomorphic histories. These parts are called landform elements. The landform elements that are erosional surfaces are subdivided into slope components.

In the section "General Soil Map Units," landscape positions are given for each of the major components. These generally are major physiographic parts, major landforms, or component landforms. In the section "Detailed Soil Map Units," broad landscape positions are given for each map unit in the description of map unit setting. These are major physiographic parts or major landforms. More detailed landscape positions also are given for each major component and contrasting inclusion in the map unit. These generally are component landforms, landform elements, or slope components.

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 unmodified parent material in which the soil formed. The unmodified material is devoid of roots
and most 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 or miscellaneous area is associated with a particular kind or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, 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.

Individual soils on the landscape commonly merge into one another as their characteristics gradually change. To construct an accurate 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 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

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Figure 3.—A semibolson that displays the effects of several cycles of dissection and deposition. The major landforms are a ballena (B); fan pediments (P), comprising several levels, or ages, of fan remnants; fan skirts (S); an axial stream terrace (T); and an axial stream flood plain (F). Alluvial fans are not distinguished from fan pediments. Component landforms of inset fans (I) are between fan remnants. The basin is bounded on two sides by mountains (M).
taxonomic classes. 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.

Some of the typical pedons of the soils in this survey area are located in the eastern part of Humboldt County because a large part of Pershing County was mapped in an older survey of the Sonoma area, which included parts of Humboldt and Pershing Counties (22). For the soils that were already mapped in the older survey and were not mapped again in the current survey, the description of the typical pedon already available has been used regardless of the survey area in which the pedon occurred. The series description of these soils includes a statement indicating that the pedon is in Humboldt County. In some pedons taxa are in map units that are similar to but are not exactly the same as units in this survey area.

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

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

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

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas, especially where this survey area joins the Lovelock area. Differences are the result of a better knowledge of soils, an improved methodology of mapping, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas. These differences do not significantly affect the use of this survey.
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 soils or miscellaneous areas making up one 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 or miscellaneous areas can be identified on the map. Likewise, areas that 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.

Figures 5 and 6 show how the general soil map units relate to the various broad landscapes. The map units in figure 5 are representative of those on a bolson that is an internally drained intermontane basin. The map units in figure 6 are representative of those on a semibolson that is an externally drained intermontane basin.

The general map units in this survey have been grouped for broad interpretative purposes. Each of the broad groups and the map units in each group are described on the following pages.

Map Unit Descriptions

Areas Dominated by Soils on Bolson and Semibolson Floors

This group consists of five map units. The soils in this group are dominantly on alluvial flats, flood plains, lake plains, lake plain terraces, and sand sheets (16). Elevations are 3,800 to 4,600 feet. The average annual precipitation is 4 to 8 inches, the average annual temperature is 48 to 52 degrees F, and the frost-free period is about 100 to 130 days.

1. Playas

This map unit is on level bolson floors in the sink areas of Buena Vista and Buffalo Valleys. The areas are barren of vegetation. In most years water is ponded in these areas following spring runoff.

This map unit makes up about 2.5 percent of the survey area.

This map unit consists of nearly impermeable lacustrine sediments that are veneered with fine textured sediment and sandy eolian material.

This map unit is not suited to most uses.

2. Wendane-Sondoa-Preble

Nearly level, very deep, somewhat poorly drained and well drained soils on lake plains, lake plain terraces, and alluvial flats

This map unit is in the Buena Vista, Buffalo, and Dixie Valleys. The vegetation is mainly big saltbush and black greasewood on Wendane soils, shadscale and black greasewood on Swingler soils, and black greasewood on Preble soils.

This map unit makes up about 6 percent of the survey area.

Wendane soils are somewhat poorly drained and are on lake plains. They have a thin, light colored, medium textured surface layer and a medium textured and moderately fine textured subsoil. They are strongly salt and sodium affected. They are occasionally flooded.

Sondoa soils are well drained and are on lake plain terraces. They have a light colored surface layer and are medium textured throughout. They are moderately salt and sodium affected. They are not subject to flooding.

Preble soils are somewhat poorly drained and are on alluvial flats. They have a thin, light colored, medium textured surface layer, which is underlain by moderately fine textured material. They are strongly salt and sodium affected. They are not subject to flooding.

Of minor extent in this map unit are nearly level, small playas in concave areas. These areas have a crusted surface layer. They are strongly salt and sodium affected and do not support vegetation.
This map unit is used for livestock grazing and wildlife habitat. The main limitations are the low average annual precipitation and the salt- and sodium-affected soil profiles.

3. Mazuma-Swingler-Bluewing

Nearly level to moderately sloping, very deep, somewhat excessively drained to moderately well drained soils on lake plain terraces, lake plains, and beach terraces.

This map unit is in the Buena Vista, Lovelock, and Jersey Valleys. The vegetation is mainly shadscale in moderately salt- and sodium-affected areas of Mazuma soils, black greasewood and seepweed in strongly salt- and sodium-affected areas of Mazuma soils, black greasewood and shadscale on Swingler soils, and shadscale and bud sagebrush on Bluewing soils.

This map unit makes up about 13 percent of the survey area.

Mazuma soils are well drained and are on nearly level lake plain terraces. They have a thin, light colored, medium textured surface layer, which is underlain by gravelly, medium textured to coarse textured material. They are moderately and strongly salt and sodium affected.

Swingler soils are moderately well drained and are on nearly level lake plains. They have a light colored surface layer and are medium textured throughout. They are strongly salt and sodium affected.

Bluewing soils are somewhat excessively drained and are on nearly level to moderately sloping beach terraces. They have a thin, light colored, very gravelly, moderately coarse textured or medium textured surface layer and a very gravelly, coarse textured subsoil.

Of minor extent in this map unit are Yobe and Islolde soils. Yobe soils are somewhat poorly drained and are on nearly level lake plains. Islolde soils are excessively drained and are on moderately sloping sand dunes. Yobe soils support big saltbush, and Islolde soils support fourwing saltbush and Indian ricegrass.

Figure 5.—General soil map units representative of those on a bolson that is an internally drained intermontane basin. These units are 1—Playas; 6—Jervi-Dun Glen-Tenabo; 11—Reluctan-Roca-Iver; and 13—Puffer-Mulhop-Xine.
This map unit is used for livestock grazing and wildlife habitat.

4. Humboldt-Sonoma-Sondo

Nearly level, very deep, poorly drained, somewhat poorly drained, and well drained soils on flood plains and lake plain terraces

This map unit is on the flood plain along the Humboldt River. The vegetation is mainly basin wildrye, willow, alkali sacaton, and inland saltgrass on Humboldt soils; black greasewood and basin wildrye on Sonoma soils; and black greasewood and seepweed on Sondo soils.

This map unit makes up about 1 percent of the survey area.

Humboldt soils are poorly drained and are on flood plains. They have a thick, dark colored, moderately fine textured surface layer and a stratified, moderately fine textured and fine textured subsoil. They are slightly salt and sodium affected. They are frequently flooded.

Sonoma soils are somewhat poorly drained and are on the outer margins of flood plains and low stream terraces. They have a medium textured surface layer and a stratified, medium textured and moderately fine textured subsoil. They are strongly salt and sodium affected. They are subject to rare flooding.

Sondo soils are well drained and are on lake plain terraces. They have a thin, light colored, medium textured surface layer and a medium textured and moderately fine textured subsoil. They are strongly salt and sodium affected. They are not subject to flooding.

Of minor extent in this map unit are Pocker Variant soils on nearly level flood plains. These soils support
willow, creeping wildrye, and basin wildrye.

This map unit is used mainly for meadow hay, winter grazing, and wildlife habitat.

5. Hawsley-Benin

Nearly level to moderately sloping, very deep, excessively drained and well drained soils on sand sheets and lake plain terraces

This map unit is in the Buena Vista Valley. It is adjacent to Rye Patch Reservoir. The vegetation is mainly fourwing saltbush and Indian ricegrass on Hawsley soils and black greasewood and shadescale on Benin soils.

This map unit makes up about 2 percent of the survey area.

Hawsley soils are excessively drained and are on gently sloping and moderately sloping sand sheets. They have a light colored surface layer and are coarse textured throughout.

Benin soils are well drained and are on nearly level lake plain terraces. They have a thin, light colored, medium textured surface layer and a moderately fine textured and fine textured subsoil. They are strongly salt and sodium affected.

Of minor extent in this map unit are Ixolde soils on moderately steep sand dunes and Wendane soils on nearly level lake plains. Ixolde soils support fourwing saltbush and Indian ricegrass, and Wendane soils support black greasewood.

This map unit is used mainly for livestock grazing and wildlife habitat.

Areas Dominated by Soils on Fan Piedmonts, Fan Skirts, and Inset Fans

This group consists of three map units. The soils in this group are dominantly on fan piedmonts, fan skirts, and inset fans. Elevations are 4,200 to 6,000 feet. The average annual precipitation is 5 to 10 inches, the average annual temperature is 47 to 52 degrees F, and the frost-free period is 90 to 130 days.

6. Jerval-Dun Glen-Tenabo

Nearly level to strongly sloping, shallow and very deep, well drained soils on fan piedmonts and fan skirts

This map unit is in the Buffalo, Buena Vista, Grass, Jersey, and Pleasant Valleys. The vegetation is mainly shadescale, bud sagebrush, and bottlebrush squirreltail.

This map unit makes up about 20.5 percent of the survey area.

Jerval soils are very deep and are on gently sloping and moderately sloping fan piedmont remnants. They have a thin, light colored, gravelly, medium textured surface layer and a medium textured and moderately fine textured subsoil, which is underlain by gravelly, moderately coarse textured material. The subsoil is slightly sodium affected.

Dun Glen soils are very deep and are on nearly level to moderately sloping fan skirts. They are light colored and are medium textured or moderately coarse textured throughout.

Tenabo soils are shallow and are on gently sloping to strongly sloping fan piedmont remnants. They have a thin, light colored, gravelly and cobbly, medium textured surface layer and a moderately fine textured subsoil, which is underlain by an indurated, silica- and lime-cemented hardpan. The subsoil is slightly sodium affected.

Of minor extent in this map unit are Yipor soils on the moderately steep side slopes of drainageways, Trocken Variant soils on moderately sloping inset fans, and Snapp soils in gently sloping and moderately sloping areas adjacent to mountain foot slopes. Yipor soils support shadescale and bud sagebrush, and Trocken Variant and Snapp soils support Wyoming big sagebrush.

This map unit is used mainly for livestock grazing and wildlife habitat.

7. Chiara-Cortez-Orovada

Nearly level to strongly sloping, shallow, moderately deep, and very deep, well drained soils on fan piedmont remnants, inset fans, and fan skirts

This map unit is in the Buena Vista, Pumpernickle, and Grass Valleys. The vegetation is mainly Wyoming big sagebrush, bottlebrush squirreltail, and Sandberg bluegrass.

This map unit makes up about 6 percent of the survey area.

Chiara soils are shallow and are on nearly level to strongly sloping fan piedmont remnants. They have a moderately coarse textured surface layer and a medium textured subsoil, which is underlain by an indurated, silica- and lime-cemented hardpan.

Cortez soils are moderately deep and are on gently sloping to strongly sloping, severely dissected fan piedmont remnants. They have a medium textured surface layer and a fine textured subsoil, which is underlain by an indurated, silica- and lime-cemented hardpan. The subsoil is slightly sodium affected.

Orovada soils are very deep and are on nearly level and moderately sloping inset fans and fan skirts. They are medium textured throughout.

Of minor extent in this map unit are Blackhawk soils. These soils are shallow and are on the steep side slopes of fan piedmont remnants. They support shadescale and bud sagebrush.
This map unit is used mainly for livestock grazing and wildlife habitat.

8. Jerval-Misad-Knoss

Nearly level to moderately sloping, shallow to very deep, well drained soils on fan piedmonts and inset fans

This map unit is in the Antelope, Buena Vista, Dixie, Jersey, and Lovelock Valleys. The vegetation is shadscale, bud sagebrush, pine bluegrass, and some scattered Bailey greasewood.

This map unit makes up about 9 percent of the survey area.

Jerval soils are very deep and are on gently sloping and moderately sloping fan piedmonts. They have a gravelly, medium textured surface layer and a moderately fine textured subsoil, which is underlain by very gravelly, moderately coarse textured material. The subsoil is slightly sodium affected.

Misad soils are very deep and are on nearly level to moderately sloping inset fans. They have a thin, gravelly, medium textured surface layer and are very gravelly and medium textured throughout the rest of the profile.

Knoss soils are shallow and are on gently sloping and moderately sloping fan piedmont remnants. They have a thin, cobbly, medium textured surface layer and a fine textured subsoil, which is underlain by an indurated, silica- and lime-cemented hardpan. The subsoil is slightly sodium affected.

Of minor extent in this map unit are Mazuma soils. These soils are very deep and are on nearly level to moderately sloping fan skirts. They support Bailey greasewood, black greasewood, and shadscale.

This map unit is used mainly for livestock grazing and wildlife habitat.

Areas Dominated by Soils on Foothills and Mountains

This group consists of eight map units. The soils in this group are dominantly on the crests and side slopes of foothills and mountains. Elevations are 4,400 to 9,800 feet. The average annual precipitation is 7 to more than 16 inches, the average annual temperature is 41 to 52 degrees F, and the frost-free period is 60 to 120 days.

9. Theon-Singatse

Steep and very steep, shallow and very shallow, somewhat excessively drained and well drained soils on foothills and low mountains

This map unit is in the Eugene Mountains and the East, Humboldt, Stillwater, and Tobin Ranges. The vegetation is mainly shadscale and bud sagebrush.

This map unit makes up about 8.5 percent of the survey area.

Theon soils are shallow and well drained and are on the steep, convex side slopes of foothills and low mountains. They have a thin, very cobbly, medium textured surface layer and a very gravelly, moderately fine textured subsoil, which is underlain by hard bedrock.

Singatse soils are very shallow and somewhat excessively drained and are on the steep and very steep, concave side slopes of low mountains. They have a thin, extremely cobbly, medium textured surface layer and a very gravelly, medium textured subsoil, which is underlain by hard bedrock.

Of minor extent in this map unit are Urupnes soils on the steep side slopes of foothills and low mountains and Laped soils on the gently sloping and moderately sloping summits of low hills. The minor soils support shadscale, bud sagebrush, and needlegrass.

This map unit is used mainly for livestock grazing and wildlife habitat.

10. Trunk-Burrita-Hoot

Moderately sloping to steep, shallow and moderately deep, well drained soils on low mountains

This map unit is in the Augusta Mountains and the East, Humboldt, Sonoma, and Tobin Ranges. The vegetation is mainly Wyoming big sagebrush and bottlebrush squirreltail on Trunk and Burrita soils and shadscale and bottlebrush squirreltail on Hoot soils.

This map unit makes up about 4.5 percent of the survey area.

Trunk soils are moderately deep and are on the steep side slopes of low mountains. They have a thin, very cobbly, medium textured surface layer and a fine textured subsoil, which is underlain by hard bedrock.

Burrita soils are shallow and are on the moderately sloping to steep crests and convex side slopes of low mountains. They have a very cobbly, medium textured surface layer and a very cobbly, fine textured subsoil, which is underlain by hard bedrock.

Hoot soils are shallow and are on the steep, south-facing side slopes of low mountains. They have a very cobbly, medium textured surface layer and a very gravelly, medium textured subsoil, which is underlain by hard bedrock.

Of minor extent in this map unit are Puffer soils on the steep side slopes of low mountains and Pocan soils on side slopes. Puffer soils support black sagebrush, and Pocan soils support Wyoming big sagebrush.

This map unit is used mainly for livestock grazing and wildlife habitat.
11. Reluctan-Roca-Iver

Moderately steep to very steep, moderately deep and very deep, well drained soils on intermediate mountains

This map unit is in the Augusta and Eugene Mountains and the East, Humboldt, Sonoma, Stillwater, and Tobin Ranges. The vegetation is mainly mountain big sagebrush and Idaho fescue on Reluctan and Iver soils and Wyoming big sagebrush and bluebunch wheatgrass on Roca soils.

This map unit makes up about 15 percent of the survey area.

Reluctan soils are moderately deep and are on the moderately steep and steep, convex, north-facing side slopes of mountains. They have a dark colored, gravelly, medium textured surface layer and a moderately fine textured subsoil, which is underlain by hard bedrock.

Roca soils are moderately deep and are on the steep and very steep, south-facing side slopes of mountains. They have a light colored, very cobbly, medium textured surface layer and a very gravelly, fine textured subsoil, which is underlain by hard bedrock.

Iver soils are very deep and are on the steep and very steep, concave, north-facing side slopes of mountains. They have a thick, dark colored, gravelly or stony, medium textured surface layer and a medium textured subsoil.

Of minor extent in this map unit are Mulhop and Cleavage soils on the steep side slopes of mountains. Mulhop soils support Utah juniper and black sagebrush, and Cleavage soils support low sagebrush and Idaho fescue.

This map unit is used mainly for livestock grazing and wildlife habitat.

12. Layview-Tusel

Moderately sloping to very steep, very shallow and deep, well drained soils on high mountains

This map unit is in the Humboldt and Tobin Ranges. The vegetation is mainly low sagebrush and Idaho fescue on Layview soils and mountain big sagebrush and Idaho fescue on Tusel soils.

This map unit makes up about 1 percent of the survey area.

Layview soils are very shallow and are on the moderately sloping to very steep crests and convex side slopes of mountains. They have a dark colored, gravelly, medium textured surface layer and a very gravelly, medium textured and moderately fine textured subsoil, which is underlain by hard bedrock.

Tusel soils are deep and are on the steep and very steep, concave side slopes of mountains. They have a thick, dark colored, very cobbly, medium textured surface layer and a very gravelly, moderately fine textured subsoil, which is underlain by hard bedrock.

13. Puffer-Mulhop-Xine

Steep and very steep, shallow and moderately deep, well drained soils on intermediate mountains

This map unit is in the Augusta Mountains and the East, Humboldt, Sonoma, Stillwater, and Tobin Ranges. The vegetation is mainly black sagebrush and Sandberg bluegrass on Puffer soils, Utah juniper and black sagebrush on Mulhop soils, and mountain big sagebrush on Xine soils.

This map unit makes up about 5 percent of the survey area.

Puffer soils are shallow and are on the lower steep and very steep, south-facing side slopes of mountains. They have a light colored, very cobbly, medium textured surface layer and a very gravelly and extremely gravelly, medium textured subsoil, which is underlain by hard bedrock.

Mulhop soils are shallow and are on the upper south-facing side slopes of mountains. They are light colored, very gravelly, and medium textured and are underlain by hard bedrock.

Xine soils are moderately deep and are on the steep and very steep, north-facing side slopes of mountains. They have a dark colored, gravelly, medium textured surface layer and a very cobbly, medium textured and moderately coarse textured subsoil, which is underlain by hard bedrock.

Of minor extent in this map unit are Wiskan soils on the steep and very steep, convex, north-facing side slopes of mountains. These soils support black sagebrush.

This map unit is used mainly for livestock grazing and wildlife habitat.

14. Hopeka-Teguro

Steep and very steep, shallow, well drained soils on intermediate mountains

This map unit is in the Augusta and Granite Mountains and the Stillwater Range. The vegetation is
mainly singleleaf pinyon, Utah juniper, and black sagebrush on Hopeka soils and singleleaf pinyon, Utah juniper, and mountain big sagebrush on Teguro soils.

This map unit makes up about 2.5 percent of the survey area.

Hopeka soils are shallow and are on the very steep side slopes of mountains. They are light colored, gravelly, and medium textured and are underlain by hard bedrock.

Teguro soils are shallow and are on the steep side slopes of mountains. They have a dark colored, very stony, medium textured surface layer and a gravelly, medium textured and moderately fine textured subsoil, which is underlain by hard bedrock.

Of minor extent in this map unit are Kra'm soils on the steep and very steep side slopes of mountains and Bojo soils on the steep side slopes of mountains. Kra'm soils support black sagebrush, and Bojo soils support shadscale and bud sagebrush.

The map unit is used mainly for livestock grazing, wildlife habitat, and woodland.

15. Polum-Dekoon-Polum Variant

**Moderately sloping to very steep, very deep and moderately deep, well drained soils on high mountains**

This map unit is in the Humboldt Range. The vegetation is mainly mountain big sagebrush, snowberry, and Idaho fescue on Polum soils; low sagebrush, Idaho fescue, and bluebunch wheatgrass on Dekoon soils; and low sagebrush, black sagebrush, and Idaho fescue on Polum Variant soils.

This map unit makes up about 0.5 percent of the survey area.

Polum soils are very deep and are on the steep, concave side slopes of mountains. They have a dark colored, gravelly, medium textured surface layer and a very gravelly, medium textured subsoil.

Dekoon soils are very deep and are on the very steep, convex side slopes of mountains. They have a dark colored, very gravelly, medium textured surface layer and a gravelly to extremely gravelly, medium textured subsoil.

Polum Variant soils are moderately deep and are on the moderately sloping and strongly sloping crests of mountains. They have a dark colored, extremely gravelly, medium textured surface layer and a very gravelly, medium textured subsoil, which is underlain by hard bedrock.

Of minor extent in this map unit are Tusel soils and rock outcrop. Tusel soils are on the steep, concave, north-facing side slopes of mountains. They support mountain big sagebrush and oceanspray. Rock outcrop supports no vegetation.

This map unit is used mainly for livestock grazing and wildlife habitat.

16. Atlow-Wiskan

**Moderately sloping to very steep, shallow and moderately deep, well drained soils on low and intermediate mountains**

This map unit is in the Eugene Mountains and the Humboldt and Tobin Ranges. The vegetation is mainly black sagebrush and Indian ricegrass on Atlow soils and black sagebrush and bluebunch wheatgrass on Wiskan soils.

This map unit makes up about 3 percent of the survey area.

Atlow soils are shallow and are on the moderately sloping to steep crests and south-facing side slopes of mountains. They have a very gravelly, medium textured surface layer and a very gravelly and very cobbly, moderately fine textured subsoil, which is underlain by hard bedrock.

Wiskan soils are moderately deep and are on the steep and very steep, north-facing side slopes of mountains. They have a very gravelly, medium textured surface layer and a very gravelly, moderately fine textured subsoil, which is underlain by hard bedrock.

Of minor extent in this map unit are Boja soils on the side slopes of mountains and Sumine soils on the steep, concave side slopes of mountains. Boja soils support shadscale, and Sumine soils support mountain big sagebrush and bluebunch wheatgrass.

This map unit is used mainly for livestock grazing and wildlife habitat.

**Broad Land Use Considerations**

The soils in this survey area vary widely in their potential for major land uses, such as cropland, pasture, rangeland, wildlife habitat, and urban development. Extensive changes in land use are not expected in the foreseeable future.

About 96 percent of the land area is used for range and related purposes. Careful management is needed in the areas used for forage production. Map unit 4 has the highest potential for forage production. It is near areas of water, produces the more palatable plants, and tends to be overused. Consequently, the range in areas of this map unit deteriorates. Map units 2, 3, 5, 6, 7, and 8 are used extensively for range. The main limitation in areas of these map units generally is the lack of adequate precipitation. A duripan or bedrock limits the rooting depth in some of the soils in these areas, and rock fragments on the surface of other soils limit the use of equipment. Map units 9, 10, 11, 12, 13, 14, 15, and 16 are well suited to range. The use of
equipment is limited by the slope in most areas of these map units and by rock fragments on the surface in some areas. On some soils in map units 9, 10, 13, and 14, the rooting depth is limited.

About 1 percent of survey area is used as irrigated cropland. About 20 percent of the survey area is suitable for crops if irrigation water is available. The main crops are alfalfa hay, improved grass-legume forage, and small grain, such as barley, wheat, and oats. Small areas in map units 3, 4, 6, and 8 are used as cropland. The main limitation in areas of map units 4, 6, and 7 is the lack of water available for irrigation.

Most of the irrigation water must be pumped from deep strata wells. Wells that produce enough water for irrigation are not readily available. The Dun Glen soils in map unit 6 and the Orovida soils in map unit 7 are well suited to climatically adapted plants. A short growing season limits the selection of plants. In most areas the soils in these map units can produce good yields of irrigated crops if the content of salt and sodium is controlled. On some sloping soils in map units 6 and 7, the slope is a limitation and erosion is a hazard.

About 1 percent of the land in the survey area is used for pasture and meadow hay. Map unit 3 is extensively used for pasture and meadow hay. In most areas it is well suited to those uses. In some areas of this unit, the content of salt and sodium is a limitation.

Almost all of the land in the survey area is inhabited by numerous species of wildlife. The Humboldt River and Rye Patch Reservoir support catfish, black bass, crappie, white bass, and walleye pike. Several of the streams and small ponds in the area support trout.

The habitat for various kinds of wildlife is described in the following paragraphs.

The upland wildlife commonly inhabiting the survey area includes mule deer, pheasant, valley quail, cottontail rabbit, meadowlark, and killdeer. Map unit 3 is extensively used by these species. Wildlife are attracted to the areas of water in this unit and to the food and cover in the native meadows and pastures. Irrigated areas in map units 3, 4, 6, and 7 are extensively used by upland wildlife, and unirrigated areas in these units are used by rangeland wildlife. Watering sites are needed in the unirrigated areas. Planting fence rows and ditches to selected plants can improve the habitat. The adjacent areas of range provide additional cover.

The wetland wildlife commonly inhabiting the survey area includes ducks, geese, herons, muskrat, and beaver. Only map unit 4 has extensive habitat for wetland wildlife. The soils in this map unit support wetland plants. Shallow water areas can be established on the nearly level soils in this unit but cannot be easily established on the more sloping soils. Areas that have been drained because of stream entrenchment are very limited as habitat for wetland wildlife.

The rangeland wildlife commonly inhabiting the survey area includes antelope, mule deer, jackrabbit, chukar, and sage grouse. Nearly all of the map units in the survey area are extensively used by rangeland wildlife. In many areas at the lower elevations, low precipitation limits the native plant community. Properly designing watering facilities and carefully selecting sites for these facilities can improve the habitat.
Detailed Soil Map Units

The map units delineated on the detailed maps at the back of this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the headings “Use and Management of the Soils” and “Soil Properties.”

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

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape 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 facts about the unit and gives the principal hazards or limitations to be considered in planning for a few specific uses.

The detailed soil map units in the survey area reflect the various relationships of soils and component parts of the landscape. Figures 7 and 8 show, in a three-dimensional representation, the soil-physiographic relationships typical of the area. Figure 7 shows the physiographic position of various map units. Figure 8 shows the physiographic position of the major components in the same map units.

Each map unit has one or more major soil components and generally has several contrasting inclusions. The unique physiographic position is given in the map unit descriptions for each soil or miscellaneous area identified (9).

Soils that have profiles that are almost alike make up a soil series. 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 or of the underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into soil phases. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Adelaide silt loam, 2 to 8 percent slopes, is a phase of the Adelaide series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are called associations. 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. Alley-Snowmore-Rock outcrop association is an example.

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

This survey area was mapped at two levels of detail. At the more detailed level, map unit boundaries were
plotted and verified at closely spaced intervals. At the less detailed level, map unit boundaries were plotted and verified at wider intervals. The narrowly defined units are indicated by an asterisk in the legend for the detailed soil maps. The detail of mapping was selected and the map units were designed to meet the needs for the anticipated long-term use of the survey.

Table 4 gives the acreage and proportionate extent of each map unit. The "Glossary" defines many of the terms used in describing the soils or miscellaneous areas.

The following paragraphs explain some of the headings used in the map unit descriptions.

Map unit setting is given for the entire map unit. The setting includes position on the landscape, elevation, and climate. The landscape positions given under this heading generally are broader than those given for each major component. The elevation and climatic data apply to the entire unit rather than the individual components.

Composition is given for the components identified in the name of the map unit as well as the contrasting inclusions. Inclusions are areas of soils or miscellaneous areas that differ from the soils or miscellaneous areas for which the unit is named. Inclusions can be either similar or contrasting. Similar inclusions are components that differ from the components for which the unit is named but that for purposes of use and management can be considered to be the same as the named components. Under the heading "Composition," a single percentage is provided for a named soil and the similar inclusions because their use and management are similar.

Contrasting inclusions are components that differ so significantly from the components for which the unit is named that they would have different use and management if they were extensive enough to be managed separately. For most uses, contrasting inclusions have a limited effect on use and management. Inclusions, which are generally in small areas, could not be mapped separately because of the scale used in mapping. A special symbol on the detailed soil maps identifies some small areas of

Figure 7.—The physiographic position of various detailed soil map units. These units are 233—Dun Glen very fine sandy loam, 0 to 2 percent slopes; 322—Humboldt silty clay loam, strongly saline-sodic; 652—Burrita-Hoot-Rock outcrop association; 663—Oxcorel-Weso-Beoska association; 901—Roca-Reluctan association; and 1291—Slaven-Iver-Cleavage association.
strongly contrasting inclusions. A few inclusions may not have been observed and consequently 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 inclusions on the landscape.

A description of the characteristics of the soils or miscellaneous areas in the map unit follows the description of composition. These characteristics include position on the landscape, parent material, slope features, the dominant present vegetation, the typical profile, and soil and water features.

After the description of the characteristics of the soils or miscellaneous areas in the map unit, the position on the landscape and distinctive present vegetation of the contrasting inclusions are described.

At the end of the descriptions, the major uses of the map unit are indicated. Also indicated are the suitability for wildlife habitat elements, ratings and restrictive

features for selected uses and practices, and interpretive groups. The selected uses and practices include range seeding; daily cover for landfill; shallow excavations; local roads and streets; roadfill; sand; gravel; topsoil; pond reservoir areas; embankments, dikes, and levees; drainage; irrigation; and terraces and diversions. The “Appendix” indicates the criteria used to develop these ratings.

Map Unit Descriptions

001—Playas

Map Unit Setting

*Position on landscape:* Bolson floors
*Elevation:* 3,890 to 4,600 feet
*Average annual precipitation:* About 8 inches
*Average annual air temperature:* About 48 degrees F
Frost-free period: About 100 days

**Composition**

Major component:
- Playas—100 percent

**Characteristics of the Playas**

Position on landscape: Final sink area of bolson floors
Slope features: Length—long; shape—smooth or slightly concave
Dominant present vegetation: Barren

002—Badland

**Map Unit Setting**

Position on landscape: Bolson floors
Elevation: 4,000 to 4,300 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

**Composition**

Major component:
- Badland—100 percent

**Characteristics of the Badland**

Position on landscape: Lake plain terraces
Slope features: Length—short; shape—convex
Dominant present vegetation: Barren

003—Slickens

**Map Unit Setting**

Position on landscape: Bolson floors
Elevation: 4,000 to 4,100 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 120 days

**Composition**

Major component:
- Slickens—100 percent

**Characteristics of the Slickens**

Position on landscape: Lake plain terraces
Slope features: Length—short; shape—smooth or slightly concave
Dominant present vegetation: Barren

004—Dumps, mine

**Map Unit Setting**

Position on landscape: Hillsides and the adjacent fan piedmonts
Elevation: 4,000 to 7,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days

**Composition**

Major component:
- Dumps, mine—100 percent

**Characteristics of Dumps, Mine**

Position on landscape: Mine spoil areas on hillsides and the adjacent fan piedmonts
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Barren or annual grasses, forbs, and rabbitbrush

005—Pits, gravel

**Map Unit Setting**

Position on landscape: Fan piedmonts or beach plains
Elevation: 3,900 to 4,300 feet
Average annual precipitation: About 6 to 10 inches
Average annual air temperature: About 42 to 48 degrees F
Frost-free period: About 80 to 120 days

**Composition**

Major component:
- Pits, gravel—100 percent

**Characteristics of Pits, Gravel**

Position on landscape: Fan piedmonts or beach plains
Parent material: Mixed alluvium or lacustrine beach deposits
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Barren

110—Adelaide silt loam, 2 to 8 percent slopes

**Map Unit Setting**

Position on landscape: Fan piedmonts
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

**Composition**

Major component:
- Adelaide silt loam, 2 to 8 percent slopes—Entic Durorthids, loamy, mixed, mesic, shallow—85 percent
Contrasting inclusions:
- Inclusion 1: Blackhawk silt loam, 2 to 8 percent slopes—Etric Durothinds, loamy, mixed, mesic, shallow—5 percent
- Inclusion 2: Golconda silt loam, 2 to 8 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—5 percent
- Inclusion 3: Weso silt loam, 2 to 8 percent slopes—Duric Cambloths, coarse-loamy, mixed, mesic—5 percent

Characteristics of the Adelaide Soil

Position on landscape: Convex summits of fan piedmont remnants
Parent material: Loess high in content of volcanic ash over mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, Thurber needlegrass, bottlebrush squirreltail

Typical profile

0 to 2 inches—silt loam; 10 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
2 to 11 inches—loam; 10 to 20 percent pebbles (by weight); weak fine subangular blocky structure; massive; slightly hard, friable; moderately alkaline (pH 8.0); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4
11 to 14 inches—cemented layer; massive; extremely hard, very firm
14 to 30 inches—clay loam; 0 to 5 percent cobbles and stones and 0 to 10 percent pebbles (by weight); angular blocky structure; hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
30 to 40 inches—indurated layer; massive; extremely hard, extremely firm
40 to 60 inches—extremely gravelly loamy sand; 0 to 5 percent cobbles and stones and 75 to 90 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 10 to 15 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 1.5 to 2.4 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value=.55; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Foot slopes of partial ballenas
Distinctive present vegetation: Shadscale

Inclusion 2
Position on landscape: Summits of fan piedmonts
Distinctive present vegetation: Shadscale

Inclusion 3
Position on landscape: Fan skirts
Distinctive present vegetation: Shadscale

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Adelaide soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Adelaide soil for selected uses and practices

Range seeding: Poor—droughty, too arid, excess salt
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—low strength
Roadfill: Poor—cemented pan
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones
Pond reservoir areas: Severe—cemented pan
Embankments, dikes, and levees: Severe—thin layer
Drainage: Deep to water
Irrigation: Slope, cemented pan, erodes easily
Terraces and diversions: Cemented pan, erodes easily
Interpretive Groups

Capability classification: IVe, irrigated, and VII, nonirrigated
Range site: 024X020N

112—Adelaide silt loam, 4 to 15 percent slopes

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
- Adelaide silt loam, 4 to 15 percent slopes—Entic Durothids, loamy, mixed, mesic, shallow—85 percent

Contrasting inclusions:
- Inclusion 1: Blackhawk silt loam, 4 to 15 percent slopes—Entic Durothids, loamy, mixed, mesic, shallow—5 percent
- Inclusion 2: Golconda silt loam, 4 to 15 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—5 percent
- Inclusion 3: Weso silt loam, 2 to 8 percent slopes—Doric Camborthids, coarse-loamy, mixed, mesic—5 percent

Characteristics of the Adelaide Soil

Position on landscape: Summits of fan piedmont remnants
Parent material: Loess high in content of volcanic ash over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, Thurber needlegrass, bottlebrush squirreltail

Typical profile

0 to 2 inches—silt loam; 10 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
2 to 11 inches—loam; 10 to 20 percent pebbles (by weight); weak fine subangular blocky structure; massive; slightly hard, friable; moderately alkaline (pH 8.0); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
11 to 14 inches—cemented layer; massive; extremely hard, very firm
14 to 30 inches—clay loam; 0 to 5 percent cobbles and stones and 0 to 10 percent pebbles (by weight); angular blocky structure; hard, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
30 to 40 inches—indurated layer; massive; extremely hard, extremely firm
40 to 60 inches—extremely gravelly loamy sand; 0 to 5 percent cobbles and stones and 75 to 90 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 10 to 15 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the hardpan—moderate
Available water capacity: 1.5 to 2.4 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.55; T value—2; wind erodibility group—5
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Foot slopes of partial ballenas
Distinctive present vegetation: Shadscale

Inclusion 2
Position on landscape: Summits of fan piedmont remnants
Distinctive present vegetation: Shadscale

Inclusion 3
Position on landscape: Fan aprons
Distinctive present vegetation: Shadscale

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Adelaide soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous
plants (nonirrigated)—poor; shrubs (nonirrigated)—
poor

**Ratings and restrictive features of the Adelaide soil**
for selected uses and practices

**Range seeding:** Poor—too arid, droughty
**Daily cover for sandfill:** Poor—cemented pan
**Shallow excavations:** Severe—cemented pan
**Local roads and streets:** Severe—low strength
**Roadfill:** Poor—cemented pan
**Sand:** Improbable source—small stones
**Gravel:** Probable source
**Topsoil:** Poor—cemented pan, area reclaim, excess salt
**Embarkments, dikes, and levees:** Severe—thin layer
**Drainage:** Deep to water
**Irrigation:** Slope, cemented pan, erodes easily
**Terraces and diversions:** Cemented pan, erodes easily, slope

**Interpretive Groups**

**Capability classification:** IVe, irrigated, and VIls, nonirrigated
**Range site:** 024X020N

**113—Adelaide silt loam, 0 to 2 percent slopes**

**Map Unit Setting**

**Position on landscape:** Fan piedmonts
**Elevation:** 4,000 to 5,000 feet
**Average annual precipitation:** About 9 inches
**Average annual air temperature:** About 48 degrees F
**Frost-free period:** About 110 days

**Composition**

**Major component:**
- Adelaide silt loam, 0 to 2 percent slopes—Entic
- Durorthids, loamy, mixed, mesic, shallow—85 percent

**Contrasting inclusions:**
- Inclusion 1: Weso silt loam, 0 to 2 percent slopes—
  Duric Camborthids, coarse-loamy, mixed, mesic—8 percent
- Inclusion 2: Blackhawk silt loam, 0 to 2 percent slopes—
  Entic Durorthids, loamy, mixed, mesic, shallow—4 percent
- Inclusion 3: Golconda silt loam, 0 to 2 percent slopes—
  Haplic Nadurargids, fine-loamy, mixed, mesic—
  3 percent

**Characteristics of the Adelaide Soil**

**Position on landscape:** Summits of fan piedmont remnants

**Parent material:** Loess high in content of volcanic ash
over mixed alluvium

**Slope features:** Length—long; shape—smooth

**Dominant present vegetation:** Wyoming big sagebrush,
spiny hopsage, Thurber needlegrass, bottlebrush
squirreltail

**Typical profile**

0 to 2 inches—silt loam; 10 to 20 percent pebbles (by
weight); platy structure; slightly hard, very friable;
neutral (pH 6.8); nonsaline (less than 2 mmhos/cm);
nonsodic (SAR less than 13); estimated Unified
classification—ML, CL-ML; estimated AASHTO
classification—A-4

2 to 11 inches—loam; 10 to 20 percent pebbles (by
weight); weak fine subangular blocky structure;
massive; slightly hard, friable; moderately alkaline
(pH 8.0); slightly saline (4 to 8 mmhos/cm); slightly
dodic (SAR 13 to 23); estimated Unified
classification—ML, CL-ML; estimated AASHTO
classification—A-4

11 to 14 inches—cemented layer; massive; extremely hard,
very firm

14 to 30 inches—clay loam; 0 to 5 percent cobbles and
stones and 0 to 10 percent pebbles (by weight);
angular blocky structure; hard, friable; strongly
alkaline (pH 9.0); moderately saline (8 to 16
mmhos/cm); slightly sodic (SAR 13 to 23);
estimated Unified classification—CL; estimated
AASHTO classification—A-6, A-7

30 to 40 inches—indurated layer; massive; extremely hard,
extremely firm

40 to 60 inches—extremely gravelly loamy sand; 0 to 5
percent cobbles and stones and 75 to 90 percent
pebbles (by weight); single grain; loose; moderately
alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm);
nonsodic (SAR less than 13); estimated Unified
classification—GP, GP-GM; estimated AASHTO
classification—A-1

**Soil and water features**

**Depth to a hardpan:** 10 to 15 inches

**Depth to a seasonal high water table:** More than 60
inches

**Flooding:** None

**Permeability:** Above the hardpan—moderate

**Available water capacity:** 1.5 to 2.4 inches

**Water-supplying capacity:** About 6 inches

**Runoff:** Very slow

**Hydrologic group:** D

**Erosion factors (surface layer):** K value—.55; T value—
2; wind erodibility group—5

**Hazard of erosion:** By water—slight; by wind—slight

**Shrink-swell potential:** Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* Fan skirts
*Distinctive present vegetation:* Shadscale

**Inclusion 2**
*Position on landscape:* The lower part of fan piedmont remnants
*Distinctive present vegetation:* Shadscale

**Inclusion 3**
*Position on landscape:* The upper part of fan piedmont remnants
*Distinctive present vegetation:* Shadscale

**Major Uses**

*Current uses:* Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Adelaide soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings and restrictive features of the Adelaide soil for selected uses and practices**

*Range seeding:* Poor—droughty, too arid
*Daily cover for landfill:* Poor—cemented pan
*Shallow excavations:* Severe—cemented pan
*Local roads and streets:* Severe—low strength
*Roadfill:* Poor—cemented pan
*Sand:* Improbable source—small stones
*Gravel:* Probable source
*Topsoil:* Poor—cemented pan
*Pond reservoir areas:* Severe—cemented pan
*Embankments, dikes, and levees:* Severe—thin layer
*Drainage:* Deep to water
*Irrigation:* Cemented pan, erodes easily
*Terraces and diversions:* Cemented pan, erodes easily

**Interpretive Groups**

*Capability classification:* IVe, irrigated, and VII, nonirrigated
*Range site:* 024X020N

**Average annual air temperature:** About 51 degrees F
**Frost-free period:** About 110 days

**Composition**

*Major component:* Hawsley sand, moderately wet, 0 to 2 percent slopes—Typic Torripsamments, mixed, mesic—85 percent
*Contrasting inclusions:* Hawsley sand, moderately wet, 0 to 2 percent slopes—Durothric Torriorthents, coarse-loamy, mixed (calcareous), mesic—8 percent
*Inclusion 2:* Valmy fine sandy loam, 0 to 2 percent slopes—Durothric Torriorthents, coarse-loamy, mixed (calcareous), mesic—4 percent
*Inclusion 3:* Mazuma fine sandy loam, strongly saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent

**Characteristics of the Hawsley Soil**

*Position on landscape:* Sand sheets
*Parent material:* Sandy eolian material
*Slope features:* Length—long; shape—smooth
*Dominant present vegetation:* Black greasewood, Indian ricegrass, Nevada dalea

**Typical profile**

0 to 3 inches—sand; 0 to 10 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3
3 to 60 inches—stratified fine sand to coarse sand; single grain; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Very rapid
*Available water capacity:* 3.6 to 4.8 inches
*Water-supplying capacity:* About 5 inches
*Runoff:* Very slow
*Hydrologic group:* A
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—1
*Hazard of erosion:* By water—slight; by wind—severe
*Shrink-swell potential:* Low
*Corrosivity:* To steel—high; to concrete—low
*Potential for frost action:* Low

**120—Hawsley sand, moderately wet, 0 to 2 percent slopes**

**Map Unit Setting**

*Position on landscape:* Sand sheets
*Elevation:* 3,800 to 4,400 feet
*Average annual precipitation:* About 5 inches
Contrasting Inclusions

Inclusion 1
Position on landscape: Eroded areas and margins of sand sheets
Distinctive present vegetation: Black greasewood, Indian ricegrass, Nevada dalea

Inclusion 2
Position on landscape: Margins of sand sheets
Distinctive present vegetation: Black greasewood, big sagebrush

Inclusion 3
Position on landscape: Alluvial flats
Distinctive present vegetation: Black greasewood

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Hawsley soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Hawsley soil for selected uses and practices

Range seeding: Poor—soil blowing, too arid, too sandy
Daily cover for landfill: Poor—seepage, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Improbable source—too sandy
Topsoil: Poor—too sandy
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping, seepage
Drainage: Deep to water
Irrigation: Droughty, soil blowing, fast intake
Terraces and diversions: Too sandy, soil blowing

Interpretive Groups

Capability classification: IVs, irrigated, and VIIs, nonirrigated
Range site: 027X012N

Frost-free period: About 110 days

Composition

Major component:
• Hawsley fine sand, 2 to 8 percent slopes—Typic Torripsamments, mixed, mesic—85 percent
Contrasting inclusions:
• Inclusion 1: Isolde fine sand, 15 to 50 percent slopes—Typic Torripsamments, mixed, mesic—8 percent
• Inclusion 2: Ragnetown silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine, montmorillonitic (calcareous), mesic—7 percent

Characteristics of the Hawsley Soil

Position on landscape: Sand sheets
Parent material: Sandy eolian material
Slope features: Length—long; shape—convex
Distinctive present vegetation: Fourwing saltbush, Nevada dalea, Indian ricegrass, Bailey greasewood

Typical profile

0 to 3 inches—fine sand; 0 to 10 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
3 to 60 inches—stratified fine sand to coarse sand; single grain; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very rapid
Available water capacity: 3.6 to 4.8 inches
Water-supplying capacity: About 5 inches
Runoff: Very slow
Hydrologic group: A
Erosion factors (surface layer): K value—.15; T value—5; wind erodibility group—1
Hazard of erosion: By water—slight; by wind—severe
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Map Unit Setting

Position on landscape: Sand sheets
Elevation: 3,800 to 4,400 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 51 degrees F

121—Hawsley fine sand, 2 to 8 percent slopes

Contrasting Inclusions

Inclusion 1
Position on landscape: Sand dunes
Distinctive present vegetation: Indian ricegrass, black greasewood
Inclusion 2

Position on landscape: Lake plain terraces
Distinctive present vegetation: Black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Hawsley soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Hawsley soil for selected uses and practices

Range seeding: Poor—soil blowing, too arid, too sandy
Daily cover for eyelid: Poor—seepage, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Improbable source—too sandy
Topsoil: Poor—too sandy
Pond reservoir areas: Severe—seepage
Embarkments, dikes, and levees: Severe—piping, seepage
Drainage: Deep to water
Irrigation: Droughty, slope, fast intake
Terraces and diversions: Too sandy, soil blowing

Interpretive Groups

Capability classification: IVs, irrigated, and VII, nonirrigated
Range site: 027X009N

122—Hawsley-Ragtown association

Map Unit Setting

Position on landscape: Sand sheets, lake plains
Elevation: 3,700 to 4,400 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

Composition

Major components:
• Hawsley fine sand, 2 to 8 percent slopes—Typic Torripsamments, mixed, mesic—50 percent
• Ragtown silt loam, 0 to 2 percent slopes—Typic Torrithents, fine, montmorillonitic (calcareous), mesic—35 percent

Contrasting inclusions:
• Inclusion 1: Valmy fine sandy loam, 2 to 8 percent slopes—Durortihic Torrithents, coarse-loamy, mixed (calcareous), mesic—4 percent
• Inclusion 2: Aeric Halaquepts silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine, montmorillonitic (calcereous), mesic—4 percent
• Inclusion 3: Isolde fine sand, 15 to 30 percent slopes—Typic Torripsamments, mixed, mesic—4 percent
• Inclusion 4: Aquic Durorthid Torrithents silt loam, 0 to 2 percent slopes—Aquic Durorthid Torriorthents, fine, montmorillonitic (calcereous), mesic—3 percent

Characteristics of the Hawsley Soil

Position on landscape: Sand sheets
Parent material: Sandy eolian material
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Fourwing saltbush, Nevada dalea, Indian ricegrass, Bailey greasewood

Typical profile

0 to 3 inches—fine sand; 0 to 10 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
3 to 60 inches—stratified fine sand to coarse sand; single grain; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very rapid
Available water capacity: 3.6 to 4.8 inches
Water-supplying capacity: About 5 inches
Runoff: Very slow
Hydrologic group: A
Erosion factors (surface layer): K value—.15; T value—5; wind erodibility group—1
Hazard of erosion: By water—slight; by wind—severe
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Ragtown Soil

Position on landscape: Lake plain terraces
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, shadscale

Typical profile

0 to 7 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
7 to 60 inches—stratified silty clay loam to clay; massive; hard; firm; very strongly alkaline (pH 9.2); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: Frequency—frequent; duration—very brief; months—November through June
Permeability: Slow
Available water capacity: 9.5 to 11.1 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Sand sheets adjacent to alluvial flats
Distinctive present vegetation: Basin wildrye, black greasewood

Inclusion 2
Position on landscape: Lake plains
Distinctive present vegetation: Black greasewood

Inclusion 3
Position on landscape: Sand dunes
Distinctive present vegetation: Indian ricegrass, black greasewood

Inclusion 4
Position on landscape: Alluvial flats
Distinctive present vegetation: Indian ricegrass, shadscale

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Hawsley soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—poor

Suitability of the Ragtown soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Hawsley soil for selected uses and practices

Range seeding: Poor—soil blowing, too arid, too sandy
Daily cover for landfill: Poor—seepage, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Improbable source—too sandy
Topsoil: Poor—too sandy
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping, seepage
Drainage: Deep to water
Irrigation: Droughty, slope, fast intake
Terraces and diversions: Too sandy, soil blowing

Ratings and restrictive features of the Ragtown soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too crusty
Daily cover for landfill: Poor—hard to pack
Shallow excavations: Moderate—flooding, too clayey
Local roads and streets: Severe—shrink-swell, low strength, flooding
Roadfill: Poor—shrink-swell, low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, too clayey
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt

Interpretive Groups

Capability classification: Hawsley—IVs, irrigated, and VVs, nonirrigated; Ragtown—VIIIw, nonirrigated
Range site: Hawsley—027X009N; Ragtown—027X025N

131—Jerval-Chilper-Bluewing association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,200 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 51 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Jerval stony loam, 2 to 8 percent slopes—Duric Natragids, fine-loamy, mixed, mesic—40 percent
- Chilper very stony loam, 2 to 8 percent slopes—Duric Natragids, fine, montmorillonitic, mesic—35 percent
- Bluewing very gravelly loam, 2 to 8 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—15 percent

Contrasting inclusions:
- Inclusion 1: Mazuma very fine sandy loam, 0 to 4 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—7 percent
- Inclusion 2: Yiper silt loam, 2 to 4 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—2 percent
- Inclusion 3: Bluewing gravelly loam, frequently flooded, 2 to 8 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—1 percent

Characteristics of the Jerval Soil

Position on landscape: The lower part of fan piedmont remnants
Parent material: Loess over loamy and gravelly alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—10

Typical profile

0 to 6 inches—stony loam; 5 to 10 percent cobbles and stones and 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

6 to 22 inches—gravelly clay loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); prismatic structure; hard, friable; strongly alkaline (pH 8.5); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-4

22 to 60 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); moderately saline or strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 5.5 to 6.3 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value=.55; T value=.5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Chilper Soil

Position on landscape: Side slopes of fan piedmont remnants
Parent material: Mixed alluvium somewhat influenced by loess and volcanic ash
Slope features: Length—long; shape—plane to convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—37

Typical profile

0 to 3 inches—very stony loam; 10 to 15 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

3 to 13 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 25 percent pebbles (by weight); subangular blocky structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 29 inches—clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.9); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

29 to 60 inches—extremely gravelly sandy loam; 0 to 10 percent cobbles and stones and 75 to 90 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 9.0); strongly saline (more...
than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Very slow

**Available water capacity:** 5.1 to 6.6 inches

**Water-supplying capacity:** About 6 inches

**Runoff:** Medium

**Hydrologic group:** D

**Erosion factors (surface layer):** K value—.43; T value—2; wind erodibility group—7

**Hazard of erosion:** By water—slight; by wind—slight

**Shrink-swell potential:** Very high

**Corrosivity:** To steel—high; to concrete—high

**Potential for frost action:** Low

**Characteristics of the Bluewing Soil**

**Position on landscape:** Inset fans

**Parent material:** Mixed alluvium

**Slope features:** Length—long; shape—concave

**Dominant present vegetation:** Shadscale, bud sagebrush, Bailey greasewood, bottlebrush squirreltail

**Rock fragments on the surface:** Kind—gravel, cobbles; percentage of surface covered—42

**Typical profile**

0 to 5 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

5 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** In the upper 5 inches—moderate; below that depth—very rapid

**Available water capacity:** 1.9 to 3.1 inches

**Water-supplying capacity:** About 6 inches

**Runoff:** Medium

**Hydrologic group:** A

**Erosion factors (surface layer):** K value—.15; T value—5; wind erodibility group—8

**Hazard of erosion:** By water—slight; by wind—slight

**Shrink-swell potential:** Low

**Corrosivity:** To steel—high; to concrete—low

**Potential for frost action:** Low

**Contrasting Inclusions**

**Inclusion 1**

**Position on landscape:** Smooth fan skirts

**Distinctive present vegetation:** Bottlebrush squirreltail, shadscale

**Inclusion 2**

**Position on landscape:** Areas adjacent to drainageways

**Distinctive present vegetation:** Black greasewood

**Inclusion 3**

**Position on landscape:** Narrow drainageways on fan piedmonts

**Distinctive present vegetation:** Rubber rabbitbrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements**

**Suitability of the Jerval soil for named elements:** Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Suitability of the Chiper soil for named elements:** Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Suitability of the Bluewing soil for named elements:** Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings and restrictive features of the Jerval soil for selected uses and practices**

**Range seeding:** Poor—too arid, excess salt, excess sodium

**Daily cover for landfill:** Poor—small stones

**Shallow excavations:** Slight

**Local roads and streets:** Slight

**Roadfill:** Good

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Topsoil:** Small stones, area reclaim, excess salt

**Pond reservoir areas:** Severe—see page
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium
Drainage: Deep to water
Irrigation: Slope, excess sodium
Terraces and diversions: Erodes easily

Ratings and restrictive features of the Chilper soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Good
Sand: Improbable source—small stones
Gravel: Probable source
Topsoil: Poor—small stones, too clayey, area reclaim
Pond reservoir areas: Moderate—slope
Embankments, dikes, and levees: Severe—seepage, excess sodium, excess salt
Drainage: Deep to water
Irrigation: Percs slowly, slope, erodes easily
Terraces and diversions: Erodes easily

Ratings and restrictive features of the Bluewing soil for selected uses and practices

Range seeding: Poor—too arid, small stones
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty, slope
Terraces and diversions: Large stones, too sandy

Interpretive Groups
Capability classification: Jerval—Il, irrigated, and Vlls, nonirrigated; Chilper—IVs, irrigated, and Vlls, nonirrigated; Bluewing—IVs, irrigated, and Vlls, nonirrigated
Range site: Jerval—027X028N; Chilper—027X028N; Bluewing—027X030N

Elevation: 4,200 to 5,000 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 51 degrees F
Frost-free period: About 110 days

Composition
Major components:
• Jerval gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natargids, fine-loamy, mixed, mesic—45 percent
• Knoss cobbly very fine sandy loam, 2 to 8 percent slopes—Typic Natargids, clayey, montmorillonitic, mesic, shallow—25 percent
• Chilper cobbly very fine sandy loam, 30 to 50 percent slopes—Duric Natargids, fine, montmorillonitic, mesic—20 percent

Contrasting inclusions:
• Inclusion 1: Trocken very cobbly loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—6 percent
• Inclusion 2: Jerval cobbly very fine sandy loam, moderately saline-sodic, 0 to 4 percent slopes—Duric Natargids, fine-loamy, mixed, mesic—2 percent
• Inclusion 3: Bluewing very cobbly sandy loam, frequently flooded, 2 to 8 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—1 percent
• Inclusion 4: Typic Natargids stony very fine sandy loam, 15 to 30 percent slopes—Typic Natargids, fine, montmorillonitic mesic—1 percent

Characteristics of the Jerval Soil
Position on landscape: The lower part of fan piedmont remnants
Parent material: Loess over loamy and gravelly alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—25

Typical profile
0 to 6 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
6 to 22 inches—gravelly clay loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); prismatic structure; hard, friable; strongly alkaline (pH 8.5); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified

132—Jerval-Knoss-Chilper association

Map Unit Setting
Position on landscape: Fan piedmonts
classification—CL; estimated AASHTO
classification—A-4
22 to 60 inches—very gravelly sandy loam; 0 to 10
percent cobbles and stones and 50 to 65 percent
pebbles (by weight); massive; soft, very friable;
strongly alkaline (pH 8.5); slightly saline to strongly
saline (more than 8 mmhos/cm); nonsodic (SAR
less than 13); estimated Unified classification—GM;
estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60
inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 5.5 to 6.3 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.17; T value—
5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Knoss Soil

Position on landscape: The upper part of fan piedmont
remnants
Parent material: Mixed alluvium somewhat influenced by
loess
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud
sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles,
stones; percentage of surface covered—22

Typical profile

0 to 7 inches—cobbly very fine sandy loam; 10 to 25
percent cobbles and stones and 15 to 35 percent
pebbles (by weight); platy structure; slightly hard,
very friable; strongly alkaline (pH 8.8); nonsaline
(less than 2 mmhos/cm); nonsodic (SAR less than
13); estimated Unified classification—ML, SM;
estimated AASHTO classification—A-4
7 to 15 inches—clay; 0 to 5 percent cobbles and stones
and 0 to 25 percent pebbles (by weight); prismatic
structure; hard, firm; strongly alkaline (pH 8.8);
slightly saline or moderately saline (4 to 16 mmhos/
cm); strongly sodic (SAR more than 46); estimated
Unified classification—CL, CH; estimated AASHTO
classification—A-7
15 to 52 inches—indurated layer; platy structure;
extremely hard, extremely firm; very strongly
alkaline (pH 9.4)

52 to 60 inches—extremely gravelly coarse sandy loam;
5 to 15 percent cobbles and stones and 75 to 90
percent pebbles (by weight); massive; loose; very
strongly alkaline (pH 9.0); nonsaline (less than 2
mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—GP-GM; estimated
AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60
inches
Flooding: None
Permeability: Slow
Available water capacity: 2.0 to 2.3 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.28; T value—
1; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Characteristics of the Chilper Soil

Position on landscape: Side slopes of fan piedmont
remnants
Parent material: Mixed alluvium somewhat influenced by
loess and volcanic ash
Slope features: Length—long; shape—plane
Dominant present vegetation: Shadscale, bud
sagebrush, bottlebrush squirreltail, Bailey
greasewood
Rock fragments on the surface: Kind—gravel, cobbles,
stones; percentage of surface covered—17

Typical profile

0 to 3 inches—cobbly very fine sandy loam; 10 to 25
percent cobbles and stones and 15 to 35 percent
pebbles (by weight); platy structure; slightly hard,
very friable; moderately alkaline (pH 8.4); nonsaline
(less than 2 mmhos/cm); nonsodic (SAR less than
13); estimated Unified classification—ML; estimated
AASHTO classification—A-4
3 to 13 inches—very fine sandy loam; 0 to 5 percent
pebbles and stones and 0 to 25 percent pebbles (by
weight); subangular blocky structure; hard, friable;
moderately alkaline (pH 8.4); nonsaline (less than 4
mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—ML; estimated
AASHTO classification—A-4
13 to 29 inches—sandy loam; 0 to 25 percent pebbles (by
weight); prismatic structure; hard, firm; strongly
alkaline (pH 8.9); strongly saline (more than 16
mmhos/cm); strongly sodic (SAR more than 46);
estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
29 to 60 inches—extremely gravelly sandy loam; 0 to 10 percent cobbles and stones and 75 to 90 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 9.0); strongly saline (more than 16 mmmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 5.1 to 6.6 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.37; T value—2; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions
Inclusion 1
Position on landscape: The convex lower part of inset fans
Distinctive present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Inclusion 2
Position on landscape: The convex upper part of inset fans
Distinctive present vegetation: Black greasewood

Inclusion 3
Position on landscape: Narrow drainageways on fan piedments
Distinctive present vegetation: Rubber rabbitbrush

Inclusion 4
Position on landscape: The convex upper part of fan piedmont remnants adjacent to mountains
Distinctive present vegetation: Black sagebrush

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Jerval soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Knoss soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Chiper soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Jerval soil for selected uses and practices
Range seeding: Poor—too arid, too crusty, excess salt
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium
Drainage: Deep to water
Irrigation: Droughty, slope, excess sodium
Terraces and diversions: Favorable

Ratings and restrictive features of the Knoss soil for selected uses and practices
Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—cememented pan
Shallow excavations: Severe—cememented pan, cutbanks cave
Local roads and streets: Severe—cememented pan
Roadfill: Poor—cememented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—cememented pan, excess sodium, excess salt
Pond reservoir areas: Severe—seepage, cememented pan
Embankments, dikes, and levees: Severe—thin layer, excess salt
Drainage: Deep to water
Irrigation: Droughty, percs slowly, cememented pan
Terraces and diversions: Cememented pan, erodes easily

Ratings and restrictive features of the Chiper soil for selected uses and practices
Range seeding: Poor—too arid, too crusty, erodes easily
Daily cover for landfill: Poor—seepage, small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—low strength, shrink-swell, slope
Roadfill: Poor—slope
Sand: Improbable source—small stones
Gravel: Probable source
Topsoil: Poor—small stones, too clayey, area reclaim
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium

Interpretive Groups
Capability classification: Jerval—Ills, irrigated, and VIIIs, nonirrigated; Knoss—IVe, irrigated, and VIIIs, nonirrigated; Chiper—VIIIs, nonirrigated
Range site: Jerval—027X028N; Knoss—027X028N; Chiper—027X030N

133—Jerval-Trocken-Golconda association

Map Unit Setting
Position on landscape: Fan piedmonts
Elevation: 4,500 to 5,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 51 degrees F
Frost-free period: About 110 days

Composition
Major components:
• Jerval gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—45 percent
• Trocken gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—25 percent
• Golconda gravelly very fine sandy loam, 2 to 8 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—15 percent

Contrasting inclusions:
• Inclusion 1: Haploxerollic Durorthids gravelly very fine sandy loam, 2 to 8 percent slopes—Haploxerollic Durorthids, fine-loamy, mixed, mesic—8 percent
• Inclusion 2: Durorthic Xeric Torriorthents cobbly loam, 2 to 8 percent slopes—Durorthic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—7 percent

Characteristics of the Jerval Soil
Position on landscape: The lower part of fan piedmont remnants
Parent material: Loess over loamy and gravelly alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—25

Typical profile
0 to 6 inches—gravely very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
6 to 22 inches—gravely clay loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); prismatic structure; hard, friable; strongly alkaline (pH 8.5); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-4
22 to 60 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); moderately saline or strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 5.6 to 6.3 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.17; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Trocken Soil
Position on landscape: Fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

Typical profile
0 to 3 inches—gravely very fine sandy loam; 0 to 15 percent cobbles and stones and 25 to 40 percent
pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4
3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobbly loam; 5 to 40 percent cobbles and stones and 60 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 3.0 to 4.8 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.32; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Golconda Soil

Position on landscape: The upper part of fan piedmont remnants
Parent material: Mixed alluvium with a mantle of loess high in content of volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

Typical profile

0 to 10 inches—gravely very fine sandy loam; 0 to 10 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4
10 to 23 inches—gravely clay loam; 10 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7
23 to 36 inches—cemented layer; massive; extremely hard, extremely firm; moderately alkaline (pH 8.4)
36 to 60 inches—very gravelly loamy coarse sand; 50 to 75 percent pebbles (by weight); massive; very hard, very firm; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 4.9 to 6.1 inches
Water-supplying capacity: About 4 to 6 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (surface layer): K value—.17; T value—2; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex fan piedmont remnants adjacent to mountains
Distinctive present vegetation: Wyoming big sagebrush

Inclusion 2
Position on landscape: Narrow drainageways on fan piedmonts
Distinctive present vegetation: Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Jerval soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Trocken soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Golconda soil for named elements:
Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Ratings and restrictive features of the Jerval soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess salt
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Seepage
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium
Drainage: Deep to water
Irrigation: Slope, droughty, excess sodium
Terraces and diversions: Favorable

Range site: Jerval—027X028N; Trocken—027X028N; Golconda—027X028N

144—Beoska-Tenabo-Dun Glen association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,600 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Beoska very stony loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—40 percent
- Tenabo very cobbly very fine sandy loam, 8 to 15 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—35 percent
- Dun Glen very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—15 percent

Contrasting inclusions:
- Inclusion 1: Oxcord very stony very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—5 percent
- Inclusion 2: Trocken Variant very stony loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

Characteristics of the Beoska Soil

Position on landscape: The lower part of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravels, cobbles, stones; percentage of surface covered—32

Typical profile

0 to 13 inches—very stony loam; 15 to 30 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—SM; estimated AASHTO classification—A-4

13 to 25 inches—clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.7); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified
classification—CL; estimated AASHTO classification—A-6, A-7
25 to 44 inches—gravely sandy loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
44 to 60 inches—very gravely sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.0 to 8.3 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—0.24; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Tenabo Soil

Position on landscape: The upper part of fan piedmont remnants
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—20

Typical profile

0 to 5 inches—very cobbly very fine sandy loam; 30 to 50 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
5 to 17 inches—clay loam; 5 to 30 percent pebbles (by weight); prismatic structure; slightly hard, friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-6
17 to 24 inches—indurated duripan; massive; extremely hard, extremely firm
24 to 60 inches—extremely gravely loamy sand; 10 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 15 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—moderately slow
Available water capacity: 3.2 to 3.5 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—10; T value—1; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Characteristics of the Dun Glen Soil

Position on landscape: Fan skirts
Parent material:Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—plane
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Typical profile

0 to 3 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
3 to 10 inches—silt loam; 0 to 10 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
10 to 60 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4
mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—SM; estimated
AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60
inches
Flooding: Rare
Permeability: Moderate
Available water capacity: 6.8 to 8.0 inches
Water-supplying capacity: About 6 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.32; T value—
5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: The convex upper part of fan
piedmont remnants
Distinctive present vegetation: Shadscale, bud
sagebrush, bottlebrush squireltail

Inclusion 2
Position on landscape: Concave inset fans
Distinctive present vegetation: Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Beoska soil for named elements: Wild
herbaceous plants (nonirrigated)—very poor; shrubs
(nonirrigated)—very poor
Suitability of the Tenabo soil for named elements: Grain
and seed crops (irrigated)—poor; domestic grasses
and legumes (irrigated)—poor; wild herbaceous
plants (nonirrigated)—very poor; shrubs
(nonirrigated)—very poor
Suitability of the Dun Glen soil for named elements:
Grain and seed crops (irrigated)—good; domestic
grasses and legumes (irrigated)—good; wild
herbaceous plants (nonirrigated)—poor; shrubs
(nonirrigated)—poor

Ratings and restrictive features of the Beoska soil
for selected uses and practices

Range seeding: Poor—too arid, large stones, excess
salt
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight

Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, excess
sodium
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess salt,
excess sodium

Ratings and restrictive features of the Tenabo soil
for selected uses and practices

Range seeding: Poor—too arid, large stones, too crusty
Daily cover for landfill: Poor—cemented pan, seepage,
too sandy
Shallow excavations: Severe—cemented pan, cutbanks
cave
Local roads and streets: Severe—cemented pan
Roadfill: Poor—cemented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, excess
sodium
Pond reservoir areas: Severe—cemented pan, seepage,
slope
Embarkments, dikes, and levees: Severe—seepage,
excess salt, excess sodium
Drainage: Deep to water
Irrigation: Cemented pan, slope, drouthy
Terraces and diversions: Slope, large stones, cemented
pan

Ratings and restrictive features of the Dun Glen soil
for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—flooding
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones
Pond reservoir areas: Moderate—seepage
Embarkments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Soil blowing
Terraces and diversions: Erodes easily, soil blowing

Interpretable Groups

Capability classification: Beoska—VIls, nonirrigated;
Tenabo—IVs, irrigated, and VIIs, nonirrigated; Dun
Glen—IIlc, irrigated, and VIIc, nonirrigated
Range site: Beoska—024X002N; Tenabo—024X002N;
Dun Glen—024X002N
146—Beoska-Oxcorel-Whirlo association

Map Unit Setting

Position on landscape: Fan piedmonts, fan collars
Elevation: 4,500 to 5,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Beoska gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natargids, fine-loamy, mixed, mesic—35 percent
- Oxcorel gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natargids, fine, montmorillonitic, mesic—30 percent
- Whirlo very stony very fine sandy loam, 8 to 15 percent slopes—Typic Camborthods, loamy-skeletal, mixed, mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Xerollic Camborthods cobbly loam, 2 to 8 percent slopes—Xerollic Camborthods, loamy-skeletal, mixed, mesic—8 percent
- Inclusion 2: Typic Camborthods cobbly loam, 30 to 50 percent slopes—Typic Camborthods, loamy-skeletal, mixed, mesic—6 percent
- Inclusion 3: Bubus silt loam, 2 to 4 percent slopes—Duorothic Torriorthents, coarse-loamy, mixed (calcareous), mesic—1 percent

Characteristics of the Beoska Soil

Position on landscape: The lower part of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—32

Typical profile
0 to 13 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4
13 to 25 inches—clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.7); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
25 to 44 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
44 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.0 to 8.3 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Oxcorel Soil

Position on landscape: The upper part of fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—24

Typical profile
0 to 8 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4
8 to 34 inches—clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight);
prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

34 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

11 to 60 inches—very gravelly sandy loam; 5 to 30 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches

*Flooding:* None

*Permeability:* Very slow

*Available water capacity:* 6.1 to 8.0 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—high

*Potential for frost action:* Low

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* Channels and drainageways on narrow inset fans

*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 2**

*Position on landscape:* Short, concave back slopes of fan piedmont remnants

*Distinctive present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

**Inclusion 3**

*Position on landscape:* Toe slopes of fan skirts

*Distinctive present vegetation:* Black greasewood

**Major Uses**

*Current uses:* Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements**

*Suitability of the Beoska soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Oxcord soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Whirlo soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Beoska soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, excess salt, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess sodium, excess salt
Drainage: Deep to water
Irrigation: Slope, excess sodium, excess salt
Terraces and diversions: Erodes easily

Ratings and restrictive features of the Oxcorel soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, excess sodium, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Drainage: Deep to water
Irrigation: Percs slowly, slope, excess sodium
Terraces and diversions: Favorable

Ratings and restrictive features of the Whirlo soil for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—large stones, slope
Local roads and streets: Moderate—slope, large stones
Roadfill: Fair—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage

Interpretive Groups

Capability classification: Beoska—Ille, irrigated, and Vlls, nonirrigated; Oxcorel—IVe, irrigated, and Vlls, nonirrigated; Whirlo—Vlls, nonirrigated
Range site: Beoska—024X002N; Oxcorel—024X002N; Whirlo—024X002N

151—Blackhawk silt loam, 0 to 2 percent slopes

Map Unit Setting

Position on landscape: Fan piedmont remnants
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Blackhawk silt loam, 0 to 2 percent slopes—Entic Durorthids, loamy, mixed, mesic, shallow—85 percent
Contrasting include:
• Inclusion 1: Adelaide silt loam, 0 to 2 percent slopes—Entic Durorthids, loamy, mixed, mesic, shallow—7 percent
• Inclusion 2: Dun Glen silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—5 percent
• Inclusion 3: Golconda silt loam, 0 to 2 percent slopes—Haplic Noduarargids, fine-loamy, mixed, mesic—3 percent

Characteristics of the Blackhawk Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale bud sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel; percentage of surface covered—5

Typical profile

0 to 3 inches—silt loam; 0 to 5 percent cobbles and stones and 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
3 to 14 inches—silt loam; 0 to 5 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—ML; estimated AASHTO classification—A-4
14 to 30 inches—cemented layer; platy structure; very hard, very firm
30 to 48 inches—gravelly loamy coarse sand; 25 to 30 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—SM; estimated AASHTO classification—A-1
48 to 60 inches—very gravelly coarse sand; 50 to 60 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—GP-GM, GW-GM; estimated AASHTO classification—A-1

Soil and water features

**Depth to a hardpan:** 12 to 20 inches
**Depth to a seasonal high water table:** More than 60 inches
**Flooding:** None
**Permeability:** Above the cemented layer—moderate; below the cemented layer—rapid
**Available water capacity:** 3.6 to 4.1 inches
**Water-supplying capacity:** About 6 inches
**Runoff:** Very slow
**Hydrologic group:** D
**Erosion factors (surface layer):** K value—.55; T value—1; wind erodibility group—5
**Hazard of erosion:** By water—slight; by wind—slight
**Shrink-swell potential:** Low
**Corrosivity:** To steel—high; to concrete—low
**Potential for frost action:** Low

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* Slightly concave fan piedmont remnants
*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 2**
*Position on landscape:* Fan skirts adjacent to alluvial flats
*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 3**
*Position on landscape:* The upper part of fan piedmont remnants adjacent to mountain foot slopes
*Distinctive present vegetation:* Shadscale, bud sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat
**Foreseeable uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements**

**Suitability of the Blackhawk soil for named elements:**
- Grain and seed crops (irrigated)—poor
- Domestic grasses and legumes (irrigated)—poor
- Wild herbaceous plants (nonirrigated)—poor
- Shrubs (nonirrigated)—poor

**Ratings and restrictive features of the Blackhawk soil for selected uses and practices**

**Range seeding:** Poor—too crusty, too arid
**Daily cover for landfill:** Poor—cemented pan
**Shallow excavations:** Severe—cemented pan, cutbanks cave
**Local roads and streets:** Moderate—cemented pan
**Roadfill:** Good
**Sand:** Probable source
**Gravel:** Probable source
**Topsoil:** Poor—cemented pan, area reclaim
**Pond reservoir areas:** Severe—seepage, cemented pan
**Embankments, dikes, and levees:** Severe—seepage, excess salt
**Drainage:** Deep to water
**Irrigation:** Cemented pan
**Terraces and diversions:** Cemented pan, erodes easily

**Interpretive Groups**

**Capability classification:** IVs, irrigated, and VII, nonirrigated
**Range site:** 024X002N

**161—Bliss-Chiara association, sloping**

**Map Unit Setting**

**Position on landscape:** Fan piedmont remnants
**Elevation:** 4,000 to 5,000 feet
**Average annual precipitation:** About 9 inches
**Average annual air temperature:** About 48 degrees F
**Frost-free period:** About 110 days

**Composition**

**Major components:**
- Bliss fine sandy loam, 8 to 15 percent slopes—Haploxerollic Durothids, coarse-loamy, mixed, mesic—45 percent
- Chiara fine sandy loam, 15 to 30 percent slopes—Xerollic Durothids, loamy, mixed, mesic, shallow—40 percent
Contrasting inclusions:
- Inclusion 1: Durixerollic Camborthids fine sandy loam, 8 to 15 percent slopes—Durixerollic Camborthids, coarse-silty, mixed, mesic—10 percent
- Inclusion 2: Shabiss very fine sandy loam, 15 to 30 percent slopes—Haploxeorollic Durorthids, loamy, mixed, mesic, shallow—5 percent

**Characteristics of the Bliss Soil**

*Position on landscape*: North-facing back slopes of fan piedmont remnants  
*Parent material*: Loess over mixed alluvium  
*Slope features*: Length—long; shape—convex  
*Dominant present vegetation*: Wyoming big sagebrush

**Typical profile**

0 to 3 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

3 to 11 inches—very fine sandy loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

11 to 21 inches—very fine sandy loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

21 to 45 inches—cemented layer; platy structure; very hard, very firm

**Soil and water features**

*Depth to a hardpan*: 10 to 20 inches  
*Depth to a seasonal high water table*: More than 60 inches  
*Flooding*: None  
*Permeability*: Above the duripan—moderate  
*Available water capacity*: 2.3 to 2.7 inches  
*Water-supplying capacity*: About 7 inches  
*Runoff*: Medium  
*Hydrologic group*: C  
*Erosion factors (surface layer)*: K value—0.37; T value—1; wind erodibility group—3

**Hazard of erosion**: By water—moderate; by wind—moderate  
**Shrink-swell potential**: Low  
**Corrosivity**: To steel—high; to concrete—low  
**Potential for frost action**: Moderate

**Characteristics of the Chiara Soil**

*Position on landscape*: South-facing back slopes of fan piedmont remnants  
*Parent material*: Loess over mixed alluvium  
*Slope features*: Length—long; shape—convex  
*Dominant present vegetation*: Wyoming big sagebrush

**Typical profile**

0 to 4 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

4 to 15 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 inches—indurated duripan; massive; extremely hard, extremely firm

**Soil and water features**

*Depth to a hardpan*: 10 to 20 inches  
*Depth to a seasonal high water table*: More than 60 inches  
*Flooding*: None  
*Permeability*: Above the duripan—moderate  
*Available water capacity*: 2.3 to 2.7 inches  
*Water-supplying capacity*: About 7 inches  
*Runoff*: Medium  
*Hydrologic group*: D  
*Erosion factors (surface layer)*: K value—0.37; T value—1; wind erodibility group—3

**Hazard of erosion**: By water—severe; by wind—moderate  
**Shrink-swell potential**: Low  
**Corrosivity**: To steel—high; to concrete—low  
**Potential for frost action**: Moderate

**Contrasting Inclusions**

*Inclusion 1*

*Position on landscape*: Concave foot slopes of fan piedmont remnants  
*Distinctive present vegetation*: Black greasewood, basin big sagebrush

*Inclusion 2*

*Position on landscape*: Convex shoulder slopes of fan piedmont remnants  
*Distinctive present vegetation*: Wyoming big sagebrush

**Major Uses**

*Current uses*: Rangeland, wildlife habitat
Wildlife habitat elements

Suitability of the Bliss soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Chiara soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Bliss soil for selected uses and practices

Range seeding: Fair—too arid
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Moderate—cemented pan, slope, frost action
Roadfill: Poor—cemented pan
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—cemented pan, small stones, slope
Pond reservoir areas: Severe—slope
Embarkments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Soil blowing, cemented pan, slope
Terraces and diversions: Slope, cemented pan, erodes easily

Ratings and restrictive features of the Chiara soil for selected uses and practices

Range seeding: Poor—droughty, erodes easily
Daily cover for landfill: Poor—cemented pan, slope
Shallow excavations: Severe—cemented pan, slope
Local roads and streets: Severe—cemented pan, slope
Roadfill: Poor—cemented pan
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan, slope
Pond reservoir areas: Severe—cemented pan, slope
Embarkments, dikes, and levees: Severe—piping

Interpretive Groups

Capability classification: Bliss—IVe, irrigated, and VIs, nonirrigated; Chiara—VIs, nonirrigated
Range site: Bliss—024X020N; Chiara—024X005N

Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Bliss fine sandy loam, 15 to 30 percent slopes—Haploxerollic Durorthids, coarse-loamy, mixed, mesic—50 percent
- Chiara fine sandy loam, 2 to 8 percent slopes—Xerolic Durorthids, loamy, mixed, mesic—35 percent

Contrasting inclusions:
- Inclusion 1: Goldrun fine sand, 15 to 30 percent slopes—Xeric Torripsamments, mixed, mesic—5 percent
- Inclusion 2: Rebel loam, 2 to 8 percent slopes—Xerolic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Sodhouse cobbly loam, 15 to 30 percent slopes—Typic Durothids, loamy, mixed, mesic, shallow—5 percent

Characteristics of the Bliss Soil

Position on landscape: Back slopes of fan piedmont remnants
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, bottlebrush squirreltail, spiny hopsage

Typical profile

0 to 3 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4
3 to 11 inches—very fine sandy loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
11 to 21 inches—very fine sandy loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
21 to 45 inches—cemented layer; platy structure; very hard, very firm

Soil and water features

Depth to a hardpan: 20 to 36 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—moderate
Available water capacity: 4.0 to 4.9 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (surface layer): K value—.37; T value—2; wind erodibility group—3
Hazard of erosion: By water—severe; by wind—moderate
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

**Characteristics of the Chiara Soil**

**Position on landscape:** Summits of fan piedmont remnants

**Parent material:** Loess over mixed alluvium

**Slope features:** Length—long; shape—convex

**Dominant present vegetation:** Wyoming big sagebrush, bottlebrush squirreltail

**Typical profile**

0 to 4 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

4 to 15 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 inches—indurated duripan; massive; extremely hard, extremely firm

**Soil and water features**

Depth to a hardpan: 10 to 20 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Above the duripan—moderate

Available water capacity: 2.3 to 2.7 inches

Water-supplying capacity: About 7 inches

Runoff: Medium

Hydrologic group: D

Erosion factors (surface layer): K value—.37; T value—1; wind erodibility group—3

Hazard of erosion: By water—slight; by wind—moderate

Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low

**Potential for frost action:** Moderate

**Contrasting Inclusions**

**Inclusion 1**

**Position on landscape:** The concave lower part of back slopes on fan piedmont remnants

**Distinctive present vegetation:** Basin big sagebrush

**Inclusion 2**

**Position on landscape:** Concave inset fans

**Distinctive present vegetation:** Wyoming big sagebrush

**Inclusion 3**

**Position on landscape:** Convex, south-facing back slopes of fan piedmont remnants

**Distinctive present vegetation:** Shadscale

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements**

**Suitability of the Bliss soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Suitability of the Chiara soil for named elements:** Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the Bliss soil for selected uses and practices**

**Range seeding:** Fair—too arid, erodes easily

**Daily cover for livestock:** Poor—cemented pan, slope

**Shallow excavations:** Severe—cemented pan, slope

**Local roads and streets:** Severe—slope

**Roadfill:** Poor—cemented pan

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Topsoil:** Poor—slope

**Pond reservoir areas:** Severe—slope

**Embankments, dikes, and levees:** Severe—piping

**Ratings and restrictive features of the Chiara soil for selected uses and practices**

**Range seeding:** Poor—droughty

**Daily cover for livestock:** Poor—cemented pan

**Shallow excavations:** Severe—cemented pan

**Local roads and streets:** Severe—cemented pan

**Roadfill:** Poor—cemented pan

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Topsoil:** Poor—cemented pan

**Pond reservoir areas:** Severe—cemented pan

**Embankments, dikes, and levees:** Severe—piping

**Drainage:** Deep to water

**Irrigation:** Soil blowing, cemented pan, slope
Terraces and diversions: Cemented pan, erodes easily

**Interpretive Groups**

**Capability classification:** Bliss—Vle, nonirrigated; Chiara—IVe, irrigated, and Vls, nonirrigated

**Range site:** Bliss—024X020N; Chiara—024X005N

170—Shabliss-Enko-Valmy association

**Map Unit Setting**

**Position on landscape:** Fan piedmonts

**Elevation:** 4,000 to 5,500 feet

**Average annual precipitation:** About 8 inches

**Average annual air temperature:** About 48 degrees F

**Frost-free period:** About 110 days

**Composition**

**Major components:**
- Shabliss very fine sandy loam, 2 to 8 percent slopes—Haploxerolic Durorthids, loamy, mixed, mesic, shallow—40 percent
- Enko fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—25 percent
- Valmy fine sandy loam, 2 to 8 percent slopes—Durothic Torriorthents, coarse-loamy, mixed (calcareous), mesic—20 percent

**Contrasting inclusions:**
- Inclusion 1: Goldrun fine sand, 4 to 30 percent slopes—Xeric Torripsamments, mixed, mesic—5 percent
- Inclusion 2: Xeric Torriorthents cobbly loam, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 3: Chiara fine sandy loam, 2 to 8 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—5 percent

**Characteristics of the Shabliss Soil**

**Position on landscape:** Fan piedmont remnants

**Parent material:** Mixed alluvium influenced by loess and volcanic ash over mixed alluvium

**Slope features:** Length—long; shape—convex

**Dominant present vegetation:** Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

**Typical profile**

- 3 to 19 inches—loam; 0 to 5 percent cobbles and stones and 0 to 5 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 19 to 30 inches—cemented layer; massive; very hard, very firm
- 30 to 60 inches—very gravelly loamy sand; 0 to 5 percent cobbles and stones and 20 to 40 percent pebbles (by weight); massive; loose; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1

**Soil and water features**

**Depth to a hardpan:** 12 to 20 inches

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Above the hardpan—moderate

**Available water capacity:** 3.6 to 4.6 inches

**Water-supplying capacity:** About 7 inches

**Runoff:** Medium

**Hydrologic group:** D

**Erosion factors (surface layer):** K value—55; T value—2; wind erodibility group—3

**Hazard of erosion:** By water—slight; by wind—slight

**Shrink-swell potential:** Low

**Corrosivity:** To steel—high; to concrete—low

**Potential for frost action:** Moderate

**Characteristics of the Enko Soil**

**Position on landscape:** Fan aprons

**Parent material:** Mixed alluvium

**Slope features:** Length—long; shape—convex

**Dominant present vegetation:** Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

**Typical profile**

- 0 to 6 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4
- 6 to 29 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4
29 to 60 inches—sandy loam; 0 to 25 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-2, A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 6.5 to 8.8 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—moderate
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Valmy Soil

Position on landscape: Inset fans
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Black greasewood, basin big sagebrush
Rock fragments on the surface: Kind—gravel; percentage of surface covered—10

Typical profile

0 to 3 inches—fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 20 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-2, A-4
3 to 60 inches—stratified very fine sandy loam to gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2, A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 9.0 to 10.2 inches
Water-supplying capacity: About 7 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.32; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—moderate
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Sand dunes
Distinctive present vegetation: Indian ricegrass, basin big sagebrush

Inclusion 2
Position on landscape: Narrow drainageways on fan piedmont remnants
Distinctive present vegetation: Bottlebrush squirreltail, Wyoming big sagebrush

Inclusion 3
Position on landscape: The convex upper part of fan piedmont remnants
Distinctive present vegetation: Thruber needlegrass, Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Shabbliss soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Enko soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Valmy soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Shabbliss soil for selected uses and practices

Range seeding: Poor—droughty
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Moderate—cemented pan, frost action
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan
Pond reservoir areas: Severe—seepage, cemented pan
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Cemented pan, slope
Terraces and diversions: Cemented pan, erodes easily

180—Chiara stony very fine sandy loam, 2 to 4 percent slopes

Map Unit Setting

Position on landscape: Fan piedmont remnants
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days

Composition

Major component:
- Chiara stony very fine sandy loam, 2 to 4 percent slopes—Xerollic Durorthids, loamy, mixed, mesic, shallow—85 percent

Contrasting inclusions:
- Inclusion 1: Haploxerolic Durorthids stony very fine sandy loam, 2 to 4 percent slopes—Haploxerolic Durorthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Durixerollic Camborthids very fine sandy loam, 2 to 4 percent slopes—Durixerollic Camborthids, coarse-silty, mixed, mesic—5 percent
- Inclusion 3: Haploxerolic Durorthids stony very fine sandy loam, 2 to 4 percent slopes—Haploxerolic Durorthids, loamy, mixed, mesic, shallow—5 percent

Characteristics of the Chiara Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium influenced by loess and volcanic ash

Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, horsebrush, Sandberg bluegrass, bottlebrush squirreltail

Rock fragments on the surface: Kind—gravel, stones; percentage of surface covered—7

Typical profile

0 to 4 inches—stony very fine sandy loam; 20 to 35 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

4 to 15 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 5 to 15 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

15 inches—indurated layer; massive; extremely hard, extremely firm

Interpretive Groups

Capability classification: Shabliss—IVe, irrigated, and VIs, nonirrigated; Enko—IVe, irrigated, and VIs, nonirrigated; Valmy—IIIe, irrigated, and VIIc, nonirrigated

Range site: Shabliss—024X020N; Enko—024X020N; Valmy—024X022N
Soil and water features

Depth to a hardpan: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 2.3 to 2.7 inches
Water-supplying capacity: About 7 inches
Runoff: Slow
Hydrologic group: D
Erosion factors (surface layer): K value—.32; T value—1; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: The convex upper part of fan piedmont remnants
Distinctive present vegetation: Spiny hopsage

Inclusion 2
Position on landscape: Concave inset fans adjacent to drainageways
Distinctive present vegetation: Basin big sagebrush

Inclusion 3
Position on landscape: The convex lower part of fan piedmont remnants
Distinctive present vegetation: Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Chiara soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Chiara soil for selected uses and practices

Range seeding: Poor—small stones, droughty
Daily cover for landill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—cemented pan
Roadfill: Poor—cemented pan
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan, large stones
Pond reservoir areas: Severe—cemented pan
Embankments, dikes, and levees: Severe—piping, thin layer

Interpretive Groups

Capability classification: VII, nonirrigated

Range site: 024X005N

190—Theon-Singatse-Rock outcrop association

Map Unit Setting

Position on landscape: Foothills, hills
Elevation: 4,300 to 5,000 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 120 days

Composition

Major components:
- Theon very cobbly loam, 30 to 50 percent slopes—Lithic Haplargids, loamy-skeletal, mixed, mesic—35 percent
- Singatse extremely cobbly loam, 50 to 75 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—35 percent
- Rock outcrop—15 percent

Contrasting inclusions:
- Inclusion 1: Trocken very cobbly loam, 4 to 15 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—7 percent
- Inclusion 2: Theon extremely cobbly loam, 4 to 15 percent slopes—Lithic Haplargids, loamy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Entic Durorthids very cobbly loam, 30 to 50 percent slopes—Entic Durorthids, loamy-skeletal, mixed, mesic—2 percent
- Inclusion 4: Lithic Xerolic Haplargids very cobbly loam, 30 to 50 percent slopes—Lithic Xerolic Haplargids, loamy-skeletal, mixed, mesic—1 percent

Characteristics of the Theon Soil

Position on landscape: Back slopes of foothills
Parent material: Kind—residuum; source—andesite, rhyolite, quartzite

Slope features: Length—long; shape—plane to concave
Dominant present vegetation: Shadscale, Bailey greasewood, spiny hopsage, Indian ricegrass, Nevada ephedra, littleleaf horsebrush

Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—35

Typical profile

0 to 3 inches—very cobbly loam; 35 to 55 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GM,
SM-SC, SM; estimated AASHTO classification—A-2, A-4

3 to 8 inches—very gravelly sandy clay loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2

8 to 10 inches—weathered bedrock
10 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 8 to 14 inches
*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Moderately slow
*Available water capacity:* 0.7 to 0.8 inch
*Water-supplying capacity:* About 3 inches
*Runoff:* Rapid
*Hydrologic group:* D
*Erosion factors (surface layer):* K value—17; T value—1; wind erodibility group—7
*Hazard of erosion:* By water—severe; by wind—slight
*Shrink-swell potential:* Moderate
*Corrosivity:* To steel—high; to concrete—low
*Potential for frost action:* Low

**Characteristics of the Singatse Soil**

*Position on landscape:* Side slopes of hills
*Parent material:* Kind—residuum; source—andesite, rhyolite, dacite, granite
*Slope features:* Length—long; shape—plane
*Dominant present vegetation:* Shadscale, Bailey greasewood, bud sagebrush, Indian ricegrass
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—80

**Typical profile**

0 to 4 inches—extremely cobbly loam; 40 to 50 percent cobbles and stones and 65 to 75 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

4 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

8 to 15 inches—weathered bedrock
15 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 4 to 10 inches
*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Moderate
*Available water capacity:* 0.7 to 1.0 inch
*Water-supplying capacity:* About 3 inches
*Runoff:* Very rapid
*Hydrologic group:* D
*Erosion factors (surface layer):* K value—15; T value—1; wind erodibility group—8
*Hazard of erosion:* By water—slight; by wind—severe
*Shrink-swell potential:* Low
*Corrosivity:* To steel—high; to concrete—low
*Potential for frost action:* Low

**Characteristics of the Rock Outcrop**

*Position on landscape:* Crests, shoulder slopes, and back slopes of foothills
*Dominant present vegetation:* Barren

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* Concave foot slopes and toe slopes of foothills
*Distinctive present vegetation:* Shadscale, bud sagebrush, bluegrass

**Inclusion 2**
*Position on landscape:* Convex crests of foothills
*Distinctive present vegetation:* Shadscale, Bailey greasewood, bluegrass

**Inclusion 3**
*Position on landscape:* Concave back slopes of foothills
*Distinctive present vegetation:* Shadscale, Bailey greasewood, bluegrass

**Inclusion 4**
*Position on landscape:* Concave, north-facing back slopes of foothills
*Distinctive present vegetation:* Black sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Theon soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Singatse soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Ratings and restrictive features of the Theon soil for selected uses and practices

Range seeding: Poor—too arid, small stones, erodes easily
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Singatse soil for selected uses and practices

Range seeding: Poor—too arid, droughty, erodes easily
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, slope, small stones
Pond reservoir areas: Severe—slope, depth to bedrock
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Theon—VIII, nonirrigated;
Singatse—VIII, nonirrigated; Rock outcrop—VIII
Range site: Theon—027X019N; Singatse—027X027N

191—Theon-Singatse association

Map Unit Setting

Position on landscape: Foothills, mountains
Elevation: 4,200 to 5,500 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 120 days

Composition

Major components:
- Theon very cobbly loam, 30 to 50 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—5 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Theon very cobbly loam, 4 to 15 percent slopes—Lithic Haplargids, loamy-skeletal, mixed, mesic—3 percent
- Inclusion 4: Lithic Xeric Torriorthents very cobbly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy, mixed, mesic—2 percent

Characteristics of the Theon Soil

Position on landscape: North- and east-facing back slopes of foothills
Parent material: Kind—residuum; source—andesite, rhyolite, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, Bailey greasewood, spiny hopsage, Indian ricegrass, Nevada ephedra, littleleaf horsebrush
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—35

Typical profile

0 to 3 inches—very cobbly loam; 35 to 55 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GM-SC, SM; estimated AASHTO classification—A-2, A-4

3 to 8 inches—very gravelly sandy clay loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2

8 to 10 inches—weathered bedrock
10 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 8 to 14 inches
Depth to a seasonal high water table: More than 60 inches

Floodling: None
Permeability: Moderately slow
Available water capacity: 0.7 to 0.8 inch
Water-supplying capacity: About 3 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

**Characteristics of the Singatse Soil**

Position on landscape: South- and west-facing side slopes of hills
Parent material: Kind—residuum; source—andesite, rhyolite, dacite, granite
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, Bailey
Greasewood, bud sagebrush, Indian ricegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—80

**Typical profile**

0 to 4 inches—extremely cobbly loam; 40 to 50 percent cobbles and stones and 65 to 75 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
4 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
8 to 15 inches—weathered bedrock
15 inches—unweathered bedrock

**Soil and water features**

Depth to bedrock: 4 to 10 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 0.7 to 1.0 inch
Water-supplying capacity: About 3 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—15; T value—1; wind erosionability group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

**Contrasting Inclusions**

**Inclusion 2**

Position on landscape: Scattered small peaks and ridges
Distinctive present vegetation: Barren

**Inclusion 3**

Position on landscape: Convex crests of mountains
Distinctive present vegetation: Shadscale, Bailey
Greasewood, Indian ricegrass

**Inclusion 4**

Position on landscape: Concave, north-facing back slopes of mountains
Distinctive present vegetation: Black sagebrush

**Major Uses**

Current uses: Rangeland, wildlife habitat

**Wildlife habitat elements**

Suitability of the Theon soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Singatse soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings and restrictive features of the Theon soil for selected uses and practices**

Range seeding: Poor—too arid, small stones, erodes easily

**Daily cover for landfill:** Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope

Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

**Ratings and restrictive features of the Singatse soil for selected uses and practices**

Range seeding: Poor—too arid, droughty, erodes easily
**Daily cover for landfill:** Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope

Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, slope, small stones
Pond reservoir areas: Severe—slope, depth to bedrock
Embankments, dikes, and levees: Severe—thin layer


Interpretive Groups
Capability classification: Theon—VIIa, nonirrigated; Singats—VIIa, nonirrigated
Range site: Theon—027X019N; Singats—027X027N

201—Piouette-Rezave-Rubble land association

Map Unit Setting
Position on landscape: Summits of plateaus, side slopes of plateaus and hills
Elevation: 4,500 to 5,500 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 120 days

Composition
Major components:
• Piouette very stony very fine sandy loam, 4 to 15 percent slopes—Typic Natrargids, loamy-skeletal, mixed, mesic, shallow—45 percent
• Rezave extremely stony very fine sandy loam, 30 to 50 percent slopes—Lithic Natrargids, clayey, montmorillonitic, mesic—20 percent
• Rubble land—20 percent
Contrasting inclusions:
• Inclusion 1: Singats very cobbly loam, 50 to 75 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—8 percent
• Inclusion 2: Xerollic Haplumbids, very cobbly loam, 30 to 50 percent slopes—Xerollic Haplumbids, clayey-skeletal, montmorillonitic, mesic—6 percent
• Inclusion 3: Alov very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Haplumbids, loamy-skeletal, mixed, mesic—1 percent

Characteristics of the Piouette Soil
Position on landscape: Summits of plateaus
Parent material: Kind—residual; source—tuff, igneous rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscake, bud sagebrush, bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—45

Typical profile
0 to 4 inches—very stony very fine sandy loam; 35 to 50 percent cobbles and stones and 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-4
4 to 14 inches—very cobbly clay loam; 30 to 40 percent cobbles and stones and 35 to 50 percent pebbles (by weight); strongly alkaline (pH 9.0); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6, A-7
14 to 16 inches—indurated layer
16 inches—unweathered bedrock

Soil and water features
Depth to a hardpan: 11 to 20 inches
Depth to bedrock: 12 to 23 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.1 to 1.4 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Characteristics of the Rezave Soil
Position on landscape: Side slopes of plateaus
Parent material: Kind—residual; source—basalt
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscake, bud sagebrush, Bailey greasewood, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—55

Typical profile
0 to 3 inches—extremely stony very fine sandy loam; 35 to 45 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4
3 to 14 inches—stony clay; 5 to 30 percent cobbles and stones and 0 to 10 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
14 to 16 inches—gravely clay loam; 5 to 10 percent cobbles and stones and 30 to 50 percent pebbles (by weight); massive; hard, firm; very strongly alkaline (pH 9.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SC, CL; estimated AASHTO classification—A-7
16 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 1.7 to 2.1 inches
Water-supplying capacity: About 5 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—8
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Rubble Land

Position on landscape: Side slopes of plateaus
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly convex side slopes of plateaus
Distinctive present vegetation: Desert needlegrass

Inclusion 2
Position on landscape: Concave, north-facing side slopes of plateaus
Distinctive present vegetation: Wyoming big sagebrush

Inclusion 3
Position on landscape: Convex, north-facing side slopes of plateaus
Distinctive present vegetation: Black sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Rezave soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Pirouette soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Pirouette soil for selected uses and practices

Range seeding: Poor—too arid, excess sodium, droughty
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, cemented pan
Local roads and streets: Severe—depth to bedrock
Roadfill: Poor—depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, cemented pan, slope
Embankments, dikes, and levees: Severe—seepage, large stones, excess sodium

Ratings and restrictive features of the Rezave soil for selected uses and practices

Range seeding: Poor—too arid, excess sodium, droughty
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, large stones, too clayey
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—excess sodium

Interpretive Groups

Capability classification: Pirouette—VII, nonirrigated; Rezave—VII, nonirrigated; Rubble land—VIII
Range site: Pirouette—027X028N; Rezave—027X030N

211—Preble Variant-Whirlo association

Map Unit Setting

Position on landscape: Fan piedmonts, alluvial flats
Elevation: 4,500 to 4,700 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Preble Variant very fine sandy loam, 2 to 8 percent slopes—Aquic Durorthic Torriorthents, fine-loamy,
mixed (calcareous), mesic—55 percent

- Whirlo very fine sandy loam, 2 to 8 percent slopes—
  Typic Camborthids, loamy-skeletal, mixed, mesic—35 percent

**Contrasting inclusions:**

- Inclusion 1: Wendane silt loam, drained, 2 to 8 percent slopes—
  Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Weso very stony very fine sandy loam, moderately saline-sodic, 2 to 8 percent slopes—
  Duric Camborthids, coarse-loamy, mixed, mesic—5 percent

**Characteristics of the Preble Variant Soil**

**Position on landscape:** Alluvial flats

**Parent material:** Mixed alluvium and lake sediments containing pyroclastic material

**Slope features:** Length—long; shape—concave

**Dominant present vegetation:** Black greasewood, basin big sagebrush, basin wildrye, shadscale

**Rock fragments on the surface:** Kind—gravel; percentage of surface covered—7

**Typical profile**

0 to 5 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

5 to 60 inches—stratified sandy clay loam to gravelly loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); massive; slightly hard, friable; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SC, CL; estimated AASHTO classification—A-2, A-6

**Soil and water features**

**Depth to a seasonal high water table:** February through June—42 to 60 inches; rest of year—more than 60 inches

**Flooding:** None

**Permeability:** Moderately slow

**Available water capacity:** 3.9 to 5.1 inches

**Water-supplying capacity:** About 6 inches

**Runoff:** Slow

**Hydrologic group:** B

**Erosion factors (surface layer):** K value—.43; T value—5; wind erodibility group—3

**Hazard of erosion:** By water—moderate; by wind—slight

**Shrink-swell potential:** Low

**Corrosivity:** To steel—high; to concrete—low

**Potential for frost action:** Low

**Contrasting Inclusions**

**Inclusion 1**

**Position on landscape:** Seeps adjacent to fault lines

**Distinctive present vegetation:** Torrey quailbush

**Inclusion 2**

**Position on landscape:** Convex fan skirts adjacent to fan piedmonts
**Interpretive Groups**

**Capability classification:** Preble Variant—IVw, irrigated, and Vlw, nonirrigated; Whirlo—Illc, irrigated, and VIlc, nonirrigated  
**Range site:** Preble Variant—024X022N; Whirlo—024X002N

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**220—Duffer silty clay loam**

**Map Unit Setting**

- **Position on landscape:** Alluvial flats  
- **Elevation:** 4,000 to 4,500 feet  
- **Average annual precipitation:** About 8 inches  
- **Average annual air temperature:** About 48 degrees F  
- **Frost-free period:** About 110 days

**Composition**

- **Major component:** Duffer silty clay loam, 0 to 2 percent slopes—Aquic Calcic-hydric, fine-silty, calcareous, mesic—85 percent  
- **Contrasting inclusions:**  
  - **Inclusion 1:** Aeric Halaquepts silty clay loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent  
  - **Inclusion 2:** Aeric Halaquepts silty clay loam, 0 to 2 percent slopes—Aeric Halaquepts, fine, montmorillonitic (calcareous), mesic—4 percent  
  - **Inclusion 3:** Preble silt loam, strongly saline-sodic, 0 to 2 percent slopes—Aquic Durorthid Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent  
  - **Inclusion 4:** Batan silt loam, 0 to 2 percent slopes—Durorthid Torriorthents, fine-silty, mixed (calcareous), mesic—3 percent

**Characteristics of the Duffer Soil**

- **Position on landscape:** Alluvial flats  
- **Parent material:** Mixed lake sediments, loess, and alluvium  
- **Slope features:** Length—long; shape—slightly convex  
- **Dominant present vegetation:** Alkali sacaton, inland saltgrass, rabbitbrush

**Typical profile**

- 0 to 16 inches—silty clay loam; platy structure; hard, friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL; estimated AASHTO classification—A-6  
- 16 to 72 inches or more—silty clay loam; massive; very hard, firm; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
Soil and water features

Depth to a seasonal high water table: February through June—18 to 36 inches; rest of year—more than 60 inches
Flooding: Rare
Permeability: Moderately slow
Available water capacity: 11.0 to 12.0 inches
Water-supplying capacity: About 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly concave alluvial flats
Distinctive present vegetation: Basin wildrye

Inclusion 2
Position on landscape: Slightly concave areas in channels
Distinctive present vegetation: Black greasewood

Inclusion 3
Position on landscape: Slightly convex areas in channels
Distinctive present vegetation: Black greasewood

Inclusion 4
Position on landscape: Slightly convex lake plain terraces adjacent to fan skirts
Distinctive present vegetation: Shadscale, black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Duffer soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

Ratings and restrictive features of the Duffer soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too arid
Daily cover for landfill: Fair—wetness
Shallow excavations: Severe—wetness
Local roads and streets: Severe—low strength, frost action
Roadfill: Fair—low strength, wetness, shrink-swell
Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—wetness, excess salt

Interpretive Groups

Capability classification: VIIIw, nonirrigated
Range site: 024X010N

221—Duffer silty clay loam, occasionally flooded, slightly saline

Map Unit Setting

Position on landscape: Alluvial flats
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Duffer silty clay loam, occasionally flooded, slightly saline, 0 to 2 percent slopes—Aquic Calcixeralfs, fine-silty, carbonatic, mesic—85 percent

Contrasting inclusions:
• Inclusion 1: Needle Peak silt loam, 0 to 2 percent slopes—Aquic Torriorthents, fine-silty, mixed (calcareous), mesic—4 percent
• Inclusion 2: Aeric Halaquepts clay loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—4 percent
• Inclusion 3: Aeric Halaquepts silty clay loam, 0 to 2 percent slopes—Aeric Halaquepts, fine, montmorillonitic (calcareous), mesic—4 percent
• Inclusion 4: Preble silt loam, 0 to 2 percent slopes—Aquic Durorthid Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent

Characteristics of the Duffer Soil

Position on landscape: Alluvial flats
Parent material: Mixed lake sediments, loess, and alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Aklaki sacaton, basin wildrye, silver buffalograss

Typical profile

0 to 16 inches—silty clay loam; platy structure; hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6
16 to 72 inches—silty clay loam; massive; very hard,
firm; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

Soil and water features

Depth to a seasonal high water table: January through June—18 to 36 inches; rest of year—more than 60 inches
Flooding: Frequency—occasional; duration—very brief; months—January through June
Permeability: Moderately slow
Available water capacity: 11.0 to 12.0 inches
Water-supplying capacity: About 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Contrasting Inclusions

Inclusion 1
Position on landscape: The slightly concave upper part of alluvial flats
Distinctive present vegetation: Basin big sagebrush

Inclusion 2
Position on landscape: The slightly concave lower part of alluvial flats
Distinctive present vegetation: Alkali sacaton, alkali muhly

Inclusion 3
Position on landscape: Slightly concave drainageways
Distinctive present vegetation: Black greasewood

Inclusion 4
Position on landscape: Alluvial flats
Distinctive present vegetation: Black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Duffer soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Duffer soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too crusty
Daily cover for landfill: Fair—wetness
Shallow excavations: Severe—wetness

Local roads and streets: Severe—low strength, flooding, frost action
Roadfill: Fair—low strength, wetness, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—wetness, excess salt

Interpretive Groups

Capability classification: Vllw, nonirrigated
Range site: 024X009N

231—Dun Glen very fine sandy loam, 2 to 4 percent slopes

Map Unit Setting

Position on landscape: Fan skirts
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Dun Glen very fine sandy loam, 2 to 4 percent slopes—Typic Camborthods, coarse-loamy, mixed, mesic—90 percent
Contrasting inclusions:
• Inclusion 1: Yipor silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed, mesic—5 percent
  • Inclusion 2: Whirlo loam, 0 to 2 percent slopes—Typic Camborthods, loamy-skeletal, mixed, mesic—5 percent

Characteristics of the Dun Glen Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Typical profile

0 to 3 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
3 to 10 inches—silt loam; 0 to 10 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less
than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated
AASHTO classification—A-4
10 to 60 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated
AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches

Flooding: Rare
Permeability: Moderate
Available water capacity: 6.8 to 8.0 inches
Water-supplying capacity: About 6 inches
Runoff: Slow

Hydrologic group: B
Erosion factors (surface layer): K value—0.32; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Fan skirts adjacent to alluvial flats
Distinctive present vegetation: Shadscale, black greasewood

Inclusion 2
Position on landscape: Areas adjacent to channels
Distinctive present vegetation: Shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Dun Glen soil for named elements:
Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Dun Glen soil for selected uses and practices

Range seeding: Poor—too crusty, too arid
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—flooding

Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Soil blowing, slope
Terraces and diversions: Erodes easily, soil blowing

Interpretive Groups

Capability classification: Ile, irrigated, and VIIc, nonirrigated
Range site: 024X002N

233—Dun Glen very fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

Position on landscape: Fan skirts
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Dun Glen very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mésic—90 percent
Contrasting inclusions:
• Inclusion 1: Yipor silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mésic—5 percent
• Inclusion 2: Whirlo loam, 0 to 2 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mésic—4 percent
• Inclusion 3: Dun Glen silt loam, frequently flooded, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mésic—1 percent

Characteristics of the Dun Glen Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Typical profile

0 to 3 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—ML; estimated AASHTO classification—A-4
3 to 10 inches—silt loam; 0 to 10 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
10 to 60 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: Rare
Permeability: Moderate
Available water capacity: 6.8 to 8.0 inches
Water-supplying capacity: About 6 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—0.32; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly concave fan skirts adjacent to alluvial flats
Distinctive present vegetation: Black greasewood

Inclusion 2
Position on landscape: Slightly concave, narrow drainageways on fan skirts
Distinctive present vegetation: Shadscale, bottlebrush squirreltail

Inclusion 3
Position on landscape: The slightly concave lower part of fan skirts
Distinctive present vegetation: Winterfat

Major Uses

Current uses: Rangeland, wildlife habitat
Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Dun Glen soil for named elements:
Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Dun Glen soil for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—flooding
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones
Pond reservoir areas: Moderate—seepage
Embarkments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Soil blowing
Terraces and diversions: Erodes easily, soil blowing

Interpretive Groups

Capability classification: IIc, irrigated, and VIIC, nonirrigated
Range site: 024X002N

234—Dun Glen silt loam, frequently flooded, 0 to 2 percent slopes

Map Unit Setting

Position on landscape: Inset fans
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
- Dun Glen silt loam, frequently flooded, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—90 percent
Contrasting inclusions:
- Inclusion 1: Weso very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Misad gravelly very fine sandy loam, 0 to 2 percent slopes—Durothic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

Characteristics of the Dun Glen Soil

Position on landscape: Inset fans
Parent material: Loess high in content of volcanic ash over mixed alluvium
Slope features: Length—long; shape—plane
Dominant present vegetation: Winterfat, bud sagebrush, shadscale
Typical profile

0 to 3 inches—silt loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

3 to 10 inches—silt loam; 0 to 10 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

10 to 60 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); massive; soft, friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches

Flooding: Frequency—frequent; duration—very brief; months—January through May

Permeability: Moderate

Available water capacity: 6.8 to 8.0 inches

Water-supplying capacity: About 6 inches

Runoff: Very slow

Hydrologic group: B

Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—5

Hazard of erosion: By water—slight; by wind—slight

Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Low

Contrasting Inclusions

Inclusion 1

Position on landscape: Slightly convex parts of inset fans

Distinctive present vegetation: Shadscale, bud sagebrush

Inclusion 2

Position on landscape: Smooth fan skirts

Distinctive present vegetation: Shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Dun Glen soil for named elements:

Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Dun Glen soil for selected uses and practices

Range seeding: Poor—too arid, too crusty

Daily cover for landfill: Good

Shallow excavations: Moderate—flooding

Local roads and streets: Severe—flooding

Roadfill: Good

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Topsoil: Fair—small stones

Pond reservoir areas: Moderate—seepage

Embankments, dikes, and levees: Severe—piping

Drainage: Deep to water

Irrigation: Erodes easily, flooding

Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: IIIw, irrigated, and VIIw, nonirrigated

Range site: 024X004N

241—Toulon-Mazuma-Bluewing association

Map Unit Setting

Position on landscape: Basin floors

Elevation: 3,800 to 4,500 feet

Average annual precipitation: About 6 inches

Average annual air temperature: About 50 degrees F

Frost-free period: About 110 days

Composition

Major components:

• Toulon very gravelly loam, 2 to 8 percent slopes—Typic Camborthids, sandy-skeletal, mixed, mesic—35 percent

• Mazuma silt loam, strongly saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcereous), mesic—35 percent

• Bluewing very gravelly loam, 0 to 2 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—20 percent

Contrasting inclusions:

• Inclusion 1: Bezo silty clay, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcereous), mesic—5 percent

• Inclusion 2: Typic Torriorthents, silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcereous), mesic—3 percent

• Inclusion 3: Hawsley fine sand, 2 to 8 percent
slopes—Typic Torripsamsments, mixed, mesic—2 percent

**Characteristics of the Toulon Soil**

*Position on landscape:* Barrier bars  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, Bailey greasewood  
*Rock fragments on the surface:* Kind—gravel; percentage of surface covered—75

**Typical profile**

0 to 13 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

13 to 18 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 60 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

18 to 60 inches—stratified gravelly coarse sand to extremely cobbly coarse sand; 25 to 50 percent cobbles and stones and 60 to 75 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Rapid  
*Available water capacity:* 2.3 to 4.2 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential for frost action:* Low

**Characteristics of the Bluewing Soil**

*Position on landscape:* Alluvial fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush, Bailey greasewood, bottlebrush squirreltail  
*Rock fragments on the surface:* Kind—gravel, cobbles; percentage of surface covered—42

**Typical profile**

0 to 13 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less
than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

13 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); massive; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: In the upper 13 inches—moderate; below that depth—very rapid

Available water capacity: 1.9 to 3.1 inches

Water-supplying capacity: About 5 inches

Runoff: Very slow

Hydrologic group: A

Erosion factors (surface layer): K value—.15; T value—5; wind erodibility group—8

Hazard of erosion: By water—slight; by wind—slight

Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Low

Contrasting Inclusions

Inclusion 1

Position on landscape: Smooth lake plains

Distinctive present vegetation: Torrey quailbush

Inclusion 2

Position on landscape: The smooth lower part of alluvial flats

Distinctive present vegetation: Shadscale, black greasewood

Inclusion 3

Position on landscape: Dunes on alluvial flats and lake plains

Distinctive present vegetation: Indian ricegrass

Major Uses

Current uses: Rangeland, wildlife habitat

Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Toulon soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the Mazuma soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Bluewing soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Toulon soil for selected uses and practices

Range seeding: Poor—too arid, droughty, small stones

Daily cover for landfill: Poor—seepage, too sandy, small stones

Shallow excavations: Severe—cutbanks cave

Local roads and streets: Moderate—large stones

Roadfill: Fair—large stones

Sand: Probable source

Gravel: Probable source

Topsoil: Poor—small stones, area reclaim, too sandy

Pond reservoir areas: Severe—seepage

Embankments, dikes, and levees: Severe—seepage

Drainage: Deep to water

Irrigation: Large stones, droughty, slope

Terraces and diversions: Large stones, too sandy

Ratings and restrictive features of the Mazuma soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium

Daily cover for landfill: Poor—too sandy

Shallow excavations: Severe—cutbanks cave

Local roads and streets: Slight

Roadfill: Good

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Topsoil: Poor—excess salt, excess sodium

Pond reservoir areas: Severe—seepage

Embankments, dikes, and levees: Severe—piping, excess salt, excess sodium

Ratings and restrictive features of the Bluewing soil for selected uses and practices

Range seeding: Poor—too arid, small stones

Daily cover for landfill: Poor—seepage, too sandy, small stones

Shallow excavations: Severe—cutbanks cave

Local roads and streets: Slight

Roadfill: Good

Sand: Probable source

Gravel: Probable source

Topsoil: Poor—small stones, area reclaim

Pond reservoir areas: Severe—seepage

Embankments, dikes, and levees: Severe—seepage

Drainage: Deep to water
Irrigation: Droughty
Terraces and diversions: Large stones, too sandy

Interpretive Groups

Capability classification: Toulon—IVs, irrigated, and VIs, nonirrigated; Mazuma—VIs, nonirrigated; Bluewing—IVs, irrigated, and VIs, nonirrigated
Range site: Toulon—027X030N; Mazuma—027X025N; Bluewing—027X030N

251—Whirlo-Beoska-Oxcorel association

Map Unit Setting
Position on landscape: Fan piedmonts, fan skirts
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
• Whirlo very gravelly loam, 2 to 8 percent slopes—Typic Camborthods, loamy-skeletal, mixed, mesic—45 percent
• Beoska very stony loam, 2 to 8 percent slopes—Duric Natragids, fine-loamy, mixed, mesic—25 percent
• Oxcorel very stony loam, 2 to 8 percent slopes—Duric Natragids, fine, montmorillonitic, mesic—15 percent
Contrasting inclusions:
• Inclusion 1: Whirlo very stony loam, 0 to 4 percent slopes—Typic Camborthods, loamy-skeletal, mixed, mesic—5 percent
• Inclusion 2: Bluewing very sandy loam, frequently flooded, 2 to 8 percent slopes—Typic Torriorthents, sandy-loamy, mixed, mesic—5 percent
• Inclusion 3: Yipor silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—3 percent
• Inclusion 4: Dun Glen very fine sandy loam, 2 to 8 percent slopes—Typic Camborthods, coarse-loamy, mixed, mesic—2 percent

Characteristics of the Whirlo Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—40

Typical profile

0 to 7 inches—very gravelly loam; 5 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
7 to 11 inches—fine sandy loam; 0 to 10 percent cobbles and stones and 15 to 20 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SM; estimated AASHTO classification—A-4, A-2
11 to 60 inches—very gravelly sandy loam; 5 to 30 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 3.9 to 5.1 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.15; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Beoska Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—32

Typical profile

0 to 13 inches—very stony loam; 15 to 30 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
13 to 25 inches—clay loam; 0 to 25 percent pebbles (by weight)
weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.7); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

25 to 44 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2

44 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Very slow

**Available water capacity:** 6.1 to 8.0 inches

**Water-supplying capacity:** About 7 inches

**Runoff:** Medium

**Hydrologic group:** B

**Erosion factors (surface layer):** K value—.24; T value—5; wind erodibility group—5

**Hazard of erosion:** By water—slight; by wind—slight

**Shrink-swell potential:** Low

**Corrosivity:** To steel—high; to concrete—high

**Potential for frost action:** Low

**Characteristics of the Ocorel Soil**

**Position on landscape:** Fan piedmont remnants

**Parent material:** Mixed alluvium somewhat influenced by loess

**Slope features:** Length—long; shape—convex

**Dominant present vegetation:** Shadscale, bud sagebrush, bottlebrush squirreltail

**Rock fragments on the surface:** Kind—gravel, cobbles, stones; percentage of surface covered—30

**Typical profile**

0 to 8 inches—very stony loam; 10 to 25 percent cobbles and stones and 10 to 35 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

8 to 34 inches—clay loam; 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 24 to 46); estimated AASHTO classification—CL, CH; estimated AASHTO classification—A-7

34 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Very slow

**Available water capacity:** 6.1 to 8.0 inches

**Water-supplying capacity:** About 7 inches

**Runoff:** Medium

**Hydrologic group:** D

**Erosion factors (surface layer):** K value—.32; T value—5; wind erodibility group—7

**Hazard of erosion:** By water—slight; by wind—slight

**Shrink-swell potential:** High

**Corrosivity:** To steel—high; to concrete—moderate

**Potential for frost action:** Low

**Contrasting Inclusions**

**Inclusion 1**

**Position on landscape:** Slightly concave terraces adjacent to narrow drainageways on fan piedmonts

**Distinctive present vegetation:** Shadscale, bud sagebrush, bottlebrush squirreltail

**Inclusion 2**

**Position on landscape:** Narrow drainageways on fan piedmonts

**Distinctive present vegetation:** Rubber rabbitbrush

**Inclusion 3**

**Position on landscape:** The slightly concave lower part of fan skirts adjacent to alluvial flats

**Distinctive present vegetation:** Black greasewood

**Inclusion 4**

**Position on landscape:** The slightly convex lower part of fan skirts

**Distinctive present vegetation:** Shadscale, bud sagebrush, bottlebrush squirreltail

**Major Uses**

**Current uses:** Rangeland, wildlife habitat
Wildlife habitat elements

Suitability of the Whirlo soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the Beoska soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Oxcapel soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Whirlo soil for selected uses and practices

Range seeding: Poor—too arid, small stones, excess salt
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Severe—seepage
Embarkments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty, slope
Terraces and diversions: Large stones

Ratings and restrictive features of the Beoska soil for selected uses and practices

Range seeding: Poor—too arid, large stones, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Severe—seepage
Embarkments, dikes, and levees: Severe—excess salt, excess sodium

Ratings and restrictive features of the Oxcapel soil for selected uses and practices

Range seeding: Poor—too arid, large stones, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell

Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, too clayey
Pond reservoir areas: Severe—seepage
Embarkments, dikes, and levees: Severe—seepage, excess sodium

Interpretive Groups

Capability classification: Whirlo—IVs, irrigated, and VII, nonirrigated; Beoska—VII, nonirrigated; Oxcapel—VII, nonirrigated
Range site: Whirlo—024X002N; Beoska—024X002N; Oxcapel—024X002N

260—Golconda silt loam, 2 to 8 percent slopes

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,500 to 5,800 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
- Golconda silt loam, 2 to 8 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—85 percent

Contrasting inclusions:
- Inclusion 1: Blackhawk silt loam, 2 to 8 percent slopes—Entic Durorthids, loamy, mixed, mesic—10 percent
- Inclusion 2: Adelaide silt loam, 2 to 8 percent slopes—Entic Durorthids, loamy, mixed, mesic, shallow—5 percent

Characteristics of the Golconda Soil

Position on landscape: Fan piedmont remnants
Parent material: Loess high in content of volcanic ash over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Typical profile

0 to 10 inches—silt loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHO classification—A-4
10 to 23 inches—gravely clay loam; 10 to 45 percent pebbles (by weight); prismatic structure; very hard,
very firm; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); moderately sodic or strongly sodic (SAR 24 to 65); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

23 to 36 inches—strongly cemented duripan; massive; extremely hard, extremely firm
36 to 60 inches—very gravelly loamy coarse sand; 50 to 75 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—GP-GM, GM, GP; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—slow; below the duripan—moderately rapid
Available water capacity: 4.9 to 6.1 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: C

Erosion factors (surface layer): K value—.55; T value—2; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex foot slopes of fan piedmont remnants
Distinctive present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Inclusion 2
Position on landscape: Concave erosional fan remnants
Distinctive present vegetation: Wyoming big sagebrush

Major Uses

Current uses: Wildlife habitat, rangeland
Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Golconda soil for named elements:
Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Golconda soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, too crusty
Daily cover for landfill: Poor—cemented pan, seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—low strength
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—area reclaim, excess sodium, small stones
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium
Drainage: Deep to water
Irrigation: Cemented pan, slope, percs slowly
Terraces and diversions: Cemented pan, erodes easily

Interpretive Groups

Capability classification: IVe, irrigated, and VIIe, nonirrigated
Range site: 024X002N

261—Golconda silt loam, 8 to 15 percent slopes

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,200 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Golconda silt loam, 8 to 15 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—85 percent

Contrasting inclusions:
• Inclusion 1: Adelaide silt loam, 4 to 15 percent slopes—Entic Durorthids, loamy, mixed, mesic, shallow—5 percent
• Inclusion 2: Blackhawk silt loam, 2 to 8 percent slopes—Entic Durorthids, loamy, mixed, mesic, shallow—5 percent
• Inclusion 3: Weso very fine sandy loam, 2 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent

Characteristics of the Golconda Soil

Position on landscape: Fan piedmont remnants
Parent material: Loess high in content of volcanic ash over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, Sandberg bluegrass

Typical profile

0 to 10 inches—silt loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

10 to 23 inches—gravely clay loam; 10 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); moderately sodic or strongly sodic (SAR 24 to 65); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

23 to 36 inches—strongly cemented duripan; massive; extremely hard, extremely firm

36 to 60 inches—very gravelly loamy coarse sand; 50 to 75 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—GP-GM, GP, GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 20 to 40 inches

 Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Above the duripan—slow; below the duripan—moderately rapid

Available water capacity: 4.9 to 6.1 inches

Water-supplying capacity: About 6 inches

Runoff: Medium

Hydrologic group: C

Erosion factors (surface layer): K value—.55; T value—2; wind erodibility group—5

Hazard of erosion: By water—moderate; by wind—slight

Shrink-swell potential: Moderate

Corrosivity: To steel—high; to concrete—moderate

Potential for frost action: Low

Contrasting Inclusions

Inclusion 1

Position on landscape: Convex, north-facing side slopes of fan piedmont remnants

Distinctive present vegetation: Wyoming big sagebrush

Inclusion 2

Position on landscape: Convex crests of fan piedmont remnants

Distinctive present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Inclusion 3

Position on landscape: Convex inset fans and foot slopes of fan piedmont remnants

Distinctive present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Major Uses

Current uses: Rangeland, wildlife habitat

Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Golconda soil for named elements:

Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Golconda soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, too crusty

Daily cover for landfill: Poor—cemented pan, seepage, small stones

Shallow excavations: Severe—cutbanks cave

Local roads and streets: Severe—low strength

Roadfill: Good

Sand: Probable source

Gravel: Probable source

Topsoil: Poor—area reclaim, excess sodium, small stones

Pond reservoir areas: Severe—seepage, slope

Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium

Drainage: Deep to water

Irrigation: Percs slowly, cemented pan, slope

Terraces and diversions: Slope, cemented pan, erodes easily

Interpretive Groups

Capability classification: IVe, irrigated, and VIIe, nonirrigated

Range site: 024X002N

270—Goldrun fine sand, 4 to 15 percent slopes

Map Unit Setting

Position on landscape: Dunes

Elevation: 3,600 to 5,000 feet

Average annual precipitation: About 8 inches

Average annual air temperature: About 48 degrees F

Frost-free period: About 110 days
Composition

Major component:
- Goldrun fine sand, 4 to 15 percent slopes—Xeric Torripsamments, mixed, mesic—85 percent

Contrasting inclusions:
- Inclusion 1: Durixerollie Camborthids fine sandy loam, 2 to 8 percent slopes—Durixerollie Camborthids, coarse-silty, mixed, mesic—4 percent
- Inclusion 2: Rebel loam, 2 to 8 percent slopes—Xerollar Camborthids, coarse-loamy, mixed, mesic—4 percent
- Inclusion 3: Valmy fine sandy loam, 2 to 8 percent slopes—Durorthid Torriorhythms, coarse-loamy, mixed (calcareous), mesic—4 percent
- Inclusion 4: Benin silt loam, 0 to 2 percent slopes—Typic Torriorhythms, fine, montmorillonitic (calcareous), mesic—3 percent

Characteristics of the Goldrun Soil

Position on landscape: Sand dunes
Parent material: Eolian material and sandy lacustrine material somewhat influenced by volcanic ash
Slope features: Length—short; shape—convex
Dominant present vegetation: Basin big sagebrush, spiny hopsage, needleandthread

Typical profile
0 to 8 inches—fine sand; single grain; loose; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2
8 to 60 inches—fine sand; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Rapid
Available water capacity: 4.2 to 5.4 inches
Water-supplying capacity: About 8 inches
Runoff: Very slow
Hydrologic group: A
Erosion factors (surface layer): K value—.17; T value—5; wind erodibility group—1
Hazard of erosion: By water—slight; by wind—very severe
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex fan skirts
Distinctive present vegetation: Black greasewood

Inclusion 2
Position on landscape: Convex inset fans
Distinctive present vegetation: Wyoming big sagebrush

Inclusion 3
Position on landscape: Concave inset fans
Distinctive present vegetation: Shadscale

Inclusion 4
Position on landscape: Plane to convex alluvial flats
Distinctive present vegetation: Shadscale

Major Uses

Current uses: Rangeland, wildlife habitat
Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Goldrun soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Goldrun soil for selected uses and practices

Range seeding: Poor—too sandy, soil blowing, droughty
Daily cover for landfill: Poor—too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—slope
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—too sandy
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage, piping
Drainage: Deep to water
Irrigation: Droughty, fast intake, soil blowing
Terraces and diversions: Slope, too sandy, soil blowing

Interpretive Groups

Capability classification: IVs, irrigated, and VII, nonirrigated
Range site: 024X001N

281—Golsum-Spinlin-Harcany association

Map Unit Setting

Position on landscape: Mountain slopes
Elevation: 6,000 to 7,500 feet
Average annual precipitation: About 13 inches
Average annual air temperature: About 40 degrees F
Frost-free period: About 65 days

Composition

Major components:
- Golsum very cobbly loam, 30 to 50 percent slopes—Aridic Calcic Argixerolls, clayey-skeletal, montmorillonitic, frigid—35 percent
- Spinifliff very stony silt loam, 30 to 50 percent slopes—Argic Cryoborolls, clayey-skeletal, montmorillonitic—25 percent
- Harcany stony silt loam, 30 to 50 percent slopes—Pachic Cryoborolls, loamy-skeletal, mixed—25 percent
Contrasting inclusions:
- Inclusion 1: Cleavage extremely gravelly loam; 4 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—7 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Pachic Cryoborolls silt loam, 30 to 50 percent slopes—Pachic Cryoborolls, fine-loamy, mixed—2 percent
- Inclusion 4: Fluventic Haploxerolls loam, 2 to 8 percent slopes—Fluventic Haploxerolls, fine-loamy, mixed, frigid—1 percent

Characteristics of the Golsum Soil

Position on landscape: South- and west-facing side slopes of mountains
Parent material: Kind—residuum; source—tuff, sedimentary and metamorphic rocks
Slope features: Length—long; shape—plane to convex
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, basin wildrye

Typical profile

0 to 9 inches—very cobbly loam; 50 to 65 percent cobbles and stones and 15 to 30 percent pebbles (by weight); slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2
31 inches—weathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 2.8 to 3.5 inches
Water-supplying capacity: About 12 inches
Runoff: Rapid

Hydrologic group: C
Erosion factors (surface layer): K value—.17; T value—2; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Spinfliff Soil

Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—quartzite, chert, rhyolite
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, bluebunch wheatgrass, Idaho fescue

Typical profile

0 to 6 inches—very stony silt loam; 25 to 35 percent cobbles and stones and 15 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6
6 to 36 inches—very cobbly clay; 35 to 45 percent cobbles and stones and 30 to 55 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-7
36 inches—weathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 4.1 to 4.9 inches
Water-supplying capacity: About 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.17; T value—2; wind erodibility group—8
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Harcany Soil
Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—sandstone, andesite, argillite, quartzite
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, snowberry, bluebunch wheatgrass

Typical profile
0 to 4 inches—stony silt loam; 5 to 10 percent cobbles and stones and 30 to 40 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
4 to 18 inches—very gravelly silt loam; 15 to 25 percent cobbles and stones and 50 to 60 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-4
18 to 72 inches or more—extremely gravelly sandy loam; 15 to 25 percent cobbles and stones and 65 to 85 percent pebbles (by weight); massive; hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; GW-GM; estimated AASHO classification—A-1

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 8.6 to 10.1 inches
Water-supplying capacity: About 3 to 15 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Low sagebrush

Inclusion 2
Position on landscape: The crests and upper side slopes of mountains
Distinctive present vegetation: Barren

Inclusion 3
Position on landscape: Side slopes of mountains
Distinctive present vegetation: Quaking aspen

Inclusion 4
Position on landscape: Concave stream terraces
Distinctive present vegetation: Basin wildrye

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Golsum soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Spinlin soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Harcany soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Golsum soil for selected uses and practices

Range seeding: Poor—erodes easily, large stones
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, too clayey
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Spinlin soil for selected uses and practices

Range seeding: Poor—erodes easily, slope, large stones
Daily cover for landfill: Poor—depth to bedrock, too clayey, small stones
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope, shrink-swell
Roadfill: Poor—depth to bedrock, shrink-swell, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, too clayey
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Harcany soil
for selected uses and practices

Range seeding: Poor—eroses easily, slope
Daily cover for landfill: Poor—seepage, small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, slope, area reclaim
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage

Interpretive Groups

Capability classification: Golsum—VII, nonirrigated;
Spinlin—VII, nonirrigated; Harcany—VII, nonirrigated
Range site: Golsum—024X029N; Spinlin—024X027N;
Harcany—024X032N

321—Humboldt silty clay loam, slightly saline-sodic

Map Unit Setting
Position on landscape: Flood plains
Elevation: 3,900 to 4,300 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Humboldt silty clay loam, slightly saline-sodic, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, montmorillonitic (calcaceous), mesic—90 percent

Contrasting inclusions:
• Inclusion 1: Sonoma silty clay loam, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcaceous), mesic—5 percent
• Inclusion 2: Fluvaquentic Haploxerolls loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—4 percent
• Inclusion 3: Humboldt silty clay loam, strongly saline-sodic, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, montmorillonitic (calcaceous), mesic—1 percent

Characteristics of the Humboldt Soil
Position on landscape: Flood plains

Parent material: Mixed silty alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Willow, creeping wildrye, basin wildrye

Typical profile

0 to 6 inches—silty clay loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-7
6 to 60 inches—stratified silty clay loam to clay; massive; hard, firm; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—MH; estimated AASHTO classification—A-7

Soil and water features

Depth to a seasonal high water table: December through June—6 to 24 inches; rest of year—more than 60 inches
Flooding: Frequency—frequent; duration—brief to long; months—February through June
Permeability: Moderately slow
Available water capacity: 10.3 to 11.5 inches
Water-supplying capacity: About 13 inches
Runoff: Very slow
Hydrologic group: D
Erosion factors (surface layer): K value—.37; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Contrasting Inclusions

Inclusion 1
Position on landscape: Narrow drainageways
Distinctive present vegetation: Black greasewood

Inclusion 2
Position on landscape: Convex shoulder slopes of drainageways
Distinctive present vegetation: Basin wildrye, creeping wildrye

Inclusion 3
Position on landscape: Flood plains
Distinctive present vegetation: Alkali sacaton, inland saltgrass

Major Uses

Current uses: Irrigated cropland, rangeland, wildlife habitat
Wildlife habitat elements

Suitability of the Humboldt soil for named elements:
- Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—good; shallow water areas—good

Ratings and restrictive features of the Humboldt soil for selected uses and practices
- Range seeding: Poor—excess salt, excess sodium
- Daily cover for landfills: Poor—too clayey, hard to pack, wetness
- Shallow excavations: Severe—wetness
- Local roads and streets: Severe—low strength, wetness, flooding
- Roadfill: Poor—low strength, wetness
- Sand: Improbable source—excess fines
- Gravel: Improbable source—excess fines
- Topsoil: Poor—excess salt, wetness, too clayey
- Pond reservoir areas: Moderate—seepage
- Embankments, dikes, and levees: Severe—hard to pack, wetness, excess salt
- Drainage: Flooding, frost action
- Irrigation: Wetness
- Terraces and diversions: Wetness, erodes easily

Interpretive Groups
- Capability classification: Illw, irrigated, and Vilw, nonirrigated
- Range site: 025X001N

322—Humboldt silty clay loam, strongly saline-sodic

Map Unit Setting
- Position on landscape: Flood plains
- Elevation: 3,900 to 4,300 feet
- Average annual precipitation: About 8 inches
- Average annual air temperature: About 48 degrees F
- Frost-free period: About 110 days

Composition
- Major component:
  - Humboldt silty clay loam, strongly saline-sodic, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, fine, montmorillonitic (calcareous), mesic—90 percent
  - Contrasting inclusions:
    - Inclusion 1: Sonoma silty clay loam, occasionally flooded, strongly saline-sodic, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent
    - Inclusion 2: Fluvaquentic Haploxerolls loam, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—4 percent
  - Inclusion 3: Humboldt silty clay loam, slightly saline-sodic, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, montmorillonitic (calcareous), mesic—1 percent

Characteristics of the Humboldt Soil

Position on landscape: Flood plains
- Parent material: Mixed silty alluvium influenced by volcanic ash
- Slope features: Length—long; shape—slightly convex
- Dominant present vegetation: Alkali sacaton, inland saltgrass, basin wildrye, black greasewood

Typical profile
- 0 to 13 inches—silty clay loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.5); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL; estimated AASHTO classification—A-7
- 13 to 60 inches—stratified silty clay loam to clay; massive; hard, firm; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic to moderately sodic (SAR 5 to 45); estimated Unified classification—MH; estimated AASHTO classification—A-7

Soil and water features
- Depth to a seasonal high water table: December through June—6 to 24 inches; rest of year—more than 60 inches
- Flooding: Frequency—frequent; duration—brief to long; months—February through June
- Permeability: Moderately slow
- Available water capacity: 10.3 to 11.5 inches
- Water-supplying capacity: About 13 to 15 inches
- Runoff: Very slow
- Hydrologic group: D
- Erosion factors (surface layer): K value—.37; T value—5; wind erodibility group—4L
- Hazard of erosion: By water—slight; by wind—slight
- Shrink-swell potential: Moderate
- Corrosivity: To steel—high; to concrete—high
- Potential for frost action: High

Contrasting Inclusions

Inclusion 1
- Position on landscape: The smooth upper part of flood plains
- Distinctive present vegetation: Basin wildrye, black greasewood

Inclusion 2
- Position on landscape: Natural levees of channels
Distinctive present vegetation: Willow, creeping wildrye, basin wildrye

Inclusion 3
Position on landscape: Oxbows and depressional areas on flood plains
Distinctive present vegetation: Willow, creeping wildrye, basin wildrye

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Humboldt soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—good; shallow water areas—good

Ratings and restrictive features of the Humboldt soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium
Daily cover for landfill: Poor—too clayey, hard to pack, wetness
Shallow excavations: Severe—wetness
Local roads and streets: Severe—low strength, wetness, flooding
Roadfill: Poor—low strength, wetness
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, wetness, too clayey
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—hard to pack, wetness, excess salt

Interpretive Groups
Capability classification: VIlw, nonirrigated
Range site: 024X007N

330—McConnel loam, 0 to 2 percent slopes

Map Unit Setting
Position on landscape: Inset fans
Elevation: 4,200 to 4,800 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

Composition

Major component:
• McConnel loam, 0 to 2 percent slopes—Xerolic Camborthids, sandy-skeletal, mixed, mesic—85 percent

Contrasting inclusions:
• Inclusion 1: Rebel loam, 0 to 2 percent slopes—Xerolic Camborthids, coarse-loamy, mixed, mesic—8 percent
• Inclusion 2: Orovada fine sandy loam, 0 to 2 percent slopes—Duirxerolic Camborthids, coarse-loamy, mixed, mesic—7 percent

Characteristics of the McConnel Soil
Position on landscape: Inset fans
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, Sandberg bluegrass, bottlebrush squirreltail

Typical profile

0 to 20 inches—loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
20 to 60 inches—extremely gravelly loamy coarse sand; 0 to 15 percent cobbles and stones and 65 to 90 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.5); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic or slightly sodic (SAR 5 to 23); estimated Unified classification—GP; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Rapid
Available water capacity: 4.0 to 5.4 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.37; T value—2; wind erosibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex inset fans
Distinctive present vegetation: Wyoming big sagebrush, Sandberg bluegrass

Inclusion 2
Position on landscape: Smooth fan skirts
Distinctive present vegetation: Wyoming big sagebrush, Sandberg bluegrass

Major Uses
Current uses: Rangeland, wildlife habitat
Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the McConnel soil for named elements:
Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the McConnel soil for selected uses and practices

Range seeding: Fair—too arid
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, too sandy
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt
Drainage: Deep to water
Irrigation: Droughty
Terraces and diversions: Too sandy, erodes easily

Interpretive Groups

Capability classification: IVs, irrigated, and VII, nonirrigated
Range site: 024X020N

331—McConnel gravelly fine sandy loam, 4 to 8 percent slopes

Map Unit Setting

Position on landscape: Inset fans
Elevation: 4,200 to 4,800 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
- McConnel gravelly fine sandy loam, 4 to 8 percent slopes—Xerollic Camborthids, sandy-skeletal, mixed, mesic—85 percent
Contrasting inclusions:
- Inclusion 1: Orovada gravelly fine sandy loam, 4 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—8 percent
- Inclusion 2: Bliss gravelly fine sandy loam, 4 to 8 percent slopes—Haploxerollic Durorthids, coarse-loamy, mixed, mesic—7 percent

Characteristics of the McConnel Soil

Position on landscape: Inset fans
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—concave
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel; percentage of surface covered—20

Typical profile

0 to 20 inches—gravelly fine sandy loam; 30 to 50 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-4
20 to 60 inches—extremely gravelly loamy coarse sand; 0 to 15 percent pebbles and stones and 65 to 90 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.5); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Rapid
Available water capacity: 4.0 to 5.4 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.32; T value—2; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: The convex upper part of fan
Distinctive present vegetation: Wyoming big sagebrush, Sandberg bluegrass

Inclusion 2
Position on landscape: The convex lower part of fan
Distinctive present vegetation: Wyoming big sagebrush, Sandberg bluegrass
Major Uses

Current uses: Rangeland, wildlife habitat
Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the McConnel soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; domestic grasses and legumes (irrigated)—fair; grain and seed crops (irrigated)—fair

Ratings and restrictive features of the McConnel soil for selected uses and practices

Range seeding: Fair—too arid
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, too sandy
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt
Drainage: Deep to water
Irrigation: Droughty, slope
Terraces and diversions: Too sandy

Interpretive Groups

Capability classification: IVe, irrigated, and VIIc, nonirrigated
Range site: 024X020N

360—Needle Peak silt loam, slightly saline-sodic

Map Unit Setting

Position on landscape: Flood plains
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Needle Peak silt loam, slightly saline-sodic, 0 to 2 percent slopes—Aquic Torriorthents, fine-silty, mixed (calcareous), mesic—75 percent
• Inclusion 2: Benin silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine, montmorillonitic (calcareous), mesic—3 percent
• Inclusion 3: Dun Glen silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—3 percent
• Inclusion 4: Raglan silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—2 percent

Characteristics of the Needle Peak Soil

Position on landscape: Flood plains
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—plane
Dominant present vegetation: Basin big sagebrush, basin wildrye, bottlebrush squirreltail

Typical profile

0 to 4 inches—silt loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.2); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7
4 to 60 inches—silt loam; massive; hard, friable; strongly alkaline (pH 8.9); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7

Soil and water features

Depth to a seasonal high water table: January through June—36 to 60 inches; rest of year—more than 60 inches
Flooding: Rare
Permeability: Moderately slow
Available water capacity: 11.4 to 12.6 inches
Water-supplying capacity: About 10 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: High

Contrasting Inclusions

Inclusion 1
Position on landscape: The smooth lower part of flood plains
Distinctive present vegetation: Black greasewood
Inclusion 2  
**Position on landscape:** Smooth alluvial flats adjacent to flood plains  
**Distinctive present vegetation:** Shadscale

Inclusion 3  
**Position on landscape:** Smooth fan skirts adjacent to flood plains  
**Distinctive present vegetation:** Shadscale

Inclusion 4  
**Position on landscape:** Smooth toe slopes of fan skirts  
**Distinctive present vegetation:** Shadscale

**Major Uses**

**Current uses:** Rangeland, wildlife habitat  
**Foreseeable uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements**

**Suitability of the Needle Peak soil for named elements:**  
Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—fair; shallow water areas—fair

**Ratings and restrictive features of the Needle Peak soil for selected uses and practices**

**Range seeding:** Poor—excess salt, excess sodium, too crusty  
**Daily cover for landfill:** Fair—too clayey, wetness  
**Shallow excavations:** Moderate—wetness  
**Local roads and streets:** Severe—low strength, frost action  
**Roadfill:** Poor—low strength  
**Sand:** Improbable source—excess fines  
**Gravel:** Improbable source—excess fines  
**Topsoil:** Fair—too clayey  
**Pond reservoir areas:** Slight  
**Embankments, dikes, and levees:** Moderate—piping, wetness  
**Drainage:** Deep to water  
**Irrigation:** Excess salt  
**Terraces and diversions:** Erodes easily

**Interpretive Groups**

**Capability classification:** I1w, irrigated, and V1w, nonirrigated  
**Range site:** 024X006N

380—Ninch fine sand, 0 to 15 percent slopes

**Map Unit Setting**

**Position on landscape:** Sand dunes, sand sheets

**Elevation:** 4,000 to 4,500 feet  
**Average annual precipitation:** About 8 inches  
**Average annual air temperature:** About 47 degrees F  
**Frost-free period:** About 110 days

**Composition**

**Major component:**  
- Ninch fine sand, 0 to 15 percent slopes—Durorthic Xeric Torrifluvents, sandy, mixed, mesic—85 percent

**Contrasting inclusions:**  
- Inclusion 1: Goldrun fine sand, 4 to 15 percent slopes—Xeric Torripsamments, mixed, mesic—8 percent  
- Inclusion 2: Valmy sandy loam, 0 to 2 percent slopes—Durorthic Torriorthents, coarse-loamy, mixed (calcareous), mesic—7 percent

**Characteristics of the Ninch Soil**

**Position on landscape:** Sand dunes, sand sheets  
**Parent material:** Eolian material influenced by volcanic ash  
**Slope features:** Length—long; shape—convex and smooth  
**Dominant present vegetation:** Basin big sagebrush, Indian ricegrass, needleandthread, rabbitbrush

**Typical profile**

0 to 6 inches—fine sand; single grain; loose; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2

6 to 35 inches—stratified fine sand to loamy fine sand; massive; soft; very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2

35 to 41 inches—fine sandy loam; massive; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2

41 to 70 inches—very fine sandy loam; massive; very hard, firm; very strongly alkaline (pH 9.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None  
**Permeability:** Moderately rapid  
**Available water capacity:** 7.8 to 8.6 inches
Water-supplying capacity: About 8 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—3; wind erodibility group—1
Hazard of erosion: By water—slight; by wind—severe
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Dunes
Distinctive present vegetation: Basin big sagebrush, Indian ricegrass

Inclusion 2
Position on landscape: Smooth and slightly concave inset fan remnants adjacent to drainageways
Distinctive present vegetation: Black greasewood, basin wildrye

Major Uses

Current uses: Rangeland, wildlife habitat
Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Ninch soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair

Ratings and restrictive features of the Ninch soil for selected uses and practices

Range seeding: Poor—droughty, too sandy
Daily cover for landfill: Poor—too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—too sandy
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, piping
Drainage: Deep to water
Irrigation: Droughty, soil blowing, fast intake
Terraces and diversions: Too sandy, soil blowing

Interpretive Groups

Capability classification: IVs, irrigated, and VII, nonirrigated
Range site: 024X001N

400—Orovada loam, 0 to 2 percent slopes

Map Unit Setting

Position on landscape: Fan skirts
Elevation: 4,200 to 4,800 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Orovada loam, 0 to 2 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—85 percent
Contrasting inclusions:
• Inclusion 1: Rebel loam, 0 to 2 percent slopes—Xerolic Camborthids, coarse-loamy, mixed, mesic—6 percent
• Inclusion 2: Dun Glen loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—4 percent
• Inclusion 3: McConnel cobbly very fine sandy loam, 0 to 2 percent slopes—Xerolic Camborthids, sandy-skeletal, mixed, mesic—3 percent
• Inclusion 4: Adelaide loam, 0 to 2 percent slopes—Entic Durothids, loamy, mixed, mesic, shallow—2 percent

Characteristics of the Orovada Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—plane to convex
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, Sandberg bluegrass, rabbitbrush

Typical profile

0 to 6 inches—loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 15 inches—fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

15 to 60 inches—very fine sandy loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 9.0 to 10.2 inches
Water-supplying capacity: About 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.49; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: The smooth lower part of fan skirts
Distinctive present vegetation: Wyoming big sagebrush, Sandberg bluegrass

Inclusion 2
Position on landscape: The smooth lower part of fan skirts
Distinctive present vegetation: Shadscale

Inclusion 3
Position on landscape: Smooth and slightly concave inset fans
Distinctive present vegetation: Wyoming big sagebrush, Sandberg bluegrass

Inclusion 4
Position on landscape: The smooth and slightly convex upper part of fan skirts
Distinctive present vegetation: Wyoming big sagebrush, Sandberg bluegrass

Major Uses

Current uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Orovada soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Orovada soil for selected uses and practices

Range seeding: Fair—too arid
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action

Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones, thin layer
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Erodes easily
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: IIIc, irrigated, and VIIc, nonirrigated
Range site: 024X020N

406—Orovada very fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

Position on landscape: Fan skirts
Elevation: 4,000 to 5,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days

Composition

Major component:
Orovada very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—90 percent
Contrasting inclusions:
Inclusion 1: Durixerollic Camborthids very stony very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—7 percent
Inclusion 2: Xeric Torriorthents very cobbly loam, occasionally flooded, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed, mesic—2 percent
Inclusion 3: Valmy fine sandy loam, 2 to 8 percent slopes—Duorthidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—1 percent

Characteristics of the Orovada Soil

Position on landscape: Fan skirts
Parent material: Loess high in content of volcanic ash over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Thurber needlegrass, Wyoming big sagebrush, spiny hopsage
Rock fragments on the surface: Kind—gravel;
percentage of surface covered—10

Typical profile
0 to 11 inches—very fine sandy loam; 0 to 10 percent
pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

11 to 24 inches—fine sandy loam; 5 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

24 to 60 inches—very fine sandy loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

Soil and water features

*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Moderate
*Available water capacity:* 9.0 to 10.2 inches
*Water-supplying capacity:* About 8 inches
*Runoff:* Slow
*Hydrologic group:* B
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* Low
*Corrosivity:* To steel—high; to concrete—low
*Potential for frost action:* Moderate

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* Concave side slopes of fan remnants
**Distinctive present vegetation:** Wyoming big sagebrush, Thurber needlegrass

**Inclusion 2**
*Position on landscape:* Channels
**Distinctive present vegetation:** Basin wildrye

**Inclusion 3**
*Position on landscape:* The lower part of fan skirts and fan aprons
**Distinctive present vegetation:** Black greasewood

**Major Uses**

*Current uses:* Rangeland, wildlife habitat
*Foreseeable uses:* Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements**

**Suitability of the Orovida soil for named elements:** Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the Orovida soil for selected uses and practices**

*Range seeding:* Fair—too arid
*Daily cover for landfill:* Good
*Shallow excavations:* Slight
*Local roads and streets:* Moderate—frost action
*Roadfill:* Good
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Fair—small stones, thin layer
*Pond reservoir areas:* Moderate—seepage, slope
*Embankments, dikes, and levees:* Severe—piping
*Drainage:* Deep to water
*Irrigation:* Erodes easily, slope
*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* IIle, irrigated, and Vlc, nonirrigated
*Range site:* 024X020N

**431—Preble silt loam, strongly saline-sodic**

**Map Unit Setting**

*Position on landscape:* Alluvial flats
*Elevation:* 4,000 to 5,000 feet
*Average annual precipitation:* About 8 inches
*Average annual air temperature:* About 48 degrees F
*Frost-free period:* About 110 days

**Composition**

*Major component:* Preble silt loam, strongly saline-sodic, 0 to 2 percent slopes—Aquic Durothidic Torriorthents, coarse-loamy, mixed (calcaceous), mesic—90 percent

**Contrasting inclusions:**

- Inclusion 1: Valmy fine sandy loam, 0 to 2 percent slopes—Durothidic Torriorthents, coarse-loamy, mixed (calcaceous), mesic—5 percent
- Inclusion 2: Ninch fine sand, 0 to 2 percent slopes—Durothidic Xeric Torrifluvents, sandy, mixed, mesic—3 percent
- Inclusion 3: Sonoma silt loam, strongly saline-sodic, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcaceous), mesic—2 percent
Characteristics of the Preble Soil

Position on landscape: Alluvial flats
Parent material: Mixed alluvium and lake sediments influenced by pyroclastic material
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, seepweed

Typical profile

0 to 4 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.5); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

4 to 44 inches—fine sandy loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.3); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

44 to 60 inches—sandy clay loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.0); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, SC; estimated AASHTO classification—A-2, A-6, A-7

Soil and water features

Depth to a seasonal high water table: February through June—36 inches; rest of year—more than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 8.0 to 10.0 inches
Water-supplying capacity: About 10 inches
Runoff: Very slow
Hydrologic group: D
Erosion factors (surface layer): K value—43; T value—4; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Smooth fan skirts
Distinctive present vegetation: Basin big sagebrush

Inclusion 2
Position on landscape: Slightly concave channels
Distinctive present vegetation: Basin big sagebrush

Inclusion 3
Position on landscape: Smooth lake plain terraces
Distinctive present vegetation: Basin wildrye, black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Preble soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Preble soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too crusty
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt, excess sodium

Interpretive Groups
Capability classification: VIIw, nonirrigated
Range site: 024X011N

451—Pumper loam

Map Unit Setting

Position on landscape: Fan skirts
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Pumper loam, 0 to 2 percent slopes—Typic Camborthids, sandy-skeletal, mixed, mesic—85 percent

Contrasting inclusions:
• Inclusion 1: Adelaide loam, 0 to 2 percent slopes—Ertic Durothids, loamy, mixed, mesic, shallow—4 percent
• Inclusion 2: Blackhawk loam, 0 to 2 percent slopes—Ertic Durothids, loamy, mixed, mesic, shallow—4 percent
• Inclusion 3: Dun Glen loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—4 percent
• Inclusion 4: McConnel loam, 0 to 2 percent slopes—
Xerollic Camborthids, sandy-skeletal, mixed, mesic—3 percent

**Characteristics of the Pumper Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Loamy loess high in content of volcanic ash over mixed alluvium  
*Slope features:* Length—long; shape—plane  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail, Sandberg bluegrass  

**Typical profile**

0 to 12 inches—loam; 0 to 15 percent pebbles (by weight); weak fine subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4  
12 to 60 inches—stratified very gravelly loam to extremely gravelly coarse sand; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP; estimated AASHTO classification—A-1  

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Rapid  
*Available water capacity:* 3.1 to 4.8 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—2; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions**

**Inclusion 1**  
*Position on landscape:* Concave fan piedmont remnants adjacent to fan skirts  
*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 2**  
*Position on landscape:* Convex fan piedmont remnants adjacent to fan skirts  
*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 3**  
*Position on landscape:* The smooth lower part of fan skirts  
*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 4**  
*Position on landscape:* Narrow drainageways on fan skirts  
*Distinctive present vegetation:* Wyoming big sagebrush

**Major Uses**

*Current uses:* Rangeland, wildlife habitat  
*Foreseeable uses:* Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements**

*Suitability of the Pumper soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings and restrictive features of the Pumper soil for selected uses and practices**

*Range seeding:* Poor—too arid  
*Daily cover for landfill:* Poor—seepage, too sandy, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Topsoil:* Poor—small stones, area reclaim, too sandy  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—seepage  
*Drainage:* Deep to water  
*Irrigation:* Droughty  
*Terraces and diversions:* Erodes easily, too sandy

**Interpretive Groups**

*Capability classification:* IVs, irrigated, and VIs, nonirrigated  
*Range site:* 024X002N

**470—Raglan silt loam**

**Map Unit Setting**

*Position on landscape:* Alluvial flat remnants  
*Elevation:* 4,000 to 4,800 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free period:* About 110 days
Composition

Major component:
- Raglan silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—85 percent
Contrasting inclusions:
- Inclusion 1: Dun Glen silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: Needle Peak silt loam, 0 to 2 percent slopes—Aquic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 3: Batan silt loam, 0 to 2 percent slopes—Durorthic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

Characteristics of the Raglan Soil

Position on landscape: Alluvial flat remnants
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, Sandberg bluegrass

Typical profile

0 to 7 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4, A-6
7 to 13 inches—silt loam; 0 to 5 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, ML; estimated AASHTO classification—A-4, A-6
13 to 60 inches—stratified very fine sandy loam to silty clay loam; 0 to 5 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.9); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, ML; estimated AASHTO classification—A-4, A-6

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 11.0 to 12.6 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow

Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex inset fans
Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

Inclusion 2
Position on landscape: Concave inset fans
Distinctive present vegetation: Basin big sagebrush, basin wildrye

Inclusion 3
Position on landscape: Smooth alluvial flat remnants
Distinctive present vegetation: Shadscale, black greasewood

Major Uses

Current uses: Rangeland, irrigated cropland

Wildlife habitat elements

Suitability of the Raglan soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Raglan soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess salt
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—low strength, shrink-swell
Roadfill: Fair—low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—thin layer
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping, excess salt
Drainage: Deep to water
Irrigation: Eroses easily, excess salt
Terraces and diversions: Eroses easily

Interpretive Groups

Capability classification: IIc, irrigated, and VIIc, nonirrigated
Range site: 024X002N
471—Raglan silt loam, moderately saline-sodic

**Map Unit Setting**

*Position on landscape:* Alluvial flats  
*Elevation:* 4,000 to 4,800 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free period:* About 110 days

**Composition**

*Major component:*  
- Raglan silt loam, moderately saline-sodic, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—85 percent  
- Inclusion 1: Dun Glen silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—5 percent  
- Inclusion 2: Needle Peak silt loam, slightly saline-sodic, 0 to 2 percent slopes—Aquic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent  
- Inclusion 3: Batan silt loam, 0 to 2 percent slopes—Durorthic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

**Characteristics of the Raglan Soil**

*Position on landscape:* Alluvial flat remnants  
*Parent material:* Loess and volcanic ash over mixed alluvium and lacustrine material  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, black greasewood, bud sagebrush

**Typical profile**

0 to 7 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic to moderately sodic (SAR 5 to 40); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

7 to 13 inches—silt loam; 0 to 5 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); moderately sodic or strongly sodic (SAR 30 to 130); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4, A-6

13 to 60 inches—stratified very fine sandy loam to silty clay loam; 0 to 5 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.9); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR 47 to 170); estimated Unified classification—CL, ML; estimated AASHTO classification—A-4, A-6

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 11.4 to 12.6 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—high  
*Potential for frost action:* Low

**Contrasting Inclusions**

**Inclusion 1**  
*Position on landscape:* Fan skirts adjacent to the upper part of alluvial flats  
*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 2**  
*Position on landscape:* Channels  
*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

**Inclusion 3**  
*Position on landscape:* Smooth alluvial flats  
*Distinctive present vegetation:* Shadscale, black greasewood

**Major Uses**

*Current uses:* Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Raglan soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings and restrictive features of the Raglan soil for selected uses and practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—low strength, shrink-swell  
*Roadfill:* Fair—low strength, shrink-swell  
*Sand:* Improvable source—excess fines  
*Gravel:* Improvable source—excess fines  
*Topsoil:* Poor—excess salt, excess sodium  
*Pond reservoir areas:* Slight  
*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium
Interpretive Groups
Capability classification: VIIa, nonirrigated
Range site: 024X003N

480—Rebel loam, 0 to 2 percent slopes
Map Unit Setting
Position on landscape: Inset fans
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition
Major component:
• Rebel loam, 0 to 2 percent slopes—Xericolic Camborthids, coarse-loamy, mixed, mesic—85 percent
Contrasting inclusions:
• Inclusion 1: McConnel loam, 0 to 2 percent slopes—
Xericolic Camborthids, sandy-skeletal, mixed, mesic—5 percent
• Inclusion 2: Needle Peak silt loam, 0 to 2 percent slopes—Aquic Torriorthents, fine-silty, mixed
(calcareous), mesic—5 percent
• Inclusion 3: Orovada loam, 0 to 2 percent slopes—
Durixerolic Camborthids, coarse-loamy, mixed, mesic—5 percent

Characteristics of the Rebel Soil
Position on landscape: Inset fans
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, bottlebrush squirreltail, Sandberg bluegrass

Typical profile
0 to 13 inches—loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
13 to 60 inches—loam; 5 to 15 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 7.9 to 9.3 inches
Water-supplying capacity: About 8 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions
Inclusion 1
Position on landscape: The upper drainageways
Distinctive present vegetation: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2
Position on landscape: The lower drainageways
Distinctive present vegetation: Basin big sagebrush, basin wildrye

Inclusion 3
Position on landscape: Convex areas on inset fans
Distinctive present vegetation: Wyoming big sagebrush, bottlebrush squirreltail

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements
Suitability of the Rebel soil for named elements: Grain
and seed crops (irrigated)—good; domestic grasses
and legumes (irrigated)—good; wild herbaceous
plants (nonirrigated)—fair; shrubs (nonirrigated)—
fair

Ratings and restrictive features of the Rebel soil for
selected uses and practices
Range seeding: Fair—too arid
Daily cover for landfills: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Erodes easily
Terraces and diversions: Erodes easily

Interpretive Groups
Capability classification: IIC, irrigated, and Vlc, nonirrigated
Range site: 024X020N
481—Rebel loam, 2 to 4 percent slopes

Map Unit Setting

Position on landscape: Inset fans
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
- Rebel loam, 2 to 4 percent slopes—Xerollic Camborthids, coarse-loamy, mixed, mesic—85 percent

Contrasting inclusions:
- Inclusion 1: Bliss loam, 2 to 4 percent slopes—Haploxerolic Durorthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 2: McConnel cobly very fine sandy loam, 2 to 4 percent slopes—Xerollic Camborthids, sandy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Orovada loam, 2 to 4 percent slopes—Durixerolic Camborthids, coarse-loamy, mixed, mesic—5 percent

Characteristics of the Rebel Soil

Position on landscape: Inset fans
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Wyoming big sagebrush, bottlebrush squirreltail, Sandberg bluegrass

Typical profile

0 to 13 inches—loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 60 inches—sandy loam; 5 to 15 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 7.9 to 9.3 inches
Water-supplying capacity: About 8 inches
Runoff: Slow
Hydrologic group: B

Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: The slightly concave upper part of inset fans
Distinctive present vegetation: Bottlebrush squirreltail, Wyoming big sagebrush

Inclusion 2
Position on landscape: Narrow drainageways on inset fans
Distinctive present vegetation: Bottlebrush squirreltail, Wyoming big sagebrush

Inclusion 3
Position on landscape: Remnants of inset fans
Distinctive present vegetation: Bottlebrush squirreltail, Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat
Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Rebel soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Rebel soil for selected uses and practices

Range seeding: Fair—too arid
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Slope, erodes easily
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: IIc, irrigated, and Vlc, nonirrigated
Range site: 024X020N
482—Rebel loam, rarely flooded, 0 to 2 percent slopes

**Map Unit Setting**

*Position on landscape:* Inset fans  
*Elevation:* 4,000 to 5,000 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free period:* About 110 days

**Composition**

*Major component:*  
- Rebel loam, rarely flooded, 0 to 2 percent slopes—Xerolic Camborthids, coarse-loamy, mixed, mesic—90 percent  
*Contrasting inclusions:*  
- Inclusion 1: Xeric Torriorthents cobbly loam, occasionally flooded, 0 to 2 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—10 percent

**Characteristics of the Rebel Soil**

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—plane to concave  
*Dominant present vegetation:* Basin big sagebrush, spiny hopsage, Anderson peachbrush, black greasewood

**Typical profile**

0 to 13 inches—loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4  
13 to 60 inches—sandy loam; 5 to 15 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* 7.9 to 9.3 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—5

**Hazard of erosion:** By water—slight; by wind—slight  
**Shrink-swell potential:** Low  
**Corrosivity:** To steel—high; to concrete—low  
**Potential for frost action:** Moderate  
**Distinctive present vegetation:** Basin big sagebrush, black greasewood

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* Channels  
*Distinctive present vegetation:* Big sagebrush, black greasewood

**Major Uses**

**Current uses:** Rangeland, wildlife habitat  
**Foreseeable uses:** Rangeland, wildlife habitat, irrigated cropland

**Wildlife habitat elements**

**Suitability of the Rebel soil for named elements:** Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the Rebel soil for selected uses and practices**

*Range seeding:* Fair—too arid  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—frost action, flooding  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Fair—small stones  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Severe—piping  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily  
*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* IIc, irrigated, and Vlc, nonirrigated  
*Range site:* 024X041N

500—Pocker silty clay loam

**Map Unit Setting**

*Position on landscape:* Stream terraces  
*Elevation:* 4,000 to 4,800 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free period:* About 110 days
**Composition**

Major component:
- Pocker silty clay loam, 0 to 2 percent slopes—Typic Torrifuvents, fine, montmorillonitic (calcareous), mesic—85 percent

Contrasting inclusions:
- Inclusion 1: Aquentic Durorthids silt loam, 0 to 2 percent slopes—Aquentic Durorthids, loamy, mixed, mesic, shallow—5 percent
- Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durothic Torriorthents, fine-silty, mixed (calcareous), mesic—4 percent
- Inclusion 3: Raglan silt loam, 0 to 2 percent slopes—Durothic Torriorthents, fine-silty, mixed (calcareous), mesic—3 percent
- Inclusion 4: Needle Peak silt loam, slightly saline-sodic, 0 to 2 percent slopes—Aquic Torriorthents, fine-silty, mixed (calcareous), mesic—3 percent

**Characteristics of the Pocker Soil**

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Basin big sagebrush, black greasewood, basin wildrye

Typical profile

0 to 10 inches—silty clay loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); moderately sodic or strongly sodic (SAR 30 to 60); estimated Unified classification—CL; estimated AASHTO classification—A-7

10 to 60 inches—silty clay; 0 to 5 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 9.2); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 46 to 100); estimated Unified classification—CH; estimated AASHTO classification—A-7

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 8.9 to 10.2 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High

Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

**Contrasting Inclusions**

**Inclusion 1**
Position on landscape: Alluvial flats
Distinctive present vegetation: Alkali sacaton

**Inclusion 2**
Position on landscape: Alluvial flats
Distinctive present vegetation: Shadscale

**Inclusion 3**
Position on landscape: Fan skirts adjacent to stream terraces
Distinctive present vegetation: Shadscale

**Inclusion 4**
Position on landscape: Channels
Distinctive present vegetation: Basin big sagebrush, black greasewood

**Major Uses**

Current uses: Rangeland, wildlife habitat

**Wildlife habitat elements**

Suitability of the Pocker soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings and restrictive features of the Pocker soil for selected uses and practices**

Range seeding: Poor—excess salt, excess sodium, too arid
Daily cover for landfill: Poor—hard to pack
Shallow excavations: Moderate—too clayey, wetness
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Poor—low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt, excess sodium
Drainage: Deep to water
Irrigation: Percs slowly, erodes easily, excess salt
Terraces and diversions: Erodes easily, perc slowy

**Interpretive Groups**

Capability classification: IVs, irrigated, and VIIIs, nonirrigated
Range site: 024X006N
561—Sonoma silt loam, occasionally flooded, strongly saline-sodic

Map Unit Setting

Position on landscape: Flood plains
Elevation: 3,900 to 4,800 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

Composition

Major component:
\* Sonoma silt loam, occasionally flooded, strongly saline-sodic, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—85 percent

Contrasting inclusions:
\* Inclusion 1: Humboldt silty clay loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, montmorillonitic (calcareous), mesic—5 percent
\* Inclusion 2: Fluvaquentic Haploxerolls loam, frequently flooded, 0 to 2 percent slopes—Fluvaquentic Haploxerolls, coarse-loamy, mixed, mesic—5 percent
\* Inclusion 3: Sonoma silt loam, frequently flooded, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—5 percent

Characteristics of the Sonoma Soil

Position on landscape: Flood plains
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Alkali sacaton, inland saltgrass, black greasewood

Typical profile

0 to 9 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

9 to 60 inches—stratified silt loam to silty clay loam; massive, hard; strongly alkaline (pH 8.6); firm; nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

Soil and water features

Depth to a seasonal high water table: February through June—18 to 36 inches; rest of year—more than 60 inches
Flooding: Frequency—occasional; duration—brief; months—February through June

Permeability: Moderately slow
Available water capacity: 11.0 to 12.0 inches
Water-supplying capacity: About 16 inches
Runoff: Ponded
Hydrologic group: C
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Contrasting Inclusions

Inclusion 1
Position on landscape: The concave lower part of channels and oxbows
Distinctive present vegetation: Willow

Inclusion 2
Position on landscape: Convex areas adjacent to channels
Distinctive present vegetation: Willow

Inclusion 3
Position on landscape: Channels, oxbows
Distinctive present vegetation: Willow

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Sonoma soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Sonoma soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium
Daily cover for landfill: Fair—too clayey, wetness
Shallow excavations: Severe—wetness
Local roads and streets: Severe—low strength, flooding, frost action
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, too clayey
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—wetness, excess salt

Interpretive Groups

Capability classification: VIIw, nonirrigated
Range site: 024X007N
562—Sonoma silt loam, drained, strongly saline-sodic

Map Unit Setting

Position on landscape: Flood plains
Elevation: 3,800 to 4,800 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

Composition

Major component:
- Sonoma silt loam, drained, strongly saline-sodic, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—85 percent

Contrasting inclusions:
- Inclusion 1: Typic Torriorthents silt loam, 2 to 8 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—7 percent
- Inclusion 2: Yobe silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 3: Typic Torriorthents silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine, montmorillonitic (calcareous), mesic—3 percent

Characteristics of the Sonoma Soil

Position on landscape: Flood plains
Parent material: Mixed alluvium influenced by volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, basin wildrye, seepweed

Typical profile

0 to 9 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL; estimated AASHTO classification—A-6
9 to 60 inches—stratified silt loam to silty clay loam; massive; hard, firm; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

Soil and water features

Depth to a seasonal high water table: April through September—42 to 60 inches; rest of year—more than 60 inches
Flooding: None
Permeability: Moderately slow

Available water capacity: 11.0 to 12.0 inches
Water-supplying capacity: About 16 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: High

Contrasting Inclusions

Inclusion 1
Position on landscape: Depressional areas on flood plains
Distinctive present vegetation: Basin wildrye, black greasewood

Inclusion 2
Position on landscape: Slightly elevated areas on flood plains
Distinctive present vegetation: Basin big sagebrush, basin wildrye, Torrey quailbush

Inclusion 3
Position on landscape: Channels, oxbows
Distinctive present vegetation: Basin big sagebrush, basin wildrye

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Sonoma soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Sonoma soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium
Daily cover for landfill: Poor—excess salt
Shallow excavations: Moderate—wetness
Local roads and streets: Severe—low strength, frost action
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt, excess sodium

Interpretive Groups

Capability classification: Viliw, nonirrigated
Range site: 024X011N
563—Sondoa-Swingler-Isolede association

Map Unit Setting

Position on landscape: Stream terraces
Elevation: 3,800 to 4,300 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 52 degrees F
Frost-free period: About 120 days

Composition

Major components:
- Sondoa silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—45 percent
- Swingler silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—20 percent
- Isolede fine sand, 4 to 15 percent slopes—Typic Torripsamments, mixed, mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Fluvaquentic Haplaquolls silt loam, 0 to 2 percent slopes—Fluvaquentic Haplaquolls, fine, mixed (calcareous), mesic—5 percent
- Inclusion 2: Playas—5 percent
- Inclusion 3: Hawley sand, moderately wet, 0 to 4 percent slopes—Typic Torripsamments, mixed, mesic—3 percent
- Inclusion 4: Typic Torriorthents silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine, montmorillonitic (calcareous), mesic—2 percent

Characteristics of the Sondoa Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium and lacustrine sediments
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, seepweed, Bailey greasewood

Typical profile

0 to 6 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
6 to 60 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); moderately saline or strongly saline (more than 8 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 9.1 to 11.4 inches
Water-supplying capacity: About 5 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.49; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Swingler Soil

Position on landscape: Stream terraces
Parent material: Silty alluvium over mixed lacustrine deposits
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, seepweed, Bailey greasewood

Typical profile

0 to 6 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
6 to 60 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); moderately saline or strongly saline (more than 8 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 9.1 to 11.4 inches
Water-supplying capacity: About 5 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Isolede Soil

Position on landscape: Sand dunes
Parent material: Sandy eolian material
Slope features: Length—short; shape—convex

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 9.1 to 11.4 inches
Water-supplying capacity: About 5 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low
Dominant present vegetation: Black greasewood, hairy horsebrush, Indian ricegrass

Typical profile
0 to 3 inches—fine sand; single grain; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3
3 to 60 inches or more—fine sand; single grain; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very rapid
Available water capacity: 3.6 to 5.4 inches
Water-supplying capacity: About 4 inches
Runoff: Very slow
Hydrologic group: A
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—1
Hazard of erosion: By water—slight; by wind—severe
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions
Inclusion 1
Position on landscape: Smooth deltas
Distinctive present vegetation: Saltcedar, alkali sacaton

Inclusion 2
Position on landscape: Smooth depressions on the lower stream terraces
Distinctive present vegetation: Barren

Inclusion 3
Position on landscape: Smooth sand sheets
Distinctive present vegetation: Nevada dalea

Inclusion 4
Position on landscape: The smooth upper part of stream terraces
Distinctive present vegetation: Shadscale

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements
Suitability of the Sonda soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Isolde soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Sonda soil for selected uses and practices
Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—low strength
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt

Ratings and restrictive features of the Swingler soil for selected uses and practices
Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—low strength, shrink-swell
Roadfill: Fair—low strength, thin layer, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping, excess salt, excess sodium

Ratings and restrictive features of the Isolde soil for selected uses and practices
Range seeding: Poor—too arid, soil blowing
Daily cover for landfill: Poor—seepage, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—slope
Roadfill: Good
Sand: Probable source
Gravel: Improbable source—too sandy
Topsoil: Poor—too sandy
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage, piping
Drainage: Deep to water
Irrigation: Droughty, fast intake, slope
Terraces and diversions: Slope, too sandy, soil blowing

**Interpretive Groups**

**Capability classification:** Sondoa—VIIa, nonirrigated; Swingler—VIIa, nonirrigated; Isolde—IVa, irrigated, and VIIa, nonirrigated

**Range site:** Sondoa—027X025N; Swingler—027X025N; Isolde—027X016N

581—Sumine-Gosumi-Nomara association

**Map Unit Setting**

Position on landscape: Mountains  
Elevation: 5,500 to 7,000 feet  
Average annual precipitation: About 11 inches  
Average annual air temperature: About 43 degrees F  
Frost-free period: About 85 days

**Composition**

**Major components:**  
- Sumine cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—40 percent  
- Gosumi stony loam, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—25 percent  
- Nomara stony silt loam, 30 to 50 percent slopes—Calcic Pachic Argixerolls, loamy-skeletal, mixed, frigid—20 percent

**Contrasting inclusions:**  
- Inclusion 1: Cleavage extremely gravelly loam, 4 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—7 percent  
- Inclusion 2: Rock outcrop—4 percent  
- Inclusion 3: Xeric Torriorthents very cobbly loam, 30 to 50 percent slopes—Xeric Torriorthents, clayey-skeletal, montmorillonitic (calcareous), frigid—3 percent  
- Inclusion 4: Fluventic Haploxerolls loam, 0 to 4 percent slopes—Fluventic Haploxerolls, fine-loamy, mixed, frigid—1 percent

**Characteristics of the Sumine Soil**

Position on landscape: South-facing side slopes of mountains  
Parent material: Kind—residueum, colluvium; source—quartz, grit, sandstone, shale, limestone  
Slope features: Length—long; shape—convex  
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, scattered Utah juniper in some areas  
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—20

**Typical profile**

0 to 2 inches—cobbly loam; 20 to 30 percent cobbles and stones and 15 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
2 to 22 inches—very gravelly clay loam; 15 to 40 percent cobbles and stones and 40 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7  
22 inches—unweathered bedrock

**Soil and water features**

Depth to bedrock: 20 to 40 inches  
Depth to a seasonal high water table: More than 60 inches  
Flooding: None  
Permeability: Moderate  
Available water capacity: 2.2 to 2.9 inches  
Water-supplying capacity: About 10 inches  
Runoff: Rapid  
Hydrologic group: C  
Erosion factors (surface layer): K value—.24; T value—2; wind erodibility group—6  
Hazard of erosion: By water—severe; by wind—slight  
Shrink-swell potential: Low  
Corrosivity: To steel—moderate; to concrete—low  
Potential for frost action: Moderate

**Characteristics of the Gosumi Soil**

Position on landscape: North-facing side slopes of mountains  
Parent material: Kind—residueum, colluvium; source—quartz, grit, sandstone, shale, limestone  
Slope features: Length—long; shape—convex  
Dominant present vegetation: Low sagebrush  
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—20

**Typical profile**

0 to 8 inches—stony loam; 5 to 10 percent cobbles and stones and 15 to 30 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
8 to 32 inches—very gravelly clay; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7
32 to 42 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); massive; hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1
42 to 50 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones and 50 to 75 percent pebbles (by weight); hard, friable; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1
50 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 40 to 60 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 4.9 to 6.6 inches
Water-supplying capacity: About 10 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.37; T value—3; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Nomara Soil

Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum, colluvium; source—andesite, quartzite, limestone, slate, argillite
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, snowberry
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—20

Typical profile
0 to 4 inches—stony silt loam; 5 to 25 percent cobbles and stones and 10 to 30 percent pebbles (by weight); clayey structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
4 to 19 inches—gravelly silt loam; 0 to 10 percent cobbles and stones and 10 to 25 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
19 to 40 inches—very gravelly loam; 15 to 30 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; very hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6
40 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 4.8 to 5.9 inches
Water-supplying capacity: About 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.28; T value—2; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex crests and shoulder slopes of mountains
Distinctive present vegetation: Idaho fescue, low sagebrush

Inclusion 2
Position on landscape: The crests and upper side slopes of mountains
Distinctive present vegetation: Barren

Inclusion 3
Position on landscape: Eroded side slopes of mountains
Distinctive present vegetation: Utah juniper

Inclusion 4
Position on landscape: Drainageways
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Sumine soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Gosumi soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Nomara soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the Sumine soil for selected uses and practices**

Range seeding: Poor—small stones, erodes easily, slope
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones

Range seeding: Poor—erodes easily, slope
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, too clayey, area reclaim
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—thin layer

**Ratings and restrictive features of the Nomara soil for selected uses and practices**

Range seeding: Poor—erodes easily, slope
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope, frost action
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

**Interpretive Groups**

Capability classification: Sumine—VIlS, nonirrigated; Gosumi—VIlS, nonirrigated; Nomara—VIlS, nonirrigated

Range site: Sumine—024X029N; Gosumi—024X027N; Nomara—024X021N

591—Trunk-Hoot association

**Map Unit Setting**

Position on landscape: Mountains
Elevation: 4,200 to 5,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

**Composition**

Major components:
- Trunk very cobbly loam, 30 to 50 percent slopes—Xerolic Hapludands, fine, montmorillonitic, mesic—50 percent
- Hoot very cobbly loam, 30 to 50 percent slopes—Lithic Hapludands, loamy-skeletal, mixed, mesic—35 percent

Contrasting inclusions:
- Inclusion 1: Xerolic Hapludands very cobbly loam, 15 to 30 percent slopes—Xerolic Hapludands, loamy-skeletal, mixed, mesic—6 percent
- Inclusion 2: Lithic Xerolic Hapludands very cobbly loam, 4 to 15 percent slopes—Lithic Xerolic Hapludands, loamy-skeletal, mixed, mesic—4 percent
- Inclusion 3: Xeric Torriorthents cobbly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—3 percent
- Inclusion 4: Lithic Torriorthents very cobbly loam, 30 to 50 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—2 percent

**Characteristics of the Trunk Soil**

Position on landscape: North- and east-facing side slopes of mountains
Parent material: Kind—residuum; source—chert, quartzite, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, Sandberg bluegrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—35

**Typical profile**

0 to 3 inches—very cobbly loam; 30 to 45 percent cobbles and stones and 25 to 50 percent pebbles (by weight); slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, SM-SC, SC, GC; estimated AASHTO classification—A-4, A-6

3 to 30 inches—gravelly clay; 0 to 10 percent cobbles...
and stones and 40 to 50 percent pebbles (by weight); subangular blocky structure; very hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7

30 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 22 to 38 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.9 to 3.8 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Hoot Soil

Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residual; source—andesite, rhyolite, quartzite, phyllite
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—55

Typical profile

0 to 4 inches—very cobbly loam; 25 to 45 percent cobbles and stones and 35 to 55 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4

4 to 14 inches—extremely gravelly clay loam; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); subangular blocky structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2

14 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 10 to 20 inches

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 0.8 inch to 1.2 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex foot slopes
Distinctive present vegetation: Sandberg bluegrass, Wyoming big sagebrush

Inclusion 2
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Inclusion 3
Position on landscape: Concave toe slopes adjacent to channels
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Inclusion 4
Position on landscape: Convex, eroded, south-facing mountainsides
Distinctive present vegetation: Bottlebrush squirreltail, shadscale

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Trunk soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—poor
Suitability of the Hoot soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Trunk soil for selected uses and practices

Range seeding: Poor—large stones
Daily cover for landfill: Poor—depth to bedrock, hard to pack, small stones
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—low strength, shrink-swell, slope
Roadfill: Poor—depth to bedrock, low strength, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Hoot soil for selected uses and practices
Range seeding: Poor—small stones, too arid
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, slope, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups
Capability classification: Trunk—VIIIs, nonirrigated; Hoot—VIIIs, nonirrigated
Range site: Trunk—024X005N; Hoot—024X002N

592—Trunk-Pocan association

Map Unit Setting
Position on landscape: Mountains
Elevation: 4,500 to 6,000 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition
Major components:
- Trunk stony loam, 30 to 50 percent slopes—Xerollic Hapludands, fine, montmorillonitic, mosaics—45 percent
- Pocan stony loam, 30 to 50 percent slopes—Xerollic Camborthids, fine-loamy, mixed, mesic—40 percent
Contrasting inclusions:
- Inclusion 1: Golhum very cobbly loam, 30 to 50 percent slopes—Aridic Calcic Argixerolls, clayey-skeletal, montmorillonitic, frigid—6 percent
- Inclusion 2: Lithic Argixerolls very cobbly loam, 30 to 50 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—5 percent
- Inclusion 3: Rock outcrop—3 percent
- Inclusion 4: Fluventic Haploxerolls loam, 0 to 4 percent slopes—Fluventic Haploxerolls, fine-loamy, mixed, mesic—1 percent

Characteristics of the Trunk Soil
Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—quartzite, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, downy rabbitbrush, Thurber needlegrass

Typical profile
0 to 3 inches—stony loam; 5 to 15 percent cobbles and stones and 20 to 40 percent pebbles (by weight); granular structure; slightly hard, friable, neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, GM-GC, CL, CL-ML; estimated AASHTO classification—A-4, A-6
3 to 30 inches—gravelly clay; 0 to 10 percent cobbles and stones and 20 to 50 percent pebbles (by weight); subangular blocky structure; very hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7
30 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 22 to 38 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.9 to 3.8 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.24; T value—2; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Pocan Soil
Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—quartzite, shale
Slope features: Length—long; shape—concave
Dominant present vegetation: Wyoming big sagebrush, downy rabbitbrush, Thurber needlegrass
Rock fragments on the surface: Kind—cobbles, stones; percentage of surface covered—10
Typical profile

0 to 10 inches—stony loam; 5 to 10 percent cobbles and stones and 0 to 10 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nondoic (SAR less than 13); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

10 to 26 inches—gravely loam; 10 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nondoic (SAR less than 13); estimated Unified classification—SC, GC, CL; estimated AASHTO classification—A-6

26 to 48 inches—gravely loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); nondoic (SAR less than 13); estimated Unified classification—SC, GC; estimated AASHTO classification—A-6

48 inches—unweathered bedrock

Soil and water features

*Depth to bedrock:* 40 to 60 inches
*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Moderate
*Available water capacity:* 4.7 to 6.1 inches
*Water-supplying capacity:* About 8 inches
*Runoff:* Rapid
*Hydrologic group:* B
*Erosion factors (surface layer):* K value—.43; T value—3; wind erodibility group—5
*Hazard of erosion:* By water—severe; by wind—slight
*Shrink-swell potential:* Moderate
*Corrosivity:* To steel—high; to concrete—low
*Potential for frost action:* Moderate

Contrasting Inclusions

**Inclusion 1**
*Position on landscape:* Concave side slopes on mountains
*Distinctive present vegetation:* Mountain big sagebrush

**Inclusion 2**
*Position on landscape:* Convex shoulder slopes of mountains
*Distinctive present vegetation:* Snowberry, mountain big sagebrush

**Inclusion 3**
*Position on landscape:* Scattered small peaks and ridges

*Distinctive present vegetation:* Barren

**Inclusion 4**
*Position on landscape:* Toe slopes adjacent to channels
*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

Major Uses

**Current uses:** Rangeland, wildlife habitat

Wildlife habitat elements

**Suitability of the Trunk soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Suitability of the Pocan soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Trunk soil for selected uses and practices

*Range seeding:* Poor—small stones, erodes easily
*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones
*Shallow excavations:* Severe—depth to bedrock, slope
*Local roads and streets:* Severe—low strength, slope, shrink-swell
*Roadfill:* Poor—depth to bedrock, slope, low strength
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—slope, small stones
*Pond reservoir areas:* Severe—slope
*Embankments, dikes, and levees:* Severe—thin layer

Ratings and restrictive features of the Pocan soil for selected uses and practices

*Range seeding:* Poor—erodes easily
*Daily cover for landfill:* Poor—slope
*Shallow excavations:* Severe—slope
*Local roads and streets:* Severe—slope
*Roadfill:* Poor—slope
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—small stones, slope
*Pond reservoir areas:* Severe—slope
*Embankments, dikes, and levees:* Moderate—thin layer

Interpretive Groups

**Capability classification:** Trunk—VIIe, nonirrigated; Pocan—VIIa, nonirrigated
*Range site:* Trunk—024X005N; Pocan—024X005N

596—Trunk-Burrita association

**Map Unit Setting**

*Position on landscape:* Mountains
Elevation: 4,500 to 6,000 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
• Trunk very cobly loam, 30 to 50 percent slopes—Xerolic Hapludands, fine, montmorillonitic, mesic—60 percent
• Burrita very cobly loam, 4 to 15 percent slopes—Lithic Xerolic Hapludands, clayey-skeletal, montmorillonitic, mesic—25 percent
Contrasting inclusions:
• Inclusion 1: Typic Nadurargids very cobly loam, 15 to 30 percent slopes—Typic Nadurargids, fine, montmorillonitic, mesic—10 percent
• Inclusion 2: Rock outcrop—5 percent

Characteristics of the Trunk Soil

Position on landscape: Side slopes on mountains
Parent material: Kind—residuum, colluvium; source—chert, quartzite, sandstone, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, cheatgrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—40

Typical profile
0 to 3 inches—very cobly loam; 30 to 45 percent cobbles and stones and 25 to 50 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4, A-6
3 to 30 inches—gravelly clay; 0 to 10 percent cobbles and stones and 40 to 50 percent pebbles (by weight); subangular blocky structure; very hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7
30 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 22 to 38 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.9 to 3.8 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid

Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Burrita Soil

Position on landscape: Crests of mountains
Parent material: Kind—residuum, colluvium; source—chert, quartzite, sandstone, shale
Slope features: Length—short; shape—convex
Dominant present vegetation: Wyoming big sagebrush, bottlebrush squirreltail, cheatgrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—50

Typical profile
0 to 8 inches—very cobly loam; 25 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4
8 to 17 inches—very gravelly clay; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm, strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7
17 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 1.4 to 1.8 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid

Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—1; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex foot slopes of mountains
Distinctive present vegetation: Shadscale
Inclusion 2
Position on landscape: Scattered small peaks and ridges
Distinctive present vegetation: Barren

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Trunk soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Burrita soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Trunk soil for selected uses and practices

Range seeding: Poor—large stones
Daily cover for landfill: Poor—depth to bedrock, hard to pack, small stones
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—low strength, shrink-swell, slope
Roadfill: Poor—depth to bedrock, low strength, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Burrita soil for selected uses and practices

Range seeding: Poor—droughty, large stones
Daily cover for landfill: Poor—depth to bedrock, small stones
Shallow excavations: Severe—depth to bedrock
Local roads and streets: Severe—depth to bedrock
Roadfill: Poor—depth to bedrock
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones
Topsoil: Poor—depth to bedrock, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—large stones

Interpretive Groups

Capability classification: Trunk—Vlls, nonirrigated; Burrita—Vlls, nonirrigated
Range site: Trunk—024X005N; Burrita—024X005N

598—Trunk-Oxcorel Variant-Bojo association

Map Unit Setting

Position on landscape: Mountains

Elevation: 4,500 to 6,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Trunk very cobbley loam, 30 to 50 percent slopes—Xerolic Haplargids, fine, montmorillonitic, mesic—45 percent
- Oxcorel Variant cobbley loam, 30 to 50 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—20 percent
- Bojo very cobbley loam, 4 to 15 percent slopes—Lithic Haplargids, loamy, mixed, mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Xerolic Haplargids very cobbley loam, 15 to 30 percent slopes—Xerolic Haplargids, loamy-skeletal, mixed, mesic—10 percent
- Inclusion 2: Xeric Torriorthents very cobbley loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent
- Inclusion 3: Allow very gravelly loam, 30 to 50 percent slopes—Lithic Xerolic Haplargids, loamy-skeletal, mixed, mesic—1 percent
- Inclusion 4: Rock outcrop—1 percent

Characteristics of the Trunk Soil

Position on landscape: The upper side slopes of mountains
Parent material: Kind—residuum; source—quartzite, chert, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, Sandberg bluegrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—25

Typical profile

0 to 3 inches—very cobbley loam; 30 to 45 percent cobbles and stones and 25 to 50 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, SM-SC, SC, GC; estimated AASHTO classification—A-4, A-6
3 to 30 inches—gravely clay; 0 to 10 percent cobbles and stones and 40 to 50 percent pebbles (by weight); subangular blocky structure; very hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7
30 inches—unweathered bedrock
Soil and water features

Depth to bedrock: 22 to 38 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.9 to 3.8 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Oxcord Variant Soil

Position on landscape: The lower side slopes of mountains
Parent material: Kind—residueum; source—chert, shale, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bottlebrush squirreltail
Rock fragments on the surface: Kind—cobble, gravel, stones; percentage of surface covered—35

Typical profile

0 to 4 inches—cobbly loam; 15 to 40 percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
4 to 32 inches—clay; 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
32 to 55 inches—clay loam; 10 to 20 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—CL; estimated AASHTO classification—A-6
55 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 40 to 60 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.3 to 1.7 inches
Water-supplying capacity: About 4 to 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight

Characteristics of the Bojo Soil

Position on landscape: Crests of mountains
Parent material: Kind—residueum; source—metamorphic rocks
Slope features: Length—short; shape—convex
Dominant present vegetation: Wyoming big sagebrush, shadscale, bud sagebrush, spiny hopsage, bottlebrush squirreltail
Rock fragments on the surface: Kind—cobble, gravel, stones; percentage of surface covered—45

Typical profile

0 to 3 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
3 to 10 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 15 to 35 percent pebbles (by weight); subangular blocky structure; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6
10 inches—unweathered bedrock


Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* The lower side slopes of mountains
*Distinctive present vegetation:* Bottlebrush squirreltail, Wyming big sagebrush

**Inclusion 2**
*Position on landscape:* Foot slopes adjacent to channels
*Distinctive present vegetation:* Pine bluegrass, basin big sagebrush

**Inclusion 3**
*Position on landscape:* Convex shoulder slopes
*Distinctive present vegetation:* Black sagebrush

**Inclusion 4**
*Position on landscape:* Scattered small peaks and ridges
*Distinctive present vegetation:* Barren

**Major Uses**

*Current uses:* Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Trunk soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Oxcorel Variant soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Bojo soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings and restrictive features of the Trunk soil for selected uses and practices**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—depth to bedrock, hard to pack, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—depth to bedrock, low strength, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings and restrictive features of the Oxcorel soil for selected uses and practices**

*Range seeding:* Poor—too arid, erodes easily

*Daily cover for landfill:* Poor—slope, thin layer

*Shallow excavations:* Severe—slope

*Local roads and streets:* Poor—low strength, slope, shrink-swell

*Roadfill:* Poor—thin layer, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—thin layer, slope, excess sodium

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Moderate—thin layer, excess sodium

**Ratings and restrictive features of the Bojo soil for selected uses and practices**

*Range seeding:* Poor—droughty, small stones, too arid

*Daily cover for landfill:* Poor—depth to bedrock

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, depth to bedrock

*Pond reservoir areas:* Severe—depth to bedrock

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Trunk—VII, nonirrigated; Oxcorel Variant—VII, nonirrigated; Bojo—VII, nonirrigated

*Range site:* Trunk—024X005N; Oxcorel Variant—024X002N; Bojo—024X026N

**599—Trunk-Burrita-Rock outcrop association**

**Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 4,500 to 6,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free period:* About 110 days

**Composition**

*Major components:*
  * Trunk stony loam, 30 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, mesic—40 percent
  * Burrita very stony loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—25 percent
  * Rock outcrop—20 percent

*Contrasting inclusions:*
  * Inclusion 1: Lithic Xerollic Haplargids very cobbly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—5 percent
• Inclusion 2: Xeric Torriorthents stony loam, 15 to 30 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
• Inclusion 3: Typic Torriorthents very stony loam, 30 to 50 percent slopes—Typic Torriorthents, clayey-skeletal, montmorillonitic, mesic—5 percent

**Characteristics of the Trunk Soil**

*Position on landscape:* Side slopes of mountains  
*Parent material:* Kind—residuum; source—quartzite, chert, shale  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail

**Typical profile**

0 to 8 inches—very stony loam; 25 to 40 percent cobbles and stones and 35 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4  
8 to 17 inches—very gravelly clay; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7  
17 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 14 to 20 inches  
*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Slow  
*Available water capacity:* 1.4 to 1.8 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential for frost action:* Low

**Characteristics of the Rock Outcrop**

*Position on landscape:* Crests and side slopes of mountains  
*Dominant present vegetation:* Barren

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* Convex shoulder slopes of mountains  
*Distinctive present vegetation:* Low sagebrush

**Inclusion 2**

*Position on landscape:* Concave side slopes of mountains  
*Distinctive present vegetation:* Bottlebrush squirreltail, shadscale
Inclusion 3

Position on landscape: Convex foot slopes of mountains
Distinctive present vegetation: Shadscale

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Trunk soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Burrita soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Trunk soil for selected uses and practices

Range seeding: Poor—small stones, erodes easily
Daily cover for landfill: Poor—depth to bedrock, hard to pack, small stones
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Roadfill: Poor—depth to bedrock, slope, low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—slope, small stones
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Burrita soil for selected uses and practices

Range seeding: Poor—droughty, large stones
Daily cover for landfill: Poor—depth to bedrock, small stones
Shallow excavations: Severe—depth to bedrock
Local roads and streets: Severe—depth to bedrock
Roadfill: Poor—depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—large stones

Interpretive Groups

Capability classification: Trunk—VIIe, nonirrigated; Burrita—VIII, nonirrigated; Rock outcrop—VIII
Range site: Trunk—024X005N; Burrita—024X005N

600—Valmy fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

Position on landscape: Inset fans

Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Valmy fine sandy loam, 0 to 2 percent slopes—Durorthic Torriorthents, coarse-loamy, mixed (calcareous), mesic—90 percent
Contrasting inclusions:
• Inclusion 1: Durixerollic Camborthents fine sandy loam, 0 to 2 percent slopes—Duricerolic Camborthents, coarse-silty, mixed, mesic—5 percent
• Inclusion 2: Weso very fine sandy loam, 0 to 2 percent slopes—Duric Camborthents, coarse-loamy, mixed, mesic—5 percent

Characteristics of the Valmy Soil

Position on landscape: Inset fans
Parent material: Mixed alluvium with a loess cap high in content of volcanic ash
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Black greasewood, basin wildrye, basin big sagebrush
Rock fragments on the surface: Kind—gravel; percentage of surface covered—10

Typical profile

0 to 3 inches—fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 20 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-2, A-4
3 to 60 inches—stratified very fine sandy loam to gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2, A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 9.0 to 10.2 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—32; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—moderate
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly concave inset fans adjacent to channels
Distinctive present vegetation: Black greasewood, basin wildrye

Inclusion 2
Position on landscape: Slightly convex fan skirts
Distinctive present vegetation: Shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Valmy soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Valmy soil for selected uses and practices

Range seeding: Poor—excess salt, too arid
Daily cover for landfill: Fair—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improvable source—excess fines
Gravel: Improvable source—excess fines
Topsoil: Poor—small stones
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Moderate—seepage, piping
Drainage: Deep to water
Irrigation: Droughty, soil blowing
Terraces and diversions: Soil blowing

Interpretive Groups

Capability classification: IIs, irrigated, and VIIc, nonirrigated
Range site: 024X022N

610—Weso very fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

Position on landscape: Fan skirts

Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Weso very fine sandy loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—90 percent
Contrasting inclusions:
• Inclusion 1: Yipor silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—6 percent
• Inclusion 2: Valmy fine sandy loam, 0 to 2 percent slopes—Durothidic Torriorthents, coarse-loamy, mixed (calcareous), mesic—2 percent
• Inclusion 3: Dun Glen silt loam, frequently flooded, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—2 percent

Characteristics of the Weso Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bottlebrush squirreltail, bud sagebrush

Typical profile

0 to 7 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
7 to 12 inches—very fine sandy loam; 5 to 15 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, CL-ML, SM, SM-SC; estimated AASHTO classification—A-4
12 to 60 inches—very fine sandy loam; 5 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 8.0 to 10.4 inches
Water-supplying capacity: About 7 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.49; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly convex fan skirts
Distinctive present vegetation: Black greasewood

Inclusion 2
Position on landscape: Slightly concave fan skirts
Distinctive present vegetation: Black greasewood, basin big sagebrush

Inclusion 3
Position on landscape: Slightly concave fan skirts
Distinctive present vegetation: Winterfat

Major Uses

Current uses: Rangeland, wildlife habitat
Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Weso soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Weso soil for selected uses and practices

Range seeding: Poor—too arid, excess salt
Daily cover for fall till: Fair—too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones, area reclaim, thin layer
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess salt
Drainage: Deep to water
Irrigation: Excess salt
Terraces and diversions: Erodes easily, too sandy

Interpretive Groups

Capability classification: IIc, irrigated, and VIIc, nonirrigated

Range site: 024X002N

614—Weso silt loam, moderately saline-sodic, 0 to 2 percent slopes

Map Unit Setting

Position on landscape: Fan skirts
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Weso silt loam, moderately saline-sodic, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—90 percent
Contrasting inclusions:
• Inclusion 1: Weso silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent
• Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durothidic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

Characteristics of the Weso Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Black greasewood, bud sagebrush, horsebrush

Typical profile

0 to 7 inches—silt loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
7 to 60 inches or more—very fine sandy loam; 5 to 25 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.7); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimatedUnified classification—SM, ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 8.0 to 10.4 inches
Water-supplying capacity: About 7 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly convex fan skirts
Distinctive present vegetation: Bud sagebrush, shadscale, bottlebrush squirreltail

Inclusion 2
Position on landscape: Slightly concave fan skirts
Distinctive present vegetation: Shadscale, black greasewood

Major Uses
Current uses: Rangeland, wildlife habitat
Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements
Suitability of the Weso soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Weso soil for selected uses and practices
Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Good
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Drainage: Deep to water
Irrigation: Excess salt
Terraces and diversions: Erodes easily

Interpretive Groups
Capability classification: IIs, irrigated, and VIIIs, nonirrigated
Range site: 024X003N

615—Weso-Misad-Beoska association

Map Unit Setting
Position on landscape: Fan piedmonts
Elevation: 4,100 to 4,650 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 7 inches
Frost-free period: About 110 days

Composition
Major components:
• Weso very fine sandy loam, 2 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—45 percent
• Misad gravelly very fine sandy loam, 2 to 8 percent slopes—Durothic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—25 percent
• Beoska gravelly very fine sandy loam, 4 to 15 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—15 percent

Contrasting inclusions:
• Inclusion 1: Misad very fine sandy loam, moderately saline-alkali, 4 to 15 percent slopes—Durothic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
• Inclusion 2: Whirlo gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—4 percent
• Inclusion 3: Durixerollic Camborthids gravelly very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, loamy-skeletal, mixed, mesic—4 percent
• Inclusion 4: Ectic Durothids gravelly very fine sandy loam, 2 to 8 percent slopes—Etic Durothids, loamy-skeletal, mixed, mesic—2 percent

Characteristics of the Weso Soil
Position on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, spiny hopsage

Typical profile
0 to 7 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
7 to 60 inches—very fine sandy loam; 5 to 15 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.7); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—ML, CL-ML, SM, SM-SC; estimated AASHTO classification—A-4

Soil and water features

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Moderate

**Available water capacity:** 8.0 to 10.0 inches

**Water-supplying capacity:** About 7 inches

**Runoff:** Slow

**Hydrologic group:** B

**Erosion factors (surface layer):** K value—.49; T value—5; wind erodibility group—3

**Hazard of erosion:** By water—slight; by wind—slight

**Shrink-swell potential:** Low

**Corrosivity:** To steel—high; to concrete—low

**Potential for frost action:** Low

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**Characteristics of the Misad Soil**

**Position on landscape:** Inset fans

**Parent material:** Loess over mixed alluvium

**Slope features:** Length—long; shape—slightly concave

**Dominant present vegetation:** Shadscale, bud sagebrush, bottlebrush squirreltail, spiny hopsage

**Typical profile**

0 to 11 inches—gravely very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-2, A-4

11 to 28 inches—stratified fine sandy loam to very gravelly sandy loam; 5 to 10 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

28 to 60 inches—extremely gravelly loamy sand; 5 to 10 percent cobbles and stones and 60 to 80 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

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**Flooding:** None

**Permeability:** Moderately rapid

**Available water capacity:** 3.1 to 4.5 inches

**Water-supplying capacity:** About 7 inches

**Runoff:** Medium

**Hydrologic group:** B

**Erosion factors (surface layer):** K value—.24; T value—5; wind erodibility group—4

**Hazard of erosion:** By water—slight; by wind—slight

**Shrink-swell potential:** Low

**Corrosivity:** To steel—high; to concrete—low

**Potential for frost action:** Low

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**Characteristics of the Beoska Soil**

**Position on landscape:** Fan piedmont remnants

**Parent material:** Mixed alluvium influenced by loess and volcanic ash

**Slope features:** Length—long; shape—convex

**Dominant present vegetation:** Shadscale, bud sagebrush, bottlebrush squirreltail, spiny hopsage

**Rock fragments on the surface:** Kind—gravely, cobbles; percentage of surface covered—32

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**Typical profile**

0 to 13 inches—gravely very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

13 to 25 inches—clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.7); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

25 to 44 inches—gravely sandy loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

44 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1
Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.0 to 8.3 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex, dissected fan skirts
Distinctive present vegetation: Black greasewood

Inclusion 2
Position on landscape: Concave inset fans
Distinctive present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Inclusion 3
Position on landscape: Drainageways
Distinctive present vegetation: Wyoming big sagebrush

Inclusion 4
Position on landscape: The convex upper part of inset fans
Distinctive present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Weso soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the Misad soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Beoska soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Weso soil for selected uses and practices

Range seeding: Poor—too arid, too crusty

Daily cover for landfill: Fair—too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones, area reclaim, thin layer
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess salt
Drainage: Deep to water
Irrigation: Excess salt, slope
Terraces and diversions: Erodes easily

Ratings and restrictive features of the Misad soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, too crusty

Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty, soil blowing, slope
Terraces and diversions: Too sandy, soil blowing

Ratings and restrictive features of the Beoska soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium

Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—slope
Local roads and streets: Moderate—slope
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—area reclaim, small stones, excess salt
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—excess sodium, excess salt
Drainage: Deep to water
Irrigation: Slope, excess sodium, excess salt
Terraces and diversions: Erodes easily, slope

Interpretive Groups

Capability classification: Weso—IIIe, irrigated, and VIIc, nonirrigated; Misad—IIIe, irrigated, and VIIs, nonirrigated; Beoska—IVe, irrigated, and VIIe, nonirrigated

Range site: Weso—024X002N; Misad—024X002N; Beoska—024X002N
652—Burrita-Hoot-Rock outcrop association

Map Unit Setting
Position on landscape: Mountains
Elevation: 4,500 to 6,000 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

Composition
Major components:
- Burrita very cobbly loam, 30 to 50 percent stones—Lithic Xerollic Haplagnids, clayey-skeletal, montmorillonitic, mesic—40 percent
- Hoot very cobbly loam, 30 to 50 percent slopes—Lithic Haplagnids, loamy-skeletal, mixed, mesic—25 percent
- Rock outcrop—20 percent

Contrasting inclusions:
- Inclusion 1: Trunk very cobbly loam, 30 to 50 percent slopes—Xerollic Haplagnids, fine, montmorillonitic, mesic—10 percent
- Inclusion 2: Xerollic Haplagnids, very cobbly loam, 30 to 50 percent slopes—Xerollic Haplagnids, loamy-skeletal, mixed, mesic—5 percent

Characteristics of the Burrita Soil
Position on landscape: North-, east-, and west-facing side slopes of mountains
Parent material: Kind—residuum; source—volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—55

Typical profile
0 to 8 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4
8 to 17 inches—very gravelly clay; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7
17 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 1.4 to 1.8 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—0.15; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Hoot Soil
Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—55

Typical profile
0 to 4 inches—very cobbly loam; 25 to 45 percent cobbles and stones and 35 to 55 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4
4 to 14 inches—extremely gravelly clay loam; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); subangular blocky structure; hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2
14 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 0.8 inch to 1.2 inches
Water-supplying capacity: About 6 inches
Runoff: Rapid  
Hydrologic group: D  
Erosion factors (surface layer): K value—10; T value—1; wind erodibility group—8  
Hazard of erosion: By water—moderate; by wind—slight  
Shrink-swell potential: Low  
Corrosivity: To steel—high; to concrete—low  
Potential for frost action: Low  

Characteristics of the Rock Outcrop  
Position on landscape: Crests and side slopes of mountains  
Dominant present vegetation: Barren  

Contrasting Inclusions  
Inclusion 1  
Position on landscape: The convex lower part of mountainsides  
Distinctive present vegetation: Wyoming big sagebrush, bottlebrush squirreltail  

Inclusion 2  
Position on landscape: Concave side slopes of mountains  
Distinctive present vegetation: Wyoming big sagebrush, bottlebrush squirreltail  

Major Uses  
Current uses: Rangeland, wildlife habitat  

Wildlife habitat elements  
Suitability of the Burrita soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
Suitability of the Hoot soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  

Ratings and restrictive features of the Burrita soil for selected uses and practices  
Range seeding: Poor—droughty, large stones  
Daily cover for landfill: Poor—depth to bedrock, slope, small stones  
Shallow excavations: Severe—depth to bedrock, slope  
Local roads and streets: Severe—depth to bedrock, slope  
Roadfill: Poor—depth to bedrock, large stones, slope  
Sand: Improbable source—excess fines, large stones  
Gravel: Improbable source—excess fines, large stones  
Topsoil: Poor—depth to bedrock, small stones, slope  
Pond reservoir areas: Severe—depth to bedrock, slope  
Embankments, dikes, and levees: Severe—large stones  

Ratings and restrictive features of the Hoot soil for selected uses and practices  
Range seeding: Poor—too arid, large stones  

Daily cover for landfill: Poor—depth to bedrock, small stones, slope  
Shallow excavations: Severe—depth to bedrock, slope  
Local roads and streets: Severe—depth to bedrock, slope  
Roadfill: Poor—depth to bedrock, slope  
Sand: Improbable source—excess fines  
Gravel: Improbable source—excess fines  
Topsoil: Poor—depth to bedrock, small stones, slope  
Pond reservoir areas: Severe—depth to bedrock, slope  
Embankments, dikes, and levees: Severe—thin layer  

Interpretive Groups  
Capability classification: Burrita—VIIe, nonirrigated; Hoot—VIIe, nonirrigated; Rock outcrop—VIIe  
Range site: Burrita—024X005N; Hoot—024X002N  

653—Burrita-Burnborough association  

Map Unit Setting  
Position on landscape: Mountains  
Elevation: 5,500 to 6,500 feet  
Average annual precipitation: About 12 inches  
Average annual air temperature: About 46 degrees F  
Frost-free period: About 90 days  

Composition  
Major components:  
• Burrita very cobbly loam, 50 to 75 percent slopes—Lithic Xerolic Haplargids, clayey-skeletal, montmorillonitic, mesic—45 percent  
• Burnborough very gravelly loam, 50 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—40 percent  

Contrasting inclusions:  
• Inclusion 1: Burrita very cobbly loam, 4 to 15 percent slopes—Lithic Xerolic Haplargids, clayey-skeletal, montmorillonitic, mesic—5 percent  
• Inclusion 2: Roca very cobbly loam, 30 to 50 percent slopes—Xerolic Haplargids, clayey-skeletal, montmorillonitic, frigid—5 percent  
• Inclusion 3: Rock outcrop—4 percent  
• Inclusion 4: Xeric Torriorthents very cobbly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthent, loamy-skeletal, mixed (calcareous), mesic—1 percent  

Characteristics of the Burrita Soil  
Position on landscape: South- and west-facing side slopes of mountains  
Parent material: Kind—residuum; source—chert, quartzite, sandstone, shale  
Slope features: Length—long; shape—convex
**Dominant present vegetation:** Mountain big sagebrush, bluebunch wheatgrass, basin wildrye

**Rock fragments on the surface:** Kind—gravel, cobbles, stones; percentage of surface covered—50

**Typical profile**

0 to 8 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4

8 to 17 inches—very gravelly clay; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7

17 inches—unweathered bedrock

**Soil and water features**

**Depth to bedrock:** 14 to 20 inches

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Slow

**Available water capacity:** 1.4 to 1.8 inches

**Water-supplying capacity:** About 8 inches

**Runoff:** Very rapid

**Hydrologic group:** D

**Erosion factors (surface layer):** K value—.15; T value—1; wind erodibility group—8

**Hazard of erosion:** By water—severe; by wind—slight

**Shrink-swell potential:** Moderate

**Corrosivity:** To steel—high; to concrete—low

**Potential for frost action:** Low

**Characteristics of the Burnborough Soil**

**Position on landscape:** North- and east-facing side slopes of mountains

**Parent material:** Kind—residuum; source—andesite, rhyolite

**Slope features:** Length—long; shape—concave

**Dominant present vegetation:** Mountain big sagebrush, bluebunch wheatgrass, Thurber needlegrass

**Rock fragments on the surface:** Kind—gravel, cobbles; percentage of surface covered—55

**Typical profile**

0 to 13 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 40 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, SM-SC; estimated AASHTO classification—A-2

13 to 60 inches—very gravelly loam; 15 to 25 percent cobbles and stones and 40 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC-SC; estimated AASHTO classification—A-2

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Moderate

**Available water capacity:** 5.1 to 6.9 inches

**Water-supplying capacity:** About 10 inches

**Runoff:** Rapid

**Hydrologic group:** B

**Erosion factors (surface layer):** K value—.24; T value—5; wind erodibility group—7

**Hazard of erosion:** By water—severe; by wind—slight

**Shrink-swell potential:** Moderate

**Corrosivity:** To steel—moderate; to concrete—low

**Potential for frost action:** Moderate

**Contrasting Inclusions**

**Inclusion 1**

**Position on landscape:** Convex crests of mountains

**Distinctive present vegetation:** Thurber needlegrass, Wyoming big sagebrush

**Inclusion 2**

**Position on landscape:** Convex side slopes of mountains

**Distinctive present vegetation:** Bluebunch wheatgrass, Wyoming big sagebrush

**Inclusion 3**

**Position on landscape:** Crests and side slopes of mountains

**Distinctive present vegetation:** Barren

**Inclusion 4**

**Position on landscape:** Concave toe slopes adjacent to drainageways

**Distinctive present vegetation:** Basin wildrye, basin big sagebrush

**Major Uses**

**Current uses:** Wildlife habitat

**Wildlife habitat elements**

**Suitability of the Burrita soil for named elements:** Wild
herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Burnborough soil for named elements:
Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Burrita soil for selected uses and practices

Range seeding: Poor—droughty, large stones, erodes easily
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines, large stones
Gravel: Improbable source—excess fines, large stones
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embarkments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Burnborough soil for selected uses and practices

Range seeding: Poor—small stones, erodes easily
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, slope
Pond reservoir areas: Severe—slope
Embarkments, dikes, and levees: Moderate—large stones

Interpretive Groups

Capability classification: Burrita—VII, nonirrigated; Burnborough—VII, nonirrigated
Range site: Burrita—024X028N; Burnborough—024X021N

660—Oxcorel-Beoska-Whirlo association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 8 degrees F
Frost-free period: About 110 days

Composition

Major components:
• Oxcorel gravelly very fine sandy loam, 2 to 8 percent
slopes—Duric Natargids, fine, montmorillonitic, mesic—30 percent
• Beoska gravelly very fine sandy loam, 2 to 8 percent
slopes—Duric Natargids, fine-loamy, mixed, mesic—30 percent
• Whirlo gravelly very fine sandy loam, 2 to 8 percent
slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—25 percent

Contrasting inclusions:
• Inclusion 1: Xerollic Camborthids cobbly loam, 2 to 8 percent
slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—7 percent
• Inclusion 2: Typic Torrifuvents gravelly very fine
sandy loam, 0 to 4 percent slopes—Typic Torrifuvents,
fine-loamy, mixed (calcareous), mesic—5 percent
• Inclusion 3: Typic Torriorthents, 0 to 4 percent
slopes—Typic Torriorthents, loamy-skeletal, mixed
(calcareous), mesic—2 percent
• Inclusion 4: Xerollic Camborthids cobbly loam, 15 to
30 percent slopes—Xerollic Camborthids, loamy-
skeletal, mixed, mesic—1 percent

Characteristics of the Oxcorel Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium somewhat influenced by loess
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, cheatgrass
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—24

Typical profile

0 to 8 inches—gravelly very fine sandy loam; 0 to 10
percent cobbles and stones and 25 to 45 percent
pebbles (by weight); platy structure; slightly hard,
very friable; moderately alkaline (pH 8.3); nonsaline
(less than 4 mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—SM, GM;
estimated AASHTO classification—A-4

8 to 34 inches—clay loam; 0 to 5 percent cobbles and
stones and 10 to 20 percent pebbles (by weight);
prismatic structure; hard, firm; strongly alkaline (pH
8.6); nonsaline (less than 4 mmhos/cm); slightly
dodic (SAR 13 to 23); estimated Unified
classification—CL, CH; estimated AASHTO
classification—A-7

34 to 60 inches—very gravelly sandy loam; 0 to 15
percent cobbles and stones and 50 to 75 percent
pebbles (by weight); massive; hard, firm;
moderately alkaline (pH 8.2); nonsaline or slightly
saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to
23); estimated Unified classification—GM; estimated
AASHTO classification—A-1
Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 6.1 to 8.0 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Beoska Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, cheatgrass
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—32

Typical profile

0 to 13 inches—gravely very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4
13 to 25 inches—clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable, strongly alkaline (pH 8.7); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
25 to 44 inches—gravely sandy loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
44 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.0 to 8.3 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Whirlo Soil

Position on landscape: Inset fans
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—concave
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, cheatgrass
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—40

Typical profile

0 to 7 inches—gravely very fine sandy loam; 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, GM; estimated AASHTO classification—A-4
7 to 11 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
11 to 60 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); weak fine subangular structure; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 3.9 to 5.1 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—28; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Inset fans adjacent to drainageways
Distinctive present vegetation: Wyoming big sagebrush

Inclusion 2
Position on landscape: Drainageways
Distinctive present vegetation: Basin big sagebrush

Inclusion 3
Position on landscape: Slightly convex fan skirts adjacent to alluvial flats
Distinctive present vegetation: Black greasewood

Inclusion 4
Position on landscape: Side slopes of fan piedmont remnants adjacent to drainageways
Distinctive present vegetation: Bottlebrush, Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Oxcord soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Beoska soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Whirlo soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Oxcord soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Severe—seepage

Ratings and restrictive features of the Beoska soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Severe—seepage

Ratings and restrictive features of the Whirlo soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones, seepage
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty, slope
Terraces and diversions: Favorable

Interpretive Groups

Capability classification: Oxcord—IVc, irrigated, and Vlls, nonirrigated; Beoska—IIIe, irrigated, and Vlls, nonirrigated; Whirlo—IIIe, irrigated, and Vllc, nonirrigated
Range site: Oxcord—024X002N; Beoska—024X002N; Whirlo—024X002N

661—Oxcord-Orovada association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,500 to 5,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Oxcord gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natragids, fine, montmorillonitic, mesic—60 percent
- Orovada gravelly very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—25 percent

Contrasting inclusions:
- Inclusion 1: Snapp gravelly very fine sandy loam, 2 to 8 percent slopes—Durixerollic Natragids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—8 percent
- Inclusion 2: Dun Glen very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—7 percent

Characteristics of the Oxcord Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium somewhat influenced by loess
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—24

Typical profile

0 to 8 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsalic (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4
34 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsalic or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 6.1 to 8.0 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Orovada Soil

Position on landscape: Inset fans
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—15

Typical profile

0 to 6 inches—gravelly very fine sandy loam; 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsalic (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4
6 to 15 inches—loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsalic (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
15 to 60 inches or more—very fine sandy loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
Soil and water features

*Depth to a seasonal high water table:* More than 60 inches
*Flooded:* None
*Permeability:* Moderate
*Available water capacity:* 9.0 to 10.2 inches
*Water-supplying capacity:* About 8 inches
*Runoff:* Medium
*Hydrologic group:* B
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—4
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* Low
*Corrosivity:* To steel—high; to concrete—low
*Potential for frost action:* Moderate

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* The convex upper part of fan piedmont remnants adjacent to mountains
*Distinctive present vegetation:* Thurber needlegrass, Wyoming big sagebrush

**Inclusion 2**
*Position on landscape:* Convex inset fans
*Distinctive present vegetation:* Bottlebrush squirreltail, shadscale

**Major Uses**
*Current uses:* Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Oxcord soil for named elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Wildlife habitat elements**

*Suitability of the Orovada soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the Oxcord soil for selected uses and practices**

*Range seeding:* Poor—too arid, too crusty, excess sodium
*Daily cover for landfill:* Poor—small stones
*Shallow excavations:* Moderate—too clayey
*Local roads and streets:* Severe—low strength, shrink-swell
*Roadfill:* Good
*Sand:* Improbable source—excess fines

**Gravel:** Improbable source—excess fines
**Topsoil:** Poor—small stones, excess sodium, area reclaim
**Pond reservoir areas:** Severe—seepage
**Embankments, dikes, and levees:** Severe—seepage, excess sodium
**Drainage:** Deep to water
**Irrigation:** Percs slowly, slope, excess sodium
**Terraces and diversions:** Favorable

**Ratings and restrictive features of the Orovada soil for selected uses and practices**

*Range seeding:* Fair—too arid, too crusty
*Daily cover for landfill:* Good
*Shallow excavations:* Slight
*Local roads and streets:* Moderate—frost action
*Roadfill:* Good
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—small stones
*Pond reservoir areas:* Moderate—seepage, slope
*Embankments, dikes, and levees:* Severe—piping
*Drainage:* Deep to water
*Irrigation:* Erodable easily, excess salt
**Terraces and diversions:** Erodes easily

**Interpretive Groups**
*Capability classification:* Oxcord—IVe, irrigated, and VIs, nonirrigated; Orovada—Ile, irrigated, and Vlc, nonirrigated
*Range site:* Oxcord—024X002N; Orovada—024X020N

**662—Oxcord-Whirlo-Trocken Variant association**

**Map Unit Setting**
*Position on landscape:* Fan piedmonts
*Elevation:* 4,000 to 5,000 feet
*Average annual precipitation:* About 7 inches
*Average annual air temperature:* About 49 degrees F
*Frost-free period:* About 110 days

**Composition**

*Major components:*
  * Oxcord gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—40 percent
  * Whirlo very fine sandy loam, 2 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—30 percent
  * Trocken Variant very gravelly very fine sandy loam, 2 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—20 percent
Contrasting inclusions:
- Inclusion 1: Snapp very fine sandy loam, 2 to 8 percent slopes—Durixerolic Natargids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—5 percent
- Inclusion 2: Xerolic Camborthids loam, 2 to 8 percent slopes—Xerolic Camborthids, coarse-loamy, mixed, mesic—5 percent

Characteristics of the Oxcord Soil
Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium somewhat influenced by loess
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—24

Typical profile
0 to 8 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4
8 to 34 inches—clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
34 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 6.1 to 8.0 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High

Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Whirlo Soil
Position on landscape: Fan collars
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—40

Typical profile
0 to 11 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
11 to 30 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
30 to 60 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones and 65 to 80 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GW-GM, GP-GM; estimated AASHTO classification—A-1

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 3.9 to 5.1 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Trocken Variant Soil
Position on landscape: Inset fans
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Wyoming big sagebrush, spiny hop sage, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—55

Typical profile
0 to 5 inches—very gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline
(less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
5 to 60 inches—stratified extremely gravelly loam to very gravelly loamy sand; 5 to 15 percent cobbles and stones and 65 to 80 percent pebbles (by weight); massive; slightly hard, friable; strongly
alkaline (pH 9.0); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: Rare
Permeability: Moderately rapid
Available water capacity: 3.2 to 5.0 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.20; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex fan piedmont remnants adjacent to mountains
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Inclusion 2
Position on landscape: The smooth lower part of inset fans
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Oxcork soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Whirlo soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Trocken Variant soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Oxcork soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Good
Shallow excavations: Moderate—too clayey
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, excess sodium, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Drainage: Deep to water
Irrigation: Percs slowly, slope, excess sodium
Terraces and diversions: Favorable

Ratings and restrictive features of the Whirlo soil for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Poor—small stones, seepage
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty, slope
Terraces and diversions: Erodes easily
Ratings and restrictive features of the Trocken Variant soil for selected uses and practices

Range seeding: Poor—droughty, small stones
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding, frost action
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Slope, droughty, excess salt
Terraces and diversions: Too sandy

Interpretive Groups

Capability classification: Oxorel—IVe, irrigated, and VIIe, nonirrigated; Whirlo—IIIe, irrigated, and VIIe, nonirrigated; Trocken Variant—IVs, irrigated, and VIIe, nonirrigated
Range site: Oxorel—024X002N; Whirlo—024X002N; Trocken Variant—024X020N

663—Oxorel-Weso-Beoska association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Oxorel gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natragrids, fine, montmorillonitic, mesic—45 percent
- Weso very fine sandy loam, 2 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—25 percent
- Beoska very fine sandy loam, 2 to 8 percent slopes—Duric Natragrids, fine, montmorillonitic, mesic—15 percent
- Contrastings inclusions:
  - Inclusion 1: Xeric Torriorthents cobly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
  - Inclusion 2: Typic Camborthids silt loam, 2 to 8 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—4 percent
  - Inclusion 3: Snapp gravelly very fine sandy loam, 2 to 8 percent slopes—Durixerollic Natragrids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—3 percent
  - Inclusion 4: Xerollic Camborthids cobly loam, 15 to 30 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—3 percent

Characteristics of the Oxorel Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, cheatgrass
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—24

Typical profile
0 to 8 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4
8 to 34 inches—clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
34 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 6.1 to 8.0 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Weso Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bottlebrush squirreltail, bud sagebrush

Typical profile
0 to 7 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
7 to 12 inches—very fine sandy loam; 5 to 15 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
12 to 60 inches—very fine sandy loam; 5 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 8.0 to 10.4 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.49; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Beoska Soil
Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel; percentage of surface covered—2

Typical profile
0 to 13 inches—very fine sandy loam; 5 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
13 to 25 inches—clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
25 to 44 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
44 to 60 inches or more—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.0 to 8.3 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.49; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions
Inclusion 1
Position on landscape: Narrow drainageways on fan piedmonts
Distinctive present vegetation: Wyoming big sagebrush

Inclusion 2
Position on landscape: Convex fan skirts
Distinctive present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Inclusion 3
Position on landscape: Convex fan piedmont remnants
Distinctive present vegetation: Wyoming big sagebrush
Inclusion 4

Position on landscape: Side slopes of fan piedmont remnants adjacent to drainageways
Distinctive present vegetation: Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Oxcorél soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—poor

Suitability of the Weso soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the Beoska soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Oxcorél soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, excess sodium, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Drainage: Deep to water
Irrigation: Percs slowly, slope, excess sodium
Terraces and diversions: Favorable

Ratings and restrictive features of the Weso soil for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Fair—too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones, area reclaim, thin layer
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess salt, excess sodium
Drainage: Deep to water
Irrigation: Excess salt, slope
Terraces and diversions: Erodes easily, too sandy

Ratings and restrictive features of the Beoska soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess sodium, small stones, excess salt
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess salt, excess sodium
Drainage: Deep to water
Irrigation: Slope, soil blowing, erodes easily
Terraces and diversions: Erodes easily, soil blowing

Interpretive Groups

Capability classification: Oxcorél—IVe, irrigated, and VII, nonirrigated; Weso—Ill, irrigated, and VIIc, nonirrigated; Beoska—Ill, irrigated, and VIIa, nonirrigated
Range site: Oxcorél—024X002N; Weso—024X002N; Beoska—024X002N

664—Oxcorél-Golconda association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,500 to 5,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Oxcorél gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natargids, fine, montmorillonitic, mesic—50 percent
- Golconda silt loam, 2 to 8 percent slopes—Haplic Nadiurargids, fine-loamy, mixed, mesic—40 percent

Contrasting inclusions:
- Inclusion 1: Durothidic Xeric Torrithent silt loam, 2 to 8 percent slopes—Durothidic Xeric Torriothents, coarse-loamy, mixed (calcereous), mesic—5 percent
• Inclusion 2: Trocken Variant cobbly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

**Characteristics of the Oxcorrel Soil**

*Position on landscape:* Fan piedmont remnants
*Parent material:* Mixed alluvium somewhat influenced by loess
*Slope features:* Length—long; shape—slightly convex
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail
*Rock fragments on the surface:* Kind—gravel, cobbles; percentage of surface covered—24

**Typical profile**

0 to 8 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4

8 to 34 inches—clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

34 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches
*Flooded:* None
*Permeability:* Very slow
*Available water capacity:* 6.1 to 8.0 inches
*Water-supplying capacity:* About 7 inches
*Runoff:* Medium
*Hydrologic group:* D
*Erosion factors (surface layer):* K value—0.28; T value—5; wind erodibility group—4
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* High
*Corrosivity:* To steel—high; to concrete—high
*Potential for frost action:* Low

**Characteristics of the Golconda Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Loess and volcanic ash over mixed alluvium
*Slope features:* Length—long; shape—convex
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

**Typical profile**

0 to 10 inches—silt loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

10 to 23 inches—gravelly clay loam; 10 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

23 to 36 inches—strongly cemented duripan; massive; extremely hard, extremely firm

36 to 60 inches—very gravelly loamy coarse sand; 50 to 75 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GM, GP; estimated AASHTO classification—A-1

**Soil and water features**

*Depth to a hardpan:* 20 to 40 inches
*Depth to a seasonal high water table:* More than 60 inches
*Flooded:* None
*Permeability:* Above the duripan—slow
*Available water capacity:* 4.9 to 6.1 inches
*Water-supplying capacity:* About 6 inches
*Runoff:* Medium
*Hydrologic group:* C
*Erosion factors (surface layer):* K value—0.55; T value—2; wind erodibility group—5
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* Moderate
*Corrosivity:* To steel—high; to concrete—moderate
*Potential for frost action:* Low

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* Concave inset fans
*Distinctive present vegetation:* Black greasewood

**Inclusion 2**

*Position on landscape:* Narrow drainageways on fan piedmonts
*Distinctive present vegetation:* Wyoming big sagebrush
**Major Uses**

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Oxcorel soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Golconda soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Oxcorel soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, excess sodium, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Drainage: Deep to water
Irrigation: Percs slowly, slope, excess sodium
Terraces and diversions: Favorable

Ratings and restrictive features of the Golconda soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, too crusty
Daily cover for landfill: Poor—cemented pan, seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—low strength
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—area reclaim, excess salt, small stones
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium
Drainage: Deep to water
Irrigation: Percs slowly, cemented pan, slope
Terraces and diversions: Cemented pan, erodes easily

**Interpretive Groups**

Capability classification: Oxcorel—IVe, irrigated, and Vlls, nonirrigated; Golconda—IVe, irrigated, and Vlls, nonirrigated

Range site: Oxcorel—024X002N; Golconda—024X002N

**666—Oxcorel-Trocken Variant-Snapp association**

**Map Unit Setting**

Position on landscape: Fan piedmonts
Elevation: 4,000 to 5,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

**Composition**

Major components:
- Oxcorel gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—40 percent
- Trocken Variant very gravelly loam, 2 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—25 percent
- Snapp very fine sandy loam, 2 to 8 percent slopes—Durtexerol Natrargids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Adelaide silt loam, 2 to 8 percent slopes—Entic Duroiorthids, loamy, mixed, mesic, shallow—8 percent
- Inclusion 2: Weso very fine sandy loam, 2 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—7 percent

**Characteristics of the Oxcorel Soil**

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium somewhat influenced by loess
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirelltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—24

**Typical profile**

0 to 8 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4
8 to 34 inches—clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

34 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 6.1 to 8.0 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Moderate

Characteristics of the Snapp Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Wyoming big sagebrush, littleleaf horsebrush
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—55

Typical profile

0 to 9 inches—very fine sandy loam; 0 to 10 percent cobbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
9 to 28 inches—gravelly clay; 25 to 50 percent cobbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.6); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CH, GC; estimated AASHTO classification—A-7
28 to 39 inches—gravelly clay loam; 25 to 50 percent cobbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6, A-7
39 to 60 inches—very gravelly loamy sand; 50 to 85 percent cobbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1
Soil and water features

*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Slow
*Available water capacity:* 6.5 to 7.4 inches
*Water-supplying capacity:* About 9 inches
*Runoff:* Medium
*Hydrologic group:* C
*Erosion factors (surface layer):* K value—0.37; T value—3; wind erodibility group—3
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* High
*Corrosivity:* To steel—high; to concrete—high
*Potential for frost action:* Moderate

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* Concave inset fans
*Distinctive present vegetation:* Bottlebrush squirreltail, Wyoming big sagebrush

**Inclusion 2**
*Position on landscape:* Slightly convex fan skirts
*Distinctive present vegetation:* Bottlebrush squirreltail, shadscale, bud sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements**

**Suitability of the Oxcorel soil for named elements:** Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Suitability of the Trocken Variant soil for named elements:** Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Suitability of the Snapp soil for named elements:** Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings and restrictive features of the Oxcorel soil for selected uses and practices**

*Range seeding:* Poor—too arid, too crusty, excess sodium
*Daily cover for landfill:* Poor—small stones
*Shallow excavations:* Moderate—too clayey
*Local roads and streets:* Severe—low strength, shrink-swell

**Roadfill:** Good
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—small stones, excess sodium, area reclaim
*Pond reservoir areas:* Severe—seepage
*Embankments, dikes, and levees:* Severe—seepage, excess sodium
*Drainage:* Deep to water
*Irrigation:* Percs slowly, slope, excess sodium
*Terraces and diversions:* Favorable

**Ratings and restrictive features of the Trocken Variant soil for selected uses and practices**

*Range seeding:* Poor—small stones, excess salt, excess sodium
*Daily cover for landfill:* Poor—small stones
*Shallow excavations:* Severe—cutbanks cave
*Local roads and streets:* Moderate—frost action
*Roadfill:* Good
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—small stones, area reclaim, excess salt
*Pond reservoir areas:* Severe—seepage
*Embankments, dikes, and levees:* Severe—seepage
*Drainage:* Deep to water
*Irrigation:* Slope, droughty, excess salt
*Terraces and diversions:* Too sandy

**Ratings and restrictive features of the Snapp soil for selected uses and practices**

*Range seeding:* Poor—excess salt, excess sodium, too crusty
*Daily cover for landfill:* Poor—seepage, small stones
*Shallow excavations:* Severe—cutbanks cave
*Local roads and streets:* Moderate—frost action
*Roadfill:* Good
*Sand:* Probable source
*Gravel:* Probable source
*Topsoil:* Poor—small stones, area reclaim, too clayey
*Pond reservoir areas:* Moderate—seepage, slope
*Embankments, dikes, and levees:* Severe—seepage, excess sodium
*Drainage:* Deep to water
*Irrigation:* Droughty, slope, soil blowing
*Terraces and diversions:* Erodes easily, too sandy

**Interpretive Groups**

**Capability classification:** Oxcorel—IVe, irrigated, and VIII, nonirrigated; Trocken Variant—IVs, irrigated, and VII, nonirrigated; Snapp—IIE, irrigated, and VII, nonirrigated

**Range site:** Oxcorel—024X002N; Trocken Variant—024X020N; Snapp—024X005N
669—Oxcorel-Beoska association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Oxcorel gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natargids, fine, montmorillonitic, mesic—45 percent
- Beoska gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natargids, fine-loamy, mixed, mesic—40 percent

Contrasting inclusions:
- Inclusion 1: Trocken Variant cobbly loam, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—8 percent
- Inclusion 2: Snapp gravelly very fine sandy loam, 2 to 8 percent slopes—Durixerolic Natargids, clayey over sandy-skeletal, montmorillonitic, mesic—5 percent
- Inclusion 3: Xerollic Camborthids cobbly loam, 15 to 30 percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—2 percent

Characteristics of the Oxcorel Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium somewhat influenced by loess
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—24

Typical profile

0 to 8 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4
8 to 34 inches—clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
34 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 6.1 to 8.0 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Beoska Soil

Position on landscape: Fan piedmont remnants
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—32

Typical profile

0 to 13 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4
13 to 25 inches—clay loam; 10 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
25 to 44 inches—stratified gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
44 to 60 inches—stratified extremely gravelly very fine sandy loam to very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.0 to 8.3 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Narrow drainageways on fan piedmonts
Distinctive present vegetation: Wyoming big sagebrush

Inclusion 2
Position on landscape: Slightly convex fan piedmont remnants adjacent to foothills
Distinctive present vegetation: Wyoming big sagebrush

Inclusion 3
Position on landscape: Convex side slopes of fan piedmont remnants adjacent to drainageways
Distinctive present vegetation: Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Oxcord soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Beoska soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Oxcord soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, excess sodium, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Drainage: Deep to water
Irrigation: Percs slowly, slope, excess sodium
Terraces and diversions: Favorable

Ratings and restrictive features of the Beoska soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, excess salt
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess sodium, excess salt
Drainage: Deep to water
Irrigation: Slope, excess sodium, excess salt
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: Oxcord—IVe, irrigated, and Vlls, nonirrigated; Beoska—Ille, irrigated, and Vlls, nonirrigated
Range site: Oxcord—024X002N; Beoska—024X002N

670—Misad-Snapp-Oxcord association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,000 to 5,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days
Composition

Major components:
- Misad gravelly very fine sandy loam, 0 to 2 percent slopes—Durorthic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—35 percent.
- Snapp gravelly very fine sandy loam, 2 to 8 percent slopes—Durixerollic Natrarargids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—35 percent.
- Oxcorn gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natrarargids, fine, montmorillonitic, mesic—20 percent.

Contrasting inclusions:
- Inclusion 1: Trocken Variant cobbly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—9 percent.
- Inclusion 2: Xerolic Haplalgids cobbly loam, 15 to 30 percent slopes—Xerolic Haplalgids, loamy-skeletal, mixed, mesic—1 percent.

Characteristics of the Misad Soil

Position on landscape: Fan skirts
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Typical profile

0 to 11 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM, GM-GC; estimated AASHTO classification—A-1, A-2

11 to 28 inches—stratified fine sandy loam to very gravelly sandy loam; 5 to 10 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2

28 to 60 inches—stratified very gravelly loamy sand to extremely gravelly coarse sand; 5 to 10 percent cobbles and stones and 60 to 80 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 3.1 to 4.5 inches
Water-supplying capacity: About 7 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Snapp Soil

Position on landscape: Fan pediment remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, Sandberg bluegrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—53

Typical profile

0 to 9 inches—gravelly very fine sandy loam; 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2

9 to 28 inches—gravelly clay; 25 to 50 percent pebbles (by weight); prismatic structure; hard, firm; very strongly alkaline (pH 9.6); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CH, GC; estimated AASHTO classification—A-7

28 to 39 inches—gravelly clay loam; 25 to 50 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6, A-7

39 to 60 inches—very gravelly loamy sand; 50 to 85 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 6.5 to 7.4 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (surface layer): K value—.15; T value—3; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Moderate

**Characteristics of the Oxcorel Soil**

**Position on landscape:** Fan piedmont remnants
**Parent material:** Mixed alluvium somewhat influenced by loess
**Slope features:** Length—long; shape—slightly convex
**Dominant present vegetation:** Shadscale, bud sagebrush, bottlebrush squirreltail
**Rock fragments on the surface:** Kind—gravel, cobbles; percentage of surface covered—24

**Typical profile**

0 to 8 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4

8 to 34 inches—clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

34 to 60 inches or more—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

**Depth to a seasonal high water table:** More than 60 inches
**Flooding:** None
**Permeability:** Very slow
**Available water capacity:** 6.1 to 8.0 inches
**Water-supplying capacity:** About 6 inches
**Runoff:** Medium
**Hydrologic group:** D
**Erosion factors (surface layer):** K value—.28; T value—5; wind erodibility group—4

**Hazard of erosion:** By water—slight; by wind—slight
**Shrink-swell potential:** High
**Corrosivity:** To steel—high; to concrete—high
**Potential for frost action:** Low

**Contrasting Inclusions**

**Inclusion 1**
**Position on landscape:** Narrow drainageways on fan piedmonts
**Distinctive present vegetation:** Bottlebrush squirreltail, Wyoming big sagebrush

**Inclusion 2**
**Position on landscape:** Side slopes of fan piedmont remnants adjacent to drainageways
**Distinctive present vegetation:** Bottlebrush squirreltail, Wyoming big sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements**

**Suitability of the Misad soil for named elements:** Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Suitability of the Snapp soil for named elements:** Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Suitability of the Oxcorel soil for named elements:** Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings and restrictive features of the Misad soil for selected uses and practices**

**Range seeding:** Poor—too arid, excess salt, too crusty
**Daily cover for landfill:** Poor—seepage, too sandy, small stones
**Shallow excavations:** Severe—cutbanks cave
**Local roads and streets:** Slight
**Roadfill:** Good
**Sand:** Probable source
**Gravel:** Probable source
**Topsoil:** Poor—small stones, area reclaim
**Pond reservoir areas:** Severe—seepage
**Embankments, dikes, and levees:** Severe—seepage
**Drainage:** Deep to water
**Irrigation:** Droughty, soil blowing
**Terraces and diversions:** Too sandy, soil blowing
Ratings and restrictive features of the Snapp soil for selected uses and practices

Range seeding: Fair—excess salt, excess sodium, too crusty.
Daily cover for landfill: Poor—seepage, small stones.
Shallow excavations: Severe—cutbanks cave.
Local roads and streets: Moderate—frost action.
Roadfill: Good.
Sand: Probable source.
Gravel: Probable source.
Topsoil: Poor—small stones, area reclaim, too clayey.
Pond reservoir areas: Moderate—seepage, slope.
Embankments, dikes, and levees: Severe—seepage, excess sodium.
Drainage: Deep to water.
Irrigation: Droughty, percs slowly, slope.
Terraces and diversions: Too sandy, soil blowing.

Ratings and restrictive features of the Oxcordel soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium.
Daily cover for landfill: Poor—small stones.
Shallow excavations: Moderate—too clayey.
Local roads and streets: Severe—low strength, shrink-swell.
Roadfill: Good.
Sand: Improbable source—excess fines.
Gravel: Improbable source—excess fines.
Topsoil: Poor—small stones, excess sodium, area reclaim.
Pond reservoir areas: Severe—seepage.
Embankments, dikes, and levees: Severe—seepage, excess sodium.
Drainage: Deep to water.
Irrigation: Percs slowly, slope, excess sodium.
Terraces and diversions: Favorable.

Interpretive Groups

Capability classification: Misad—IIs, irrigated, and VIIIs, nonirrigated; Snapp—Ille, irrigated, and VIIIs, nonirrigated; Oxcordel—IVe, irrigated, and VIIIs, nonirrigated.
Range site: Misad—024X002N; Snapp—024X005N; Oxcordel—024X002N.

673—Misad-Golconda-Tenabo association

Map Unit Setting

Position on landscape: Fan piedmonts.
Elevation: 4,500 to 5,500 feet.
Average annual precipitation: About 7 inches.
Average annual air temperature: About 48 degrees F.

Frost-free period: About 110 days.

Composition

Major components:
- Misad gravelly very fine sandy loam, 2 to 8 percent slopes—Durothic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—35 percent.
- Golconda very fine sandy loam, 2 to 8 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—30 percent.
- Tenabo gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—25 percent.

Contrasting inclusions:
- Inclusion 1: Trocken Variant extremely stony sandy loam, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—8 percent.
- Inclusion 2: Typic Nadurargids extremely stony loam, 2 to 8 percent slopes—Typic Nadurargids, fine, montmorillonitic, mesic—2 percent.

Characteristics of the Misad Soil

Position on landscape: Fan skirts.
Parent material: Loess over mixed alluvium.
Slope features: Length—long; shape—convex.
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail.

Typical profile:

0 to 11 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-2, A-4.

11 to 28 inches—stratified fine sandy loam to very gravelly sandy loam; 5 to 10 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2.

28 to 60 inches—stratified very gravelly loamy sand to extremely gravelly coarse sand; 5 to 10 percent cobbles and stones and 60 to 80 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1.
Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 3.1 to 4.5 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value=.24; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Characteristics of the Golconda Soil

Position on landscape: Fan piedmont remnants
Parent material: Loess overl mixed alluvium high in content of volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Typical profile

0 to 10 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
10 to 23 inches—gravelly clay loam; 25 to 45 percent pebbles (by weight); prismatic structure; very hard, very firm; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7
36 to 60 inches—very gravelly loamy coarse sand; 50 to 75 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GM, GP; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—slow
Available water capacity: 4.9 to 6.1 inches

Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (surface layer): K value=.55; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Characteristics of the Tenabo Soil

Position on landscape: Fan piedmont remnants
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

Typical profile

0 to 5 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 40 to 50 percent pebbles (by weight); soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4
5 to 17 inches—clay loam; 10 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-6
17 to 24 inches—indurated duripan; massive; extremely hard, extremely firm
24 to 60 inches—stratified very gravelly sandy loam to extremely gravelly coarse sand; 5 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 15 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—moderately slow
Available water capacity: 3.2 to 3.5 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

**Contrasting Inclusions**

**Inclusion 1**
Position on landscape: Narrow drainageways on fan piedmont remnants
Distinctive present vegetation: Wyoming big sagebrush

**Inclusion 2**
Position on landscape: Convex fan piedmont remnants
Distinctive present vegetation: Shadscale

**Major Uses**

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Misad soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Golconda soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Tenabo soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Misad soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, too crusty
Daily cover for landfill: Poor—seepage, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium
Drainage: Deep to water
Irrigation: Droughty, soil blowing, slope
Terraces and diversions: Too sandy, soil blowing

Ratings and restrictive features of the Golconda soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, too crusty

Ratings and restrictive features of the Tenabo soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, too crusty

**Interpretive Groups**

Capability classification: Misad—Ille, irrigated, and Vlls, nonirrigated; Golconda—Ive, irrigated, and Vlls, nonirrigated; Tenabo—IVe, irrigated, and Vlls, nonirrigated
Range site: Misad—024X002N; Golconda—024X002N; Tenabo—024X002N

675—Misad-Orovada-Snapp association

**Map Unit Setting**

Position on landscape: Fan piedmonts
Elevation: 4,000 to 5,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days
Composition

**Major components:**
- Misad gravelly very fine sandy loam, 2 to 8 percent slopes—Durothic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—40 percent
- Orovida very fine sandy loam, 2 to 8 percent slopes—Durixerolic Camborthods, coarse-loamy, mixed, mesic—25 percent
- Snap gravelly very fine sandy loam, 2 to 8 percent slopes—Durixerolic Natrargids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—20 percent
- Contraction inclusions:
  - Inclusion 1: Xerolic Camborthods loam, 0 to 2 percent slopes—Xerolic Camborthods, loamy-skeletal, mixed, mesic—7 percent
  - Inclusion 2: Golconda very fine sandy loam, 2 to 8 percent slopes—Haplic Nadurargids, fine-loamy, mixed, mesic—6 percent
  - Inclusion 3: Batan silt loam, 0 to 2 percent slopes—Durothic Torriorthents, fine-silty, mixed (calcareous), mesic—1 percent
  - Inclusion 4: Valmy fine sandy loam, 0 to 2 percent slopes—Durothic Torriorthents, coarse-loamy, mixed (calcareous), mesic—1 percent

Characteristics of the Misad Soil

**Position on landscape:** Fan skirts, fan aprons
**Parent material:** Loess over mixed alluvium
**Slope features:** Length—long; shape—slightly convex
**Dominant present vegetation:** Shadscale, bud sagebrush, bottlebrush squirreltail

**Typical profile**

0 to 11 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; slightly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-2, A-4

11 to 28 inches—stratified fine sandy loam to very gravelly sandy loam; 5 to 10 percent cobbles and stones and 40 to 60 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

28 to 60 inches—stratified very gravelly loamy sand to extremely gravelly coarse sand; 5 to 10 percent cobbles and stones and 60 to 80 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

Soil and water features

**Depth to a seasonal high water table:** More than 60 inches
**Flooding:** None
**Permeability:** Moderately rapid
**Available water capacity:** 3.1 to 4.5 inches
**Water-supplying capacity:** About 6 inches
**Runoff:** Medium
**Hydrologic group:** B

**Erosion factors (surface layer):** K value—24; T value—5; wind erodibility group—4
**Hazard of erosion:** By water—slight; by wind—slight
**Shrink-swell potential:** Low
**Corrosivity:** To steel—high; to concrete—low
**Potential for frost action:** Low

Characteristics of the Orovida Soil

**Position on landscape:** Fan skirts, fan aprons
**Parent material:** Mixed alluvium influenced by loess and volcanic ash
**Slope features:** Length—long; shape—slightly concave
**Dominant present vegetation:** Wyoming big sagebrush, spiny hop sage, Sandberg bluegrass

**Typical profile**

0 to 11 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

11 to 24 inches—loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

24 to 60 inches—stratified fine sandy loam to silt loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

Soil and water features

**Depth to a seasonal high water table:** More than 60 inches
**Flooding:** None
**Permeability:** Moderate
**Available water capacity:** 9.0 to 10.2 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.49; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Snapp Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, Sandberg bluegrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—53

Typical profile

0 to 9 inches—gravelly very fine sandy loam; 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2
9 to 28 inches—gravelly clay; 25 to 50 percent pebbles (by weight); prismatic structure; hard, firm; very strongly alkaline (pH 9.6); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CH, GC; estimated AASHTO classification—A-7
28 to 39 inches—gravelly clay loam; 25 to 50 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 23 to 46); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6, A-7
39 to 60 inches—very gravelly loamy sand; 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 5.6 to 7.4 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: C

Erosion factors (surface layer): K value—.15; T value—3; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Narrow drainageways on fan skirts
Distinctive present vegetation: Wyoming big sagebrush

Inclusion 2
Position on landscape: Convex fan piedmont remnants
Distinctive present vegetation: Shadscale, bud sagebrush

Inclusion 3
Position on landscape: Convex fan skirts
Distinctive present vegetation: Black greasewood

Inclusion 4
Position on landscape: Slightly convex fan skirts adjacent to alluvial flats
Distinctive present vegetation: Black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Misad soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Orovida soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Snapp soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Misad soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess salt
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty, soil blowing, slope
Terraces and diversions: Too sandy, soil blowing

Ratings and restrictive features of the Orovada soil for selected uses and practices
Range seeding: Fair—too arid, too crusty
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones, thin layer
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Slope, erodes easily, soil blowing
Terraces and diversions: Erodes easily, soil blowing

Ratings and restrictive features of the Snapp soil for selected uses and practices
Range seeding: Fair—excess salt, excess sodium, too crusty
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, too clayey
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—seepage, excess sodium
Drainage: Deep to water
Irrigation: Droughty, percs slowly, slope
Terraces and diversions: Too sandy

Interpretive Groups
Capability classification: Misad—Ille, irrigated, and Vls, nonirrigated; Orovada—Ille, irrigated, and Vle, nonirrigated; Snapp—Ille, irrigated, and Vls, nonirrigated
Range site: Misad—024X002N; Orovada—024X020N; Snapp—024X005N

676—Misad Variant-Dun Glen-Misad Variant, strongly sloping, association

Map Unit Setting
Position on landscape: Fan skirts, beach plains
Elevation: 4,000 to 4,500 feet

Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition
Major components:
- Misad Variant gravelly very fine sandy loam, 2 to 8 percent slopes—Durorthid Torriorthents, loamy-skeletal, mixed (calcareous), mesic—35 percent
- Dun Glen silt loam, frequently flooded, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—30 percent
- Misad Variant gravelly very fine sandy loam, 8 to 15 percent slopes—Durorthid Torriorthents, loamy-skeletal, mixed (calcareous), mesic—20 percent
- Contrasting inclusions:
  - Inclusion 1: Weso very fine sandy loam, 2 to 8 percent slopes—Doric Camborthids, coarse-loamy, mixed, mesic—10 percent
  - Inclusion 2: Trocken Variant cobbly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

Characteristics of the Less Sloping Misad Variant Soil
Position on landscape: Nondissected parts of beach terraces
Parent material: Loess over mixed alluvium high in content of volcanic ash
Slope features: Length—long; shape—plane to convex
Dominant present vegetation: Shadscale, winterfat, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel; percentage of surface covered—15

Typical profile
0 to 3 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
3 to 23 inches—very fine sandy loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; very strongly alkaline (pH 9.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
23 to 60 inches—extremely gravelly coarse sandy loam; 5 to 10 percent cobbles and stones and 75 to 85 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46);
Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 4.4 to 5.7 inches
Water-supplying capacity: About 7 inches
Runoff: Medium

Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—3; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Dun Glen Soil

Position on landscape: Fans skirts
Parent material: Loess high in content of volcanic ash over mixed alluvium
Slope features: Length—long; shape—plane
Dominant present vegetation: Winterfat, bud sagebrush, bottlebrush squirreltail

Typical profile

0 to 3 inches—silt loam; platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
3 to 10 inches—silt loam; 0 to 10 percent pebbles (by weight); angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
10 to 60 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); massive; soft, friable; very strongly alkaline (pH 9.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: Frequency—frequent; duration—very brief; months—January through May
Permeability: Moderate
Available water capacity: 6.8 to 8.0 inches
Water-supplying capacity: About 7 inches
Runoff: Very slow

Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—3; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Strongly Sloping Misad Variant Soil

Position on landscape: Dissected parts of beach terraces
Parent material: Loess over mixed alluvium
Slope features: Length—short; shape—plane to convex
Dominant present vegetation: Shadscale, winterfat, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel; percentage of surface covered—15

Typical profile

0 to 3 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
3 to 23 inches—very fine sandy loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
23 to 60 inches—extremely gravelly coarse sandy loam; 5 to 10 percent cobbles and stones and 75 to 85 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 4.4 to 5.7 inches
Water-supplying capacity: About 7 inches
Runoff: Medium

Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—3; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex fan aprons
Distinctive present vegetation: Shadscale, bud sagebrush

Inclusion 2
Position on landscape: Narrow drainageways on fan piedmonts
Distinctive present vegetation: Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the less sloping Misad Variant soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Dun Glen soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the strongly sloping Misad Variant soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the less sloping Misad Variant soil for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—small stones
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty, slope, excess salt
Terraces and diversions: Excess salt

Ratings and restrictive features of the Dun Glen soil for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Good
Shallow excavations: Moderate—floodling

Local roads and streets: Severe—floodling
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—small stones
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Erodes easily, flooding
Terraces and diversions: Erodes easily

Ratings and restrictive features of the strongly sloping Misad Variant soil for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Moderate—slope
Local roads and streets: Moderate—slope
Roadfill: Good
Sand: Improbable source—small stones
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty, slope, excess salt
Terraces and diversions: Slope, erodes easily

Interpretive Groups

Capability classification: The less sloping Misad Variant—Ill, irrigated, and VIl, nonirrigated; Dun Glen—Illw, irrigated, and Vllw, nonirrigated; Misad Variant, strongly sloping—IVe, irrigated, and VIlw, nonirrigated

Range site: The less sloping Misad Variant—024X014N; Dun Glen—024X004N; Misad Variant, strongly sloping—024X014N

680—Bojo-Trunk-Rock outcrop association

Map Unit Setting

Position on landscape: Mountains
Elevation: 4,500 to 5,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Bojo very gravelly loam, 30 to 50 percent slopes—
- Lithic Hapludalfs, loamy, mixed, mesic—35 percent
- Trunk very cobbly loam, 30 to 50 percent slopes—
Xerollic Haplargids, fine, montmorillonitic, mesic—30 percent
• Rock outcrop—20 percent

Contrasting inclusions:
• Inclusion 1: Burrita very cobbly loam, 4 to 15 percent
  slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic—7 percent
• Inclusion 2: Xeric Torriorthents very cobbly loam, 50 to
  75 percent slopes—Xeric Torriorthents, loamy, mixed
  (calcareous), mesic, shallow—4 percent
• Inclusion 3: Typic Haplargids cobbly loam, 30 to 50
  percent slopes—Typic Haplargids, fine-loamy, mixed, mesic—2 percent
• Inclusion 4: Xerollic Camborthids cobbly loam, 8 to 15
  percent slopes—Xerollic Camborthids, loamy-skeletal, mixed, mesic—2 percent

Characteristics of the Bojo Soil

Position on landscape: Side slopes on mountains
Parent material: Kind—residuum; source—metamorphic
  or extrusive igneous rocks
Slope features: Length—long; shape—concave
Dominant present vegetation: Wyoming big sagebrush, sandberg bluegrass, rabbitbrush
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—45

Typical profile

0 to 3 inches—very gravelly loam; 10 to 25 percent
  cobbles and stones and 45 to 65 percent pebbles
  (by weight); platy structure; soft, very friable;
  moderately alkaline (pH 8.4); nonsaline (less than 4
  mmhos/cm); nonsodic (SAR less than 13);
  estimated Unified classification—GM-GC; estimated
  AASHTO classification—A-2
3 to 10 inches—gravelly clay loam; 0 to 10 percent cobbles
  and stones and 25 to 35 percent pebbles (by weight);
  subangular blocky structure; hard, firm;
  moderately alkaline (pH 8.4); nonsaline (less than 4
  mmhos/cm); nonsodic (SAR less than 13);
  estimated Unified classification—GC, CL; estimated
  AASHTO classification—A-6, A-7
10 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 22 to 38 inches
Depth to a seasonal high water table: More than 60
  inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.9 to 3.8 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—
  2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—silt
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Rock Outcrop

Position on landscape: Scattered small peaks and
  ridges
Dominant present vegetation: Barren

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* Convex crests of mountains  
*Distinctive present vegetation:* Thurberry needlegrass, Wyoming big sagebrush

**Inclusion 2**
*Position on landscape:* Convex side slopes of mountains  
*Distinctive present vegetation:* Wyoming big sagebrush, shadscale

**Inclusion 3**
*Position on landscape:* Convex side slopes of foothills  
*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 4**
*Position on landscape:* Convex side slopes of foothills  
*Distinctive present vegetation:* Thurberry needlegrass, Wyoming big sagebrush

**Major Uses**

*Current uses:* Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Bojo soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Trunk soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings and restrictive features of the Bojo soil for selected uses and practices**

*Range seeding:* Poor—droughty, small stones, too arid  
*Daily cover for landfill:* Poor—slope, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, slope  
*Pond reservoir areas:* Severe—slope  
*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Bojo—VII, nonirrigated; Trunk—VII, nonirrigated  
*Range site:* Bojo—024X026N; Trunk—024X005N

**683—Bojo, steep-Hoot-Bojo association**

**Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 4,500 to 5,500 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free period:* About 110 days

**Composition**

*Major components:*  
- Bojo very cobbly loam, 30 to 50 percent slopes—Lithic Haplughids, loamy, mixed, mesic—40 percent  
- Hoot very cobbly loam, 30 to 50 percent slopes—Lithic Haplughids, loamy-skeletal, mixed, mesic—35 percent  
- Bojo very cobbly loam, 4 to 15 percent slopes—Lithic Haplughids, loamy, mixed, mesic—15 percent

*Contrasting inclusions:*  
- Inclusion 1: Rock outcrop—5 percent  
- Inclusion 2: Xeric Torriorthents cobbly loam, rarely flooded, 2 to 8 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

**Characteristics of the Steep Bojo Soil**

*Position on landscape:* North- and east-facing side slopes of mountains  
*Parent material:* Kind—residuum; source—volcanic rocks  
*Slope features:* Length—long; shape—convex  
*Distinctive present vegetation:* Wyoming big sagebrush, shadscale, bud sagebrush, spiny hopsage, bottlebrush squirreltail  
*Rock fragments on the surface:* Kind—cobbles, gravel, stones; percentage of surface covered—45

**Typical profile**

0 to 3 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
3 to 10 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6
10 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 0.8 inch to 1.2 inches
Water-supplying capacity: About 6 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Strongly Sloping Bojo Soil

Position on landscape: Crests of mountains
Parent material: Kind—residuum; source—volcanic rocks
Slope features: Length—short; shape—convex
Dominant present vegetation: Wyoming big sagebrush, shadscale, bud sagebrush, spiny hopsage, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—45

Typical profile

0 to 3 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
3 to 10 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6
10 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 5 to 14 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.3 to 1.7 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—
1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Side slopes of mountains
Distinctive present vegetation: Barren

Inclusion 2
Position on landscape: Narrow drainageways on mountainsides
Distinctive present vegetation: Basin big sagebrush, basin wildrye

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the steep Bojo soil for named elements:
Wild herbaceous plants (nonirrigated)—poor; shrubs
(nonirrigated)—poor
Suitability of the Hoot soil for named elements:
Wild herbaceous plants (nonirrigated)—poor; shrubs
(nonirrigated)—poor
Suitability of the strongly sloping Bojo soil for named elements:
Wild herbaceous plants (nonirrigated)—poor; shrubs
(nonirrigated)—poor

Ratings and restrictive features of the steep Bojo soil for selected uses and practices

Range seeding: Poor—droughty, small stones, too arid
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, slope, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embarkments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the strongly sloping Bojo soil for selected uses and practices

Range seeding: Poor—droughty, small stones, too arid
Daily cover for landfill: Poor—depth to bedrock
Shallow excavations: Severe—depth to bedrock
Local roads and streets: Severe—depth to bedrock
Roadfill: Poor—depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock
Embarkments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Bojo, steep—VII, nonirrigated;
Hoot—VII, nonirrigated; Bojo, strongly sloping—
VII, nonirrigated
Range site: Bojo, steep—024X026N; Hoot—024X002N;
Bojo, strongly sloping—024X026N

691—Chilper-Trocken-Jerval association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 51 degrees F
Frost-free period: About 110 days

Composition

Major components:
• Chilper cobbly very fine sandy loam, 2 to 8 percent
  slopes—Duric Natragids, fine, montmorillonitic, mesic—
  35 percent
• Trocken gravelly very fine sandy loam, 2 to 8 percent
  slopes—Typic Torriorthents, loamy-skeletal, mixed
  (calcareous), mesic—30 percent
• Jerval cobbly very fine sandy loam, 2 to 8 percent
  slopes—Duric Natragids, fine-loamy, mixed, mesic—25
  percent

Contrasting inclusions:
• Inclusion 1: Bluewing cobbly loam, 0 to 4 percent
  slopes—Typic Torriorthents, sandy-skeletal, mixed,
  mesic—5 percent
• Inclusion 2: Mazuma silt loam, strongly saline-alkali, 0
  to 2 percent slopes—Typic Torriorthents, coarse-loamy,
  mixed (calcareous), mesic—5 percent
**Characteristics of the Chilper Soil**

*Position on landscape:* Fan piedmont remnants  
*Parent material:* Loess over mixed alluvium and volcanic ash  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Shadscale, bluegrass, bud sagebrush  
*Rocks on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—17

**Typical profile**

0 to 3 inches—cobbly very fine sandy loam; 10 to 25 percent cobbles and stones and 15 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, GM, SM; estimated AASHTO classification—A-4

3 to 13 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 29 inches—clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

29 to 60 inches or more—extremely gravelly sandy loam; 0 to 10 percent cobbles and stones and 75 to 90 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 3.0 to 4.8 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—32; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential for frost action:* Low

**Characteristics of the Trocken Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Shadscale, bud sagebrush  
*Rocks on the surface:* Kind—gravel, cobbles; percentage of surface covered—30

**Typical profile**

0 to 3 inches—gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4

3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobbly loam; 5 to 40 percent cobbles and stones and 60 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 3.0 to 4.8 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—32; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential for frost action:* Low

**Characteristics of the Jerval Soil**

*Position on landscape:* Fan piedmont remnants  
*Parent material:* Loess over mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, Bailey greasewood  
*Rocks on the surface:* Kind—gravel, cobbles; percentage of surface covered—25

**Typical profile**

0 to 6 inches—cobbly very fine sandy loam; 25 to 40
percent cobbles and stones and 10 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

6 to 22 inches—gravelly clay loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); prismatic structure; hard, friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-6

22 to 60 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.4); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 5.5 to 6.3 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.17; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Narrow drainageways on fan piedmonts
Distinctive present vegetation: Shadscale, bluegrass

Inclusion 2
Position on landscape: The slightly concave lower part of fan skirts
Distinctive present vegetation: Black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Chiper soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Trocken soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Jerval soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Chiper soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Good
Sand: Improbable source—small stones
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, too clayey
Pond reservoir areas: Moderate—slope
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium
Drainage: Deep to water
Irrigation: Slope, percs slowly, erodes easily
Terraces and diversions: Erodes easily

Ratings and restrictive features of the Trocken soil for selected uses and practices

Range seeding: Poor—too arid, small stones, too crusty
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—large stones
Roadfill: Fair—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—area reclaim, small stones
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Jerval soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, excess sodium
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium
Drainage: Deep to water
Irrigation: Slope, excess sodium
Terraces and diversions: Favorable

**Interpretive Groups**
Capability classification: Chilper—IVs, irrigated, and VIIIs, nonirrigated; Trocken—VIIIs, nonirrigated; Jerval—Ili, irrigated, and VIIIs, nonirrigated
Range site: Chilper—027X028; Trocken—027X028; Jerval—027X028

**701—Atlow-Wiskan association**

**Map Unit Setting**
Position on landscape: Side slopes on mountains
Elevation: 5,000 to 6,500 feet
Average annual precipitation: About 10 inches
Average annual air temperature: About 45 degrees F
Frost-free period: About 100 days

**Composition**
Major components:
- Atlow very gravelly loam, 30 to 50 percent slopes—Lithic Xerolic Haplargids, loamy-skeletal, mixed, mesic—45 percent
- Wiskan very gravelly loam, 30 to 50 percent slopes—Xerolic Haplargids, loamy-skeletal, mixed, frigid—40 percent
Contrasting inclusions:
- Inclusion 1: Lithic Torriorthents very cobbly loam, 50 to 75 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 2: Linrose very gravelly loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 3: Xerolic Haplargids loam, 30 to 50 percent slopes—Xerolic Haplargids, fine-loamy, mixed, mesic—3 percent
- Inclusion 4: Xeric Torriorthents cobbly loam, rarely flooded, 4 to 15 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—2 percent

**Characteristics of the Atlow Soil**
Position on landscape: South- and west-facing side slopes of mountains
Parent material: Kind—residuum; source—chert, argillite, shale, altered rhyolitic tuff, andesite
Slope features: Length—long; shape—convex

**Dominant present vegetation:** Black sagebrush, Sandberg bluegrass, bottlebrush squirreltail, scattered Utah juniper

**Rock fragments on the surface:** Kind—gravel, cobbles, stones; percentage of surface covered—62

**Typical profile**
0 to 6 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6
6 to 15 inches—very gravelly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7
15 inches—unweathered bedrock

**Soil and water features**
Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.1 to 1.4 inches
Water-supplying capacity: 4 to 6 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

**Characteristics of the Wiskan Soil**
Position on landscape: North- and east-facing side slopes of mountains
Parent material: Kind—residuum; source—chert, argillite, siliceous volcanic rocks
Slope features: Length—long; shape—convex

**Dominant present vegetation:** Black sagebrush, bluebunch wheatgrass, bottlebrush squirreltail, scattered Utah Juniper

**Rock fragments on the surface:** Kind—gravel, cobbles, stones; percentage of surface covered—52

**Typical profile**
0 to 9 inches—very gravelly loam; 0 to 15 percent
cobbles and stones and 50 to 70 percent pebbles
(by weight); platy structure; slightly hard, friable;
mildly alkaline (pH 7.8); nonsaline (less than 2
mmhos/cm); nonsodic (SAR less than 2); estimated
Unified classification—GM, GM-GC; estimated
AASHTO classification—A-1, A-2, A-4
9 to 35 inches—very gravelly clay loam; 10 to 25
percent cobbles and stones and 55 to 70 percent
pebbles (by weight); subangular blocky structure;
slightly hard, friable; mildly alkaline (pH 8.0);
nonsaline (less than 2 mmhos/cm); nonsodic (SAR
less than 2); estimated Unified classification—GC;
estimated AASHTO classification—A-2
35 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60
inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 2.7 to 3.4 inches
Water-supplying capacity: About 10 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.17; T value—
2; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: The eroded upper side slopes of
mountains
Distinctive present vegetation: Black sagebrush, Utah
juniper

Inclusion 2
Position on landscape: Concave, north-facing side
slopes of mountains
Distinctive present vegetation: Idaho fescue

Inclusion 3
Position on landscape: Concave side slopes of
mountains
Distinctive present vegetation: Wyoming big sagebrush,
mountain big sagebrush

Inclusion 4
Position on landscape: Concave toe slopes adjacent to
drainageways
Distinctive present vegetation: Basin wildrye, basin big
sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Atlow soil for named elements: Wild
herbaceous plants (nonirrigated)—fair; shrubs
(nonirrigated)—fair

Suitability of the Wiskan soil for named elements: Wild
herbaceous plants (nonirrigated)—fair; shrubs
(nonirrigated)—fair

Ratings and restrictive features of the Atlow soil for
selected uses and practices

Range seeding: Poor—droughty, small stones
Daily cover for landfill: Poor—depth to bedrock, small
stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock,
slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Wiskan soil for
selected uses and practices

Range seeding: Poor—small stones
Daily cover for landfill: Poor—small stones, slope, depth
to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Atlow—VIIe, nonirrigated;
Wiskan—VIIIs, nonirrigated
Range site: Atlow—024X030N; Wiskan—024X031N

703—Atlow, steep-Daick-Atlow association

Map Unit Setting

Position on landscape: Mountains
Elevation: 5,000 to 6,000 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Composition

Major components:
- A low very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Hapludalfs, loamy-skeletal, mixed, mesic—40 percent
- Daick very coarse gravelly loamy sand, 30 to 50 percent slopes—Typic Torroriorthents, clayey, montmorillonitic (calcereous), mesic, shallow—30 percent
- A low very gravelly loam, 4 to 15 percent slopes—Lithic Xerollic Hapludalfs, loamy-skeletal, mixed, mesic—15 percent

Contrasting inclusions:
- Inclusion 1: Xeric Torroriorthents cobbly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torroriorthents, coarse-loamy, mixed (calcereous), mesic—7 percent
- Inclusion 2: Xeric Torroriorthents cobbly loam, 30 to 50 percent slopes—Xeric Hapludalfs, fine, montmorillonitic, mesic—4 percent
- Inclusion 3: Xeric Torroriorthents cobbly loam, 30 to 50 percent slopes—Xeric Hapludalfs, loamy-skeletal, mixed, mesic—3 percent
- Inclusion 4: Xeric Torroriorthents cobbly loam, 30 to 50 percent slopes—Xeric Torroriorthents, clayey, montmorillonitic, mesic, shallow—1 percent

Characteristics of the Steep Aillow Soil

Position on landscape: North-, east-, and west-facing side slopes of mountains
Parent material: Kind—residuum; source—tuffaceous rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, Sandberg bluegrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—62

Typical profile

0 to 6 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6
6 to 15 inches—very gravelly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7
15 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.1 to 1.4 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—0.20; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate

Characteristics of the Daick Soil

Position on landscape: South-facing side slopes of mountains and hills
Parent material: Kind—residuum; source—tuffaceous rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, Bailey greasewood
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—20

Typical profile

0 to 4 inches—cobbly clay; 15 to 25 percent cobbles and stones and 10 to 30 percent pebbles (by weight); massive, hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-7
4 inches—weathered bedrock

Soil and water features

Depth to bedrock: 4 to 14 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 0.5 to 0.6 inch
Water-supplying capacity: About 4 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—24; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

**Characteristics of the Strongly Sloping Atlow Soil**

**Position on landscape:** Crests of mountains  
**Parent material:** Kind—residuum; source—chert, rhyolitic tuff, argillite, shale, volcanic rocks  
**Slope features:** Length—short; shape—convex  
**Dominant present vegetation:** Black sagebrush, Sandberg bluegrass, bottlebrush squirreltail  
**Rock fragments on the surface:** Kind—gravel, cobbles, stones; percentage of surface covered—62

**Typical profile**

0 to 6 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

6 to 15 inches—very gravelly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

15 inches—unweathered bedrock

**Soil and water features**

**Depth to bedrock:** 14 to 20 inches  
**Depth to a seasonal high water table:** More than 60 inches  
**Flooding:** None  
**Permeability:** Moderately slow  
**Available water capacity:** 1.1 to 1.4 inches  
**Water-supplying capacity:** About 8 inches  
**Runoff:** Medium  
**Hydriclogic group:** D  
**Erosion factors (surface layer):** K value—.17; T value—2; wind erodibility group—7  
**Hazard of erosion:** By water—slight; by wind—slight  
**Shrink-swell potential:** Moderate  
**Corrosivity:** To steel—high; to concrete—low  
**Potential for frost action:** Moderate

**Inclusion 2**

**Position on landscape:** Concave side slopes of mountains  
**Distinctive present vegetation:** Indian ricegrass, black sagebrush

**Inclusion 3**

**Position on landscape:** Convex foot slopes of mountains  
**Distinctive present vegetation:** Wyoming big sagebrush

**Inclusion 4**

**Position on landscape:** Eroded side slopes of mountains  
**Distinctive present vegetation:** Utah juniper

**Other minor inclusions**
- Areas on mountain crests

**Major Uses**

**Current uses:** Rangeland, wildlife habitat  
**Wildlife habitat elements**

**Suitability of the steep Atlow soil for named elements:**  
Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
**Suitability of the Daick soil for named elements:** Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
**Suitability of the strongly sloping Atlow soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the steep Atlow soil for selected uses and practices**

**Range seeding:** Poor—droughty, small stones  
**Daily cover for landfill:** Poor—depth to bedrock, small stones, slope  
**Shallow excavations:** Severe—depth to bedrock, slope  
**Local roads and streets:** Severe—depth to bedrock, slope  
**Roadfill:** Poor—depth to bedrock, slope  
**Sand:** Improbable source—excess fines  
**Gravel:** Improbable source—excess fines  
**Topsoil:** Poor—depth to bedrock, small stones, slope  
**Pond reservoir areas:** Severe—depth to bedrock, slope  
**Embankments, dikes, and levees:** Severe—thin layer

**Ratings and restrictive features of the Daick soil for selected uses and practices**

**Range seeding:** Poor—too arid, droughty, depth to bedrock  
**Daily cover for landfill:** Poor—depth to bedrock, slope  
**Shallow excavations:** Severe—depth to bedrock, slope  
**Local roads and streets:** Severe—depth to bedrock, slope  
**Roadfill:** Poor—depth to bedrock, slope  
**Sand:** Improbable source—excess fines  
**Gravel:** Improbable source—excess fines  
**Topsoil:** Poor—depth to bedrock, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the strongly
sloping Atlow soil for selected uses and
practices

Range seeding: Poor—droughty, small stones
Daily cover for landfills: Poor—depth to bedrock, small
stones
Shallow excavations: Severe—depth to bedrock
Local roads and streets: Severe—depth to bedrock
Roadfill: Poor—depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones
Pond reservoir areas: Severe—depth to bedrock
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups
Capability classification: Atlow, steep—VIIe, nonirrigated;
Daick—VIIe, nonirrigated; Atlow, strongly sloping—
VIIe, nonirrigated
Range site: Atlow, steep—024X030N; Daick—
027X027N; Atlow, strongly sloping—024X030N

704—Atlow, steep—Hoot—Atlow association

Map Unit Setting
Position on landscape: Side slopes on mountains
Elevation: 4,500 to 5,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days

Composition
Major components:
• Atlow very gravelly loam, 30 to 50 percent slopes—
Lithic Xerolic Haplargids, loamy-skeletal, mixed, 
mesic—45 percent
• Hoot very cobbly loam, 30 to 50 percent slopes—
Lithic Haplargids, loamy-skeletal, mixed, mesic—25
percent
• Atlow very gravelly loam, 4 to 15 percent slopes—
Lithic Xerolic Haplargids, loamy-skeletal, mixed, 
mesic—15 percent
Contrasting inclusions:
• Inclusion 1: Lithic Xerolic Haplargids very cobbly 
loam, 30 to 50 percent slopes—Lithic Xerolic 
Haplargids, loamy, mixed, mesic—7 percent
• Inclusion 2: Rubble land—5 percent
• Inclusion 3: Duric Natargids very cobbly loam, 4 to 15
percent slopes—Duric Natargids, fine, montmorillonitic, 
mesic—3 percent

Characteristics of the Steep Atlow Soil
Position on landscape: North- and east-facing side
slopes of mountains
Parent material: Kind—residuum; source—chert, 
argillite, shale, rhyolitic tuff, other volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, 
Sandberg bluegrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, 
estones; percentage of surface covered—62

Typical profile
0 to 6 inches—very gravelly loam; 0 to 15 percent 
cobbles and stones and 50 to 70 percent pebbles 
(by weight); platy structure; slightly hard, very 
 friable; moderately alkaline (pH 8.2); nonsaline (less 
 than 2 mmhos/cm); nonsodic (SAR less than 13); 
estimated Unified classification—GC, SC; estimated 
AASHTO classification—A-2, A-6
6 to 15 inches—very gravelly clay loam; 0 to 45 percent 
cobbles and stones and 50 to 75 percent pebbles 
(by weight); subangular blocky structure; slightly 
hard, friable; moderately alkaline (pH 8.2); 
nonsaline (less than 2 mmhos/cm); nonsodic (SAR 
less than 13); estimated Unified classification—GC; 
estimated AASHTO classification—A-2, A-6, A-7
15 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60
inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.1 to 1.4 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.17; T value—
1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Hoot Soil
Position on landscape: South- and west-facing side
slopes of mountains
Parent material: Kind—residuum; source—andesite, 
rhyolite, quartzite, phyllite
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud 
sagebrush, spiny hopsage, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—55

Typical profile

0 to 4 inches—very cobbly loam; 25 to 45 percent cobbles and stones and 35 to 55 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); non sodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4

4 to 14 inches—extremely gravelly clay loam; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); subangular blocky structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); non sodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2

14 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 10 to 20 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Moderately slow

Available water capacity: 0.8 inch to 1.2 inches

Water-supplying capacity: About 6 inches

Runoff: Rapid

Hydrologic group: D

Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—7

Hazard of erosion: By water—moderate; by wind—slight

Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Low

Characteristics of the Strongly Sloping Aflow Soil

Position on landscape: Crests of mountains

Parent material: Kind—residuum; source—chert, argillite, shale, rhylolitic tuff, other volcanic rocks

Slope features: Length—short; shape—convex

Dominant present vegetation: Black sagebrush, Sandberg bluegrass, bottlebrush squirreltail

Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—62

Typical profile

0 to 6 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); non sodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6

6 to 15 inches—very gravelly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); non sodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

15 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 14 to 20 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Moderately slow

Available water capacity: 1.1 to 1.4 inches

Water-supplying capacity: About 8 inches

Runoff: Medium

Hydrologic group: D

Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—7

Hazard of erosion: By water—slight; by wind—slight

Shrink-swell potential: Moderate

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1

Position on landscape: Convex, south-facing shoulder slopes of mountains

Distinctive present vegetation: Wyoming big sagebrush

Inclusion 2

Position on landscape: Side slopes of mountains

Distinctive present vegetation: Barren

Inclusion 3

Position on landscape: Alluvial fans adjacent to foot slopes of mountains

Distinctive present vegetation: Shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the steep Aflow soil for named elements:

Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Hoot soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the strongly sloping Aflow soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Ratings and restrictive features of the steep Atlow soil for selected uses and practices

Range seeding: Poor—droughty, small stones  
Daily cover for landfill: Poor—depth to bedrock, small stones, slope  
Shallow excavations: Severe—depth to bedrock, slope  
Local roads and streets: Severe—depth to bedrock, slope  
Roadfill: Poor—depth to bedrock, slope  
Sand: Improbable source—excess fines  
Gravel: Improbable source—excess fines  
Topsoil: Poor—depth to bedrock, small stones, slope  
Pond reservoir areas: Severe—depth to bedrock, slope  
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Hoot soil for selected uses and practices

Range seeding: Poor—droughty, small stones, too arid  
Daily cover for landfill: Poor—small stones, slope, depth to bedrock  
Shallow excavations: Severe—depth to bedrock, slope  
Local roads and streets: Severe—depth to bedrock, slope  
Roadfill: Poor—depth to bedrock, slope  
Sand: Improbable source—excess fines  
Gravel: Improbable source—excess fines  
Topsoil: Poor—depth to bedrock, slope, small stones  
Pond reservoir areas: Severe—depth to bedrock, slope  
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the strongly sloping Atlow soil for selected uses and practices

Range seeding: Poor—droughty, small stones  
Daily cover for landfill: Poor—depth to bedrock, small stones  
Shallow excavations: Severe—depth to bedrock  
Local roads and streets: Severe—depth to bedrock  
Roadfill: Poor—depth to bedrock  
Sand: Improbable source—excess fines  
Gravel: Improbable source—excess fines  
Topsoil: Poor—depth to bedrock, small stones  
Pond reservoir areas: Severe—depth to bedrock  
Embankments, dikes, and levees: Severe—thin layer

750—Snapp-Oxcorel association

Map Unit Setting
Position on landscape: Fan piedmonts  
Elevation: 4,500 to 5,500 feet  
Average annual precipitation: About 8 inches  
Average annual air temperature: About 48 degrees F  
Frost-free period: About 110 days

Composition
Major components:
- Snapp very fine sandy loam, 2 to 8 percent slopes—Durixerolic Natargids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—50 percent  
- Oxcorel gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natargids, fine, montmorillonitic, mesic—40 percent

Contrasting inclusions:
- Inclusion 1: Trocken Variant cobbly loam, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent  
- Inclusion 2: Xeric Torriorthents loam, 0 to 4 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

Characteristics of the Snapp Soil
Position on landscape: The upper part of fan piedmont remnants  
Parent material: Mixed alluvium  
Slope features: Length—long; shape—slightly convex  
Dominant present vegetation: Wyoming big sagebrush, bottlebrush squirreltail  
Rock fragments on the surface: Kind—gravel; percentage of surface covered—5

Typical profile
0 to 9 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4  
9 to 28 inches—gravely clay; 25 to 50 percent pebbles (by weight); prismatic structure; hard, firm; very strongly alkaline (pH 9.6); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CH, GC; estimated AASHTO classification—A-7  
28 to 39 inches—gravely clay loam; 25 to 50 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6, A-7

Interpretive Groups
Capability classification: Atlow, steep—VIIe, nonirrigated; Hoot—VIIIs, nonirrigated; Atlow, strongly sloping—VIIIs, nonirrigated  
Range site: Atlow, steep—024X030N; Hoot—024X002N; Atlow, strongly sloping—024X030N
39 to 60 inches—very gravelly loamy sand; 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 5.6 to 7.4 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (surface layer): K value—.28; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Moderate

Characteristics of the Oxcorel Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium somewhat influenced by loess
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—24

Typical profile

0 to 8 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-4
8 to 34 inches—clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7
34 to 60 inches or more—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 6.1 to 8.0 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Narrow drainageways on fan piedmonts
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Inclusion 2
Position on landscape: Slightly concave inset fans
Distinctive present vegetation: Basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Snapp soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Oxcorel soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Snapp soil for selected uses and practices

Range seeding: Fair—excess salt, excess sodium, too crusty
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, too clayey

Pond reservoir areas: Moderate—seepage, slope

Embankments, dikes, and levees: Severe—seepage, excess sodium

Drainage: Deep to water

Irrigation: Droughty, slope, soil blowing

Terraces and diversions: Erodes easily, too sandy

**Ratings and restrictive features of the Oxcrol soil for selected uses and practices**

Range seeding: Poor—too arid, too crusty, excess sodium

Daily cover for landfill: Poor—small stones

Shallow excavations: Moderate—too clayey

Local roads and streets: Severe—low strength, shrink-swell

Roadfill: Good

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Topsoil: Poor—small stones, excess sodium, area reclaim

Pond reservoir areas: Severe—seepage

Embankments, dikes, and levees: Severe—seepage, excess sodium

Drainage: Deep to water

Irrigation: Percs slowly, slope, excess sodium

Terraces and diversions: Favorable

**Interpretive Groups**

Capability classification: Snapp—Ille, irrigated, and VIs, nonirrigated; Oxcrol—IVe, irrigated, and VIIs, nonirrigated

Range site: Snapp—024X005N; Oxcrol—024X002N

**751—Snapp-Sodhouse association**

**Map Unit Setting**

Position on landscape: Fan piedmonts

Elevation: 4,500 to 5,000 feet

Average annual precipitation: About 8 inches

Average annual air temperature: About 48 degrees F

Frost-free period: About 110 days

**Composition**

Major components:

* Snapp loam, 2 to 8 percent slopes—Durixerolic Natragards, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—60 percent

* Sodhouse very fine sandy loam, 2 to 8 percent slopes—Typic Durothids, loamy, mixed, mesic, shallow—30 percent

Contrasting inclusions:

* Inclusion 1: Trocken Variant cobbly loam, 0 to 4 percent slopes—Xeric Torromorthents, loamy-skeletal, mixed (calcareous), mesic—10 percent

**Characteristics of the Snapp Soil**

Position on landscape: The upper part of fan piedmont remnants

Parent material: Mixed alluvium

Slope features: Length—long; shape—slightly convex

Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

Rock fragments on the surface: Kind—gravel; percentage of surface covered—5

**Typical profile**

0 to 9 inches—loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

9 to 28 inches—gravelly clay; 25 to 50 percent pebbles (by weight); prismatic structure; hard, firm; very strongly alkaline (pH 9.6); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CH, GC; estimated AASHTO classification—A-7

28 to 39 inches—gravelly clay loam; 25 to 50 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL, GC; estimated AASHTO classification—A-7

39 to 60 inches—very gravelly loamy sand; 50 to 85 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

**Soil and water features**

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Slow

Available water capacity: 5.6 to 7.4 inches

Water-supplying capacity: About 7 inches

Runoff: Medium

Hydrologic group: C

Erosion factors (surface layer): K value—0.37; T value—3; wind erodibility group—5

Hazard of erosion: By water—slight; by wind—slight

Shrink-swell potential: High

Corrosivity: To steel—high; to concrete—high

Potential for frost action: Moderate
Characteristics of the Sodhouse Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium and loess
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail

Typical profile

0 to 5 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
5 to 14 inches—very fine sandy loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
14 to 29 inches—indurated layer; massive; extremely hard, extremely firm
29 to 60 inches—extremely gravelly sandy loam; 5 to 20 percent cobbles and stones; 75 to 85 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—moderate
Available water capacity: 1.5 to 2.2 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.55; T value—1; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Narrow drainageways on fan piedmonts

Distinctive present vegetation: Bottlebrush squirreltail, Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat
Wildlife habitat elements

Suitability of the Snapp soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Sodhouse soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Snapp soil for selected uses and practices

Range seeding: Fair—excess salt, excess sodium, too crusty
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—frost action
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, too clayey
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—seepage, excess sodium
Drainage: Deep to water
Irrigation: Droughty, slope
Terraces and diversions: Erodes easily, too sandy

Ratings and restrictive features of the Sodhouse soil for selected uses and practices

Range seeding: Poor—too arid, droughty
Daily cover for landfill: Poor—cemented pan, seepage, small stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan
Roadfill: Poor—cemented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—cemented pan, area reclaim
Pond reservoir areas: Severe—cemented pan, seepage
Embankments, dikes, and levees: Severe—seepage

Interpretive Groups

Capability classification: Snapp—Ile, irrigated, and IIs, nonirrigated; Sodhouse—IIs, nonirrigated
Range site: Snapp—024X005N; Sodhouse—024X002N
752—Snapp-Orovada association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,500 to 5,500 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Snapp very fine sandy loam, 2 to 8 percent slopes—Durixerolitic Natargids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—50 percent
- Orovada very fine sandy loam, 2 to 8 percent slopes—Durixerolitic Camborthids, coarse-loamy, mixed, mesic—40 percent

Contrasting inclusions:
- Inclusion 1: Fluvaquentic Torriorthents loam, 2 to 8 percent slopes—Fluvaquentic Torriorthents, coarse-loamy, mixed (calcereous), mesic—10 percent

Characteristics of the Snapp Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravely; percentage of surface covered—5

Typical profile

0 to 9 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
9 to 28 inches—gravely clay; 25 to 50 percent pebbles (by weight); prismatic structure; hard, firm; very strongly alkaline (pH 9.6); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CH, GC; estimated AASHTO classification—A-7
28 to 39 inches—gravely clay loam; 25 to 50 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL, GC; estimated AASHTO classification—A-6, A-7
39 to 60 inches—very gravelly loamy sand; 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 5.6 to 7.4 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (surface layer): K value—.37; T value—3; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Moderate

Characteristics of the Orovada Soil

Position on landscape: Inset fans
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail

Typical profile

0 to 11 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
11 to 29 inches—loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
29 to 60 inches—very fine sandy loam; 5 to 25 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 9.0 to 10.2 inches
Water-supplying capacity: About 8 inches
Runoff: Slow  
Hydrologic group: B  
Erosion factors (surface layer): K value—.49; T value—5; wind erodibility group—3  
Hazard of erosion: By water—slight; by wind—slight  
Shrink-swell potential: Low  
Corrosivity: To steel—high; to concrete—low  
Potential for frost action: Moderate

Contrasting Inclusions
Inclusion 1  
Position on landscape: Narrow drainageways on fan piedmonts  
Distinctive present vegetation: Basin big sagebrush

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Snapp soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Orohada soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Snapp soil for selected uses and practices
Range seeding: Fair—excess salt, excess sodium, too crusty  
Daily cover for landfill: Poor—seepage, small stones  
Shallow excavations: Severe—cutbanks cave  
Local roads and streets: Moderate—frost action  
Roadfill: Good  
Sand: Probable source  
Gravel: Probable source  
Topsoil: Poor—small stones, area reclaim, too clayey  
Pond reservoir areas: Moderate—seepage, slope  
Embankments, dikes, and levees: Severe—seepage, excess sodium  
Drainage: Deep to water  
Irrigation: Droughty, slope, soil blowing  
Terraces and diversions: Erodes easily, too sandy

Ratings and restrictive features of the Orohada soil for selected uses and practices
Range seeding: Fair—too arid, too crusty  
Daily cover for landfill: Good  
Shallow excavations: Slight  
Local roads and streets: Moderate—frost action  
Roadfill: Good  
Sand: Improbable source—excess fines  
Gravel: Improbable source—excess fines  
Topsoil: Small stones, thin layer  
Pond reservoir areas: Moderate—seepage, slope  
Embankments, dikes, and levees: Severe—piping  
Drainage: Deep to water  
Irrigation: Erodes easily, slope  
Terraces and diversions: Erodes easily

Interpretive Groups
Capability classification: Snapp—IIne, irrigated, and VIs, nonirrigated; Orohada—IIne, irrigated, and VIs, nonirrigated  
Range site: Snapp—024X005N; Orohada—024X020N

812—Boton-Playas association

Map Unit Setting
Position on landscape: Lake plain terraces  
Elevation: 4,000 to 4,200 feet  
Average annual precipitation: About 7 inches  
Average annual air temperature: About 53 degrees F  
Frost-free period: About 130 days

Composition
Major components:
- Boton silt loam, 0 to 2 percent slopes—Durothidic Torriorthents, fine-silty, mixed (calcareous), mesic—50 percent  
- Playas—35 percent  
Contrasting inclusions:
- Inclusion 1: Duric Camborthids silt loam, 0 to 2 percent slopes—Duric Camborthids, coarse-silty, mixed, mesic—5 percent  
- Inclusion 2: Durothidic Torriorthents silt loam, 0 to 2 percent slopes—Durothidic Torriorthents, coarse-silty, mixed (calcareous), mesic—5 percent  
- Inclusion 3: Aquic Torriorthents silt loam, 0 to 2 percent slopes—Aquic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

Characteristics of the Boton Soil
Position on landscape: Low cuppice mounds on lowlying lake plain terraces  
Parent material: Mixed alluvium influenced by loess and volcanic ash and overlying lacustrine sediments  
Slope features: Length—short; shape—convex  
Dominant present vegetation: Shadscale, black greasewood, bottlebrush squirreltail

Typical profile
0 to 3 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); slightly sodic or moderately
sodic (SAR 13 to 45); estimated Unified classification—ML; estimated AASHTO classification—A-4
3 to 60 inches—silt loam; massive; slightly hard, friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-4, A-6

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 11.4 to 12.6 inches
Water-supplying capacity: About 6 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Playas

Position on landscape: Intercoppice mound areas on low-lying lake plain terraces
Slope features: Length—short; shape—concave

Contrasting Inclusions

Inclusion 1
Position on landscape: The slightly convex upper part of lake plain terraces adjacent to fan skirts
Distinctive present vegetation: Bluegrass, shadscale

Inclusion 2
Position on landscape: The slightly concave upper part of lake plain terraces adjacent to fan skirts
Distinctive present vegetation: Bottlebrush squirreltail, shadscale

Inclusion 3
Position on landscape: The slightly convex lower part of lake plain terraces adjacent to playas
Distinctive present vegetation: Basin wildrye, black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Boton soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Boton soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Severe—low strength
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt, excess sodium, piping
Drainage: Deep to water
Irrigation: Erodes easily, excess salt
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: Boton—IIIs, irrigated, and VIIIs, nonirrigated; Playas—VIIIs
Range site: Boton—027X024N

813—Batan-Wendane-Valmy association

Map Unit Setting

Position on landscape: Alluvial flats
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Batan silt loam, 0 to 2 percent slopes—Durorthid Torriorthents, fine-silty, mixed (calcareous), mesic—40 percent
- Wendane silt loam, drained, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—25 percent
- Valmy silt loam, 0 to 2 percent slopes—Durorthid Torriorthents, coarse-loamy, mixed (calcareous), mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Typic Torriorthents loamy sand, 2 to 8 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 2: Durorthid Xeric Torriorthents silt loam, 0 to 2 percent slopes—Durorthid Xeric Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 3: Misad very gravelly very fine sandy loam, moderately saline-sodic, 0 to 2 percent slopes—Durorthid Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
Characteristics of the Batan Soil

Position on landscape: Alluvial flats
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, black greasewood, seepweed

Typical profile

0 to 3 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—ML; estimated AASHTO classification—A-4
3 to 60 inches—stratified fine sandy loam to silty clay; massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic or strongly sodic (SAR more than 23); estimated Unified classification—CL; estimated AASHTO classification—A-6

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 11.4 to 12.6 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Wendane Soil

Position on landscape: Alluvial flat remnants
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Torrey quailbush, black greasewood, shadscale

Typical profile

0 to 11 inches—silt loam; platy structure; slightly hard, friable; very strongly alkaline (pH 9.4); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
3 to 60 inches—stratified very fine sandy loam to gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2, A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 9.0 to 10.2 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Thin sand sheets over alluvial flats
Distinctive present vegetation: Inland saltgrass, black greasewood

Inclusion 2
Position on landscape: Narrow drainageways on alluvial flats
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Inclusion 3
Position on landscape: Slightly convex alluvial flats adjacent to fan skirts
Distinctive present vegetation: Bottlebrush squirreltail, shadscale

Major Uses

Current uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Batan soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Wendane soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Valmy soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Batan soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too arid
Daily cover for landfill: Good
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, too clayey

Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt, excess sodium
Drainage: Deep to water
Irrigation: Excess salt
Terraces and diversions: Erodes easily

Ratings and restrictive features of the Wendane soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too crusty
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Roadfill: Fair—low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, small stones
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping, excess salt, excess sodium

Ratings and restrictive features of the Valmy soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Fair—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Moderate—seepage, small stones
Drainage: Deep to water
Irrigation: Droughty, erodes easily
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: Batan—I/Ic, irrigated, and VIIc, nonirrigated; Wendane—VIIa, nonirrigated; Valmy—IIIa, irrigated, and VIIa, nonirrigated
Range site: Batan—024X003N; Wendane—024X015N; Valmy—024X022N

814—Batan silt loam, moderately saline-sodic

Map Unit Setting

Position on landscape: Lake plains
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Batan silt loam, moderately saline-sodic, 0 to 2 percent slopes—Durothric Torriorthents, fine-silty, mixed (calcic), mesic—85 percent

Contrasting inclusions:
• Inclusion 1: Needle Peak silt loam, 0 to 2 percent slopes—Aquic Torriorthents, fine-silty, mixed (calcic), mesic—8 percent
• Inclusion 2: Raglan silt loam, moderately saline-alkali, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—7 percent

Characteristics of the Batan Soil

Position on landscape: Lake plain terraces
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, black greasewood, bud sagebrush

Typical profile
0 to 3 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4
3 to 60 inches—stratified fine sandy loam to silty clay; massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic or strongly sodic (SAR more than 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 11.4 to 12.6 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Drainageways

Distinctive present vegetation: Basin big sagebrush

Inclusion 2

Position on landscape: Smooth alluvial flats
Distinctive present vegetation: Shadscale, black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Batan soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Batan soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too arid
Daily cover for landfill: Good
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, too clayey
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt, excess sodium
Drainage: Deep to water
Irrigation: Excess salt
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: Ills, irrigated, and VII, nonirrigated
Range site: 024X003N

823—Trocken-Blueewing association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

Composition

Major components:
• Trocken gravelly very fine sandy loam, 4 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcic), mesic—70 percent
• Blueewing very gravelly loamy sand, frequently flooded, 4 to 8 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—15 percent
Contrasting inclusions:
• Inclusion 1: Blueewing loamy sand, 4 to 8 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—6 percent
• Inclusion 2: Typic Haplargids gravelly sandy loam, 4 to 15 percent slopes—Typic Haplargids, loamy-skeletal, mixed, mesic—5 percent
• Inclusion 3: Genegraf loamy sand, 4 to 8 percent slopes—Duric Natragids, fine-loamy, mixed, mesic—4 percent

Characteristics of the Trocken Soil
Position on landscape: Fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

Typical profile
0 to 3 inches—gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); non saline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4
3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobbly loam; 5 to 40 percent cobbles and stones and 60 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 3.0 to 4.8 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.10; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions
Inclusion 1
Position on landscape: Concave fan skirts
Distinctive present vegetation: Bottlebrush squirreltail, shadscale

Inclusion 2
Position on landscape: Convex fan piedmont remnants adjacent to fan skirts
Distinctive present vegetation: Bottlebrush squirreltail, shadscale
Inclusion 3

**Position on landscape:** Convex fan skirts

**Distinctive present vegetation:** Bottlebrush squirreltail, shadscale

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements**

**Suitability of the Trocken soil for named elements:** Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Suitability of the Bluewing soil for named elements:** Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings and restrictive features of the Trocken soil for selected uses and practices**

**Range seeding:** Poor—too arid, small stones, too crusty

**Daily cover for landfill:** Poor—small stones

**Shallow excavations:** Severe—cutbanks cave

**Local roads and streets:** Moderate—large stones

**Roadfill:** Fair—large stones

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Topsoil:** Poor—small stones, area reclaim

**Pond reservoir areas:** Moderate—seepage, slope

**Embankments, dikes, and levees:** Severe—large stones

**Ratings and restrictive features of the Bluewing soil for selected uses and practices**

**Range seeding:** Poor—too arid, too sandy, small stones

**Daily cover for landfill:** Poor—seepage, too sandy, small stones

**Shallow excavations:** Severe—cutbanks cave

**Local roads and streets:** Severe—flooding

**Roadfill:** Good

**Sand:** Probable source

**Gravel:** Probable source

**Topsoil:** Poor—small stones, area reclaim

**Pond reservoir areas:** Severe—seepage

**Embankments, dikes, and levees:** Severe—seepage

**Interpretive Groups**

**Capability classification:** Trocken—Vlls, nonirrigated; Bluewing—Vllw, nonirrigated

**Range site:** Trocken—027X028N; Bluewing—027X022N

825—Trocken very gravelly very fine sandy loam, moderately saline-sodic, 2 to 4 percent slopes

**Map Unit Setting**

**Position on landscape:** Fan skirts

**Elevation:** 4,000 to 4,500 feet

**Average annual precipitation:** About 7 inches

**Average annual air temperature:** About 50 degrees F

**Frost-free period:** About 110 days

**Composition**

**Major component:**

- Trockeen very gravelly very fine sandy loam, moderately saline-sodic, 2 to 4 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—90 percent

**Contrasting inclusions:**

- Inclusion 1: Yobe silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent

- Inclusion 2: Typic Torriorthents cobble loam, rarely flooded, 2 to 4 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

**Characteristics of the Trocken Soil**

**Position on landscape:** Fan skirts

**Parent material:** Mixed alluvium

**Slope features:** Length—long; shape—convex

**Dominant present vegetation:** Black greasewood, Bailey greasewood, shadscale

**Rock fragments on the surface:** Kind—gravel, cobbles; percentage of surface covered—55

**Typical profile**

0 to 3 inches—very gravelly very fine sandy loam; 0 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobbly loam; 5 to 40 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Moderate

**Available water capacity:** 3.0 to 4.8 inches

**Water-supplying capacity:** About 6 inches

**Runoff:** Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.20; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly concave fan skirts
Distinctive present vegetation: Torrey quailbush, inland saltgrass

Inclusion 2
Position on landscape: Narrow drainageways on fan skirts
Distinctive present vegetation: Rabbitbrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Trocken soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Trocken soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—small stones, seepage
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—large stones
Roadfill: Fair—large stones
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—excess salt, slope, large stones

Interpretive Groups
Capability classification: VIls, nonirrigated
Range site: 027X024N

Composition

Major components:
- Trocken very fine sandy loam, moderately saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—50 percent
- Ragtown loam, 0 to 2 percent slopes—Typic Torriorthents, fine, montmorillonitic (calcareous), mesic—35 percent

Contrasting inclusions:
- Inclusion 1: Typic Camborthids loam, 0 to 2 percent slopes—Typic Camborthids, fine-loamy, mixed, mesic—9 percent
- Inclusion 2: Typic Camborthids silt loam, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—4 percent
- Inclusion 3: Playas—2 percent

Characteristics of the Trocken Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, seepweed
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—16

Typical profile
0 to 3 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4
3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobbly loam; 5 to 20 percent cobbles and stones and 50 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 3.0 to 4.8 inches
Water-supplying capacity: About 6 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—3

826—Trocken-Ragtown association

Map Unit Setting

Position on landscape: Fan skirts, lake plains
Elevation: 4,000 to 4,200 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 120 days
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Ragtown Soil

Position on landscape: Lake plain terraces
Parent material: Lacustrine sediments derived from mixed rock sources
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Black greasewood, shadscale, seepweed

Typical profile

0 to 7 inches—loam; 0 to 5 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
7 to 20 inches—silty clay loam; massive; slightly hard, friable; very strongly alkaline (pH 9.4); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
20 to 65 inches—stratified silty clay loam to clay; massive; slightly hard, friable; very strongly alkaline (pH 9.2); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—CL, CH, MH; estimated AASHTO classification—A-7

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 9.5 to 11.0 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (surface layer): K value—.37; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Inclusion 2
Position on landscape: Slightly concave lake plain terraces
Distinctive present vegetation: Black greasewood

Inclusion 3
Position on landscape: Lake plains
Distinctive present vegetation: Barren

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Trocken soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Ragtown soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Trocken soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—excess salt, seepage, large stones

Ratings and restrictive features of the Ragtown soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—hard to pack
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Poor—low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium, too clayey
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt, excess sodium, hard to pack

Interpretive Groups

Capability classification: Trocken—VII, nonirrigated; Ragtown—VII, nonirrigated
Range site: Trocken—027X024N; Ragtown—027X025N
827—Trocken gravelly very fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

Position on landscape: Fan skirts
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 120 days

Composition

Major component:
• Trocken gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—90 percent

Contrasting inclusions:
• Inclusion 1: Typic Haplagnids gravelly very fine sandy loam, 4 to 15 percent slopes—Typic Haplagnids, loamy-skeletal, mixed, mesic—5 percent
• Inclusion 2: Mazuma silt loam, strongly saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

Characteristics of the Trocken Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

Typical profile

0 to 3 inches—gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4
3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobbly loam; 5 to 40 percent cobbles and stones and 60 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

Soil and water features

Available water capacity: 3.0 to 4.8 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—32; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex fan piedmont remnants adjacent to fan skirts
Distinctive present vegetation: Bailey greasewood

Inclusion 2
Position on landscape: Slightly concave inset fans
Distinctive present vegetation: Black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Trocken soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Trocken soil for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—large stones
Roadfill: Fair—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—large stones

Interpretive Groups

Capability classification: VIIs, nonirrigated
Range site: 027X028N

831—Benin-Yobe-Wendane association

Map Unit Setting

Position on landscape: Lake plains, alluvial flats
Elevation: 3,700 to 4,500 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 51 degrees F
Frost-free period: About 120 days
**Composition**

Major components:
- Benin silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine, montmorillonitic (calcareous), mesic—40 percent
- Yobe silt loam, warm, occasionally flooded, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—30 percent
- Wendane silt loam, warm, drained, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Duric Camborthids silt loam, 0 to 2 percent slopes—Duric Camborthids, fine-loamy, mixed, mesic—10 percent

**Characteristics of the Benin Soil**

Position on landscape: The upper part of lake plain terraces

Parent material: Loess over lacustrine sediments

Slope features: Length—long; shape—slightly concave

Dominant present vegetation: Shadscale, black greasewood, spiny hopsage, bottlebrush squirreltail

Rock fragments on the surface: Kind—gravel; percentage of surface covered—2

**Typical profile**

0 to 9 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

9 to 60 inches—clay; prismatic structure; hard, firm; strongly alkaline (pH 9.0); slightly saline or moderately saline (4 to 16 mmhos/cm); strongly sodic (SAR 46); estimated Unified classification—CL, CH, MH; estimated AASHTO classification—A-7

**Soil and water features**

Depth to a seasonal high water table: More than 60 inches

Flooding: Rare

Permeability: Very slow

Available water capacity: 8.7 to 9.9 inches

Water-supplying capacity: About 6 inches

Runoff: Very slow

Hydrologic group: D

Erosion factors (surface layer): K value—.49; T value—5; wind erodibility group—4L

Hazard of erosion: By water—slight; by wind—slight

Shrink-swell potential: High

Corrosivity: To steel—high; to concrete—high

Potential for frost action: Low

**Characteristics of the Yobe Soil**

Position on landscape: Lake plain terraces

Parent material: Lacustrine sediments derived from mixed rock sources

Slope features: Length—long; shape—slightly concave

Dominant present vegetation: Black greasewood, basin wildrye, alkali sacaton

**Typical profile**

0 to 14 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

14 to 60 inches—stratified very fine sandy loam to silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

**Soil and water features**

Depth to a seasonal high water table: November through May—36 to 60 inches; rest of year—60 inches

Flooding: Frequency—occasional; duration—brief; months—February through June

Permeability: Moderately slow

Available water capacity: 11.4 to 12.6 inches

Water-supplying capacity: About 10 inches

Runoff: Ponded

Hydrologic group: C

Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—4L

Hazard of erosion: By water—slight; by wind—slight

Shrink-swell potential: Moderate

Corrosivity: To steel—high; to concrete—moderate

Potential for frost action: High

**Characteristics of the Wendane Soil**

Position on landscape: Alluvial flats

Parent material: Silty alluvium derived from mixed sediments

Slope features: Length—long; shape—slightly concave

Dominant present vegetation: Torrey quailbush, black greasewood, basin wildrye

**Typical profile**

0 to 11 inches—silt loam; platy structure; slightly hard, friable; very strongly alkaline (pH 9.4); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 46); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

11 to 60 inches—silty clay loam; massive; slightly hard, firm; strongly alkaline (pH 8.8); slightly saline or
moderately saline (4 to 16 mmhos/cm); moderately sodic or strongly sodic (SAR 24 to 60); estimated
Unified classification—ML, CL-ML; estimated
AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60
inches
Flooding: Frequency—occasional; duration—brief;
months—December through May
Permeability: Moderately slow
Available water capacity: 10.0 to 12.0 inches
Water-supplying capacity: About 10 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—
5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swelling potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly convex lake plain
terraces adjacent to fan skirts
Distinctive present vegetation: Bailey greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Benin soil for named elements: Grain
and seed crops (irrigated)—poor; domestic grasses
and legumes (irrigated)—poor; wild herbaceous
plants (nonirrigated)—very poor; shrubs
(nonirrigated)—very poor
Suitability of the Yobe soil for named elements: Wild
herbaceous plants (nonirrigated)—very poor; shrubs
(nonirrigated)—very poor; wetland plants—poor;
shallow water areas—fair
Suitability of the Wendane soil for named elements: Wild
herbaceous plants (nonirrigated)—very poor; shrubs
(nonirrigated)—very poor

Ratings and restrictive features of the Benin soil for
selected uses and practices

Range seeding: Poor—too arid, excess salt, too crusty
Daily cover for landfill: Poor—hard to pack
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-
swell
Roadfill: Poor—low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—hard to pack
Drainage: Deep to water
Irrigation: Percs slowly, erodes easily
Terraces and diversions: Erodes easily, percs slowly

Ratings and restrictive features of the Yobe soil for
selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too
crusty
Daily cover for landfill: Poor—excess sodium, excess
salt
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—low strength, flooding,
frost action
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt,
excess sodium

Ratings and restrictive features of the Wendane soil
for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too
crusty
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Roadfill: Fair—low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping,
excess salt, excess sodium

Interpretive Groups

Capability classification: Benin—IVs, irrigated, and VIIIs,
nonirrigated; Yobe—VIIw, nonirrigated; Wendane—
VIIIs, nonirrigated
Range site: Benin—024X003N; Yobe—027X025N;
Wendane—027X041N

900—Roca-Wiskan-Reluctan association

Map Unit Setting

Position on landscape: Side slopes of mountains
Elevation: 5,800 to 7,500 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 44 degrees F
Frost-free period: About 80 days
Composition

Major components:
- Roca very cobby loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—40 percent
- Wiskan very gravelly loam, 50 to 75 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid—30 percent
- Reluctan gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—15 percent
- Contrasting inclusions:
  - Inclusion 1: Sumya very cobby loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, clayey-skeletal, montmorillonitic, nonacid, frigid—5 percent
  - Inclusion 2: Xerollic Haplargids cobby loam, 30 to 50 percent slopes—Xerollic Haplargids, fine, montmorillonitic, frigid—5 percent
  - Inclusion 3: Rock outcrop—3 percent
  - Inclusion 4: Lithic Xerollic Haplargids very gravelly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—2 percent

Characteristics of the Roca Soil

Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—chert, argillite, siliceous volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, Wyoming big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—cobbles; percentage of surface covered—20

Typical profile

0 to 6 inches—very cobby loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6
6 to 34 inches—very gravelly clay; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2
34 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 3.6 to 4.5 inches
Water-supplying capacity: About 10 inches
Runoff: Rapid

Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

Characteristics of the Wiskan Soil

Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—chert, argillite, siliceous volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, Sandberg bluegrass, bottlebrush squirreltail, rabbitbrush, scattered Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—52

Typical profile

0 to 9 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4
9 to 35 inches—very gravelly clay loam; 10 to 25 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2
35 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 2.7 to 3.4 inches
Water-supplying capacity: About 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.17; T value—2; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Reluctan Soil
Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—rhyolite, other extrusive volcanic rocks
Slope features: Length—short; shape—concave
Dominant present vegetation: Mountain big sagebrush, snowberry, bluebunch wheatgrass, basin wildrye, Idaho fescue
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

Typical profile
0 to 9 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4
9 to 25 inches—gravelly clay loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7
25 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 2.7 to 3.4 inches
Water-supplying capacity: About 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.24; T value—2; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Eroded side slopes of mountains
Distinctive present vegetation: Utah juniper

Inclusion 2
Position on landscape: South-facing side slopes of mountains
Distinctive present vegetation: Bluebunch wheatgrass, basin big sagebrush

Inclusion 3
Position on landscape: Side slopes and crests of mountains
Distinctive present vegetation: Barren

Inclusion 4
Position on landscape: Crests of mountains
Distinctive present vegetation: Low sagebrush

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Roca soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Wiskan soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Reluctan soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Roca soil for selected uses and practices

Range seeding: Poor—large stones
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—slope, depth to bedrock
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Wiskan soil for selected uses and practices

Range seeding: Poor—small stones
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Reluctan soil for selected uses and practices

Range seeding: Poor—erodes easily
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Roca—VII, nonirrigated; Wiskan—VII, nonirrigated; Reluctan—VIIe, nonirrigated
Range site: Roca—024X028N; Wiskan—024X031N; Reluctan—024X021N

901—Roca-Reluctan association

Map Unit Setting

Position on landscape: Mountains
Elevation: 5,800 to 7,000 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days

Composition

Major components:
• Roca very cobbly loam, 30 to 50 percent slopes—Xerollic Haplorgids, clayey-skeletal, montmorillonitic, frigid—50 percent
• Reluctan gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—35 percent
Contrasting inclusions:
• Inclusion 1: Cleavage extremely gravelly loam, 4 to 15 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
• Inclusion 2: Rock outcrop—5 percent
• Inclusion 3: Aridic Haploxerolls loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—3 percent
• Inclusion 4: Aridic Argixerolls very cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—2 percent

Characteristics of the Roca Soil

Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—rhyolite, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, Wyoming big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail, scattered Utah juniper
Rock fragments on the surface: Kind—cobbles; percentage of surface covered—20

Typical profile

0 to 6 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHO classification—A-6
6 to 34 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHO classification—A-2
34 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 3.6 to 4.5 inches
Water-supplying capacity: About 10 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—0; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

Characteristics of the Reluctan Soil

Position on landscape: North- and east-facing side slopes of mountains
Parent material: Kind—residuum; source—rhyolite, other extrusive volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, snowberry, bluebunch wheatgrass, basin wildrye,
Idaho fescue, scattered Utah juniper

*Rock fragments on the surface:* Kind—gravel, cobbles; percentage of surface covered—30

**Typical profile**

0 to 9 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

9 to 25 inches—gravelly clay loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

25 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 20 to 40 inches

*Depth to a seasonal high water table:* More than 60 inches

*Flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.7 to 3.4 inches

*Water-supplying capacity:* About 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential for frost action:* Moderate

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* Crests of mountains

*Distinctive present vegetation:* Low sagebrush

**Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges on mountains

*Distinctive present vegetation:* Barren

**Inclusion 3**

*Position on landscape:* Convex, south-facing shoulder slopes of mountains

*Distinctive present vegetation:* Bluebunch wheatgrass, basin big sagebrush

**Inclusion 4**

*Position on landscape:* Convex, north-facing shoulder slopes of mountains

*Distinctive present vegetation:* Low sagebrush

**Major Uses**

*Current uses:* Rangeland, wildlife habitat

**Wildlife habitat elements**

**Suitability of the Roca soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Suitability of the Reluctan soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the Roca soil for selected uses and practices**

*Range seeding:* Poor—large stones

*Daily cover for landfill:* Poor—small stones, slope, depth to bedrock

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings and restrictive features of the Reluctan soil for selected uses and practices**

*Range seeding:* Poor—erodes easily

*Daily cover for landfill:* Poor—small stones, slope, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—slope

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Roca—VIIa, nonirrigated; Reluctan—VIIe, nonirrigated

*Range site:* Roca—024X028N; Reluctan—024X021N

**902—Roca-Reluctan-Sumya association**

**Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,800 to 7,500 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free period:* About 80 days
**Composition**

*Major components:*
- Roca very cobbly loam, 30 to 50 percent slopes—Xerolic Haplorgids, clayey-skeletal, montmorillonitic, frigid—30 percent
- Reluctan gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—30 percent
- Sumay very cobbly clay loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, clayey-skeletal, montmorillonitic, nonacid, frigid—25 percent

*Contrasting inclusions:*
- Inclusion 1: Wiskan very cobbly loam, 30 to 50 percent slopes—Xerolic Haplorgids, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 2: Cleavage extremely gravelly loam, 4 to 15 percent slopes—Lithic Xeric Calcorthents, loamy-skeletal, mixed, frigid—4 percent
- Inclusion 3: Mulhop very cobbly loam, 30 to 50 percent slopes—Lithic Xeric Calcorthents, loamy-skeletal, mixed, frigid—4 percent
- Inclusion 4: Aridic Haploxerolls very cobbly loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent

**Characteristics of the Roca Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum; source—rhyolite, other extrusive volcanic rocks

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, snowberry, bluebunch wheatgrass, basin wildrye, Idaho fescue

*Rock fragments on the surface:* Kind—gravel, cobbles; percentage of surface covered—20

**Typical profile**

0 to 6 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

6 to 34 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

34 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 20 to 40 inches

*Depth to a seasonal high water table:* More than 60 inches

*Flooding:* None

*Permeability:* Very slow

*Available water capacity:* 3.6 to 4.5 inches

*Water-supplying capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential for frost action:* Low

**Characteristics of the Reluctan Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—residuum; source—rhyolite, other extrusive volcanic rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, snowberry, bluebunch wheatgrass, basin wildrye, Idaho fescue

*Rock fragments on the surface:* Kind—gravel, cobbles; percentage of surface covered—30

**Typical profile**

0 to 9 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4

9 to 25 inches—gravelly clay loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7

25 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 20 to 40 inches

*Depth to a seasonal high water table:* More than 60 inches

*Flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 2.7 to 3.4 inches
Water-supplying capacity: About 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.24; T value—2; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

**Characteristics of the Sumya Soil**

Position on landscape: Eroded side slopes on mountains
Parent material: Kind—residuum; source—andesite, breccia
Slope features: Length—long; shape—concave to convex
Dominant present vegetation: Utah juniper, bluebunch wheatgrass, mountain big sagebrush
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—43

**Typical profile**

- 0 to 4 inches—very cobbly clay loam; 25 to 45 percent cobbles and stones and 35 to 55 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7
- 4 to 9 inches—very gravelly clay; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

- 9 inches—unweathered bedrock

**Soil and water features**

Depth to bedrock: 8 to 12 inches
Flooding: None
Permeability: Slow
Available water capacity: 0.5 to 0.8 inch
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

**Contrasting Inclusions**

**Inclusion 1**

- Position on landscape: Convex side slopes on mountains
- Distinctive present vegetation: Black sagebrush

**Inclusion 2**

- Position on landscape: Convex crests of mountains
- Distinctive present vegetation: Low sagebrush

**Inclusion 3**

- Position on landscape: Convex back slopes of mountains
- Distinctive present vegetation: Utah juniper, black sagebrush

**Inclusion 4**

- Position on landscape: Convex, north-facing foot slopes of mountains
- Distinctive present vegetation: Basin big sagebrush, bluebunch wheatgrass

**Other minor inclusions**

- Scattered barren areas on small peaks and ridges
- Concave areas in stream channels that support basin big sagebrush

**Major Uses**

Current uses: Rangeland, wildlife habitat

**Ratings of the Sumya soil for use as woodland**

Site index for common trees: Utah juniper—20
Most important native understory plants: Wyoming big sagebrush, bluebunch wheatgrass, Thurbere needlegrass

**Wildlife habitat elements**

Suitability of the Roca soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Reluctan soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Sumya soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; coniferous plants (nonirrigated)—poor

**Ratings and restrictive features of the Roca soil for selected uses and practices**

Range seeding: Poor—large stones, slope
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—slope, depth to bedrock
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embarkments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Reluctan soil for selected uses and practices

Range seeding: Poor—erodes easily
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embarkments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Sumya soil for selected uses and practices

Range seeding: Poor—large stones
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, too clayey
Pond reservoir areas: Severe—depth to bedrock, slope
Embarkments, dikes, and levees: Severe—thin layer

Interpretive Groups
Capability classification: Roca—VII, nonirrigated; Reluctan—VII, nonirrigated; Sumya—VII, nonirrigated
Range site: Roca—02X028N; Reluctan—02X021N; Sumya—02X052N
Woodland suitability group: Sumya—3R

903—Roca-Burnborough-Rock outcrop association

Map Unit Setting
Position on landscape: Mountains
Elevation: 6,500 to 7,200 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days

Composition

Major components:
- Roca very cobbly loam, 50 to 75 percent slopes—Xerolic Haplargids, clayey-skeletal, montmorillonitic, frigid—40 percent
- Burnborough very gravelly loam, 50 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—25 percent
- Rock outcrop—20 percent

Contrasting inclusions:
- Inclusion 1: Sumya very cobbly loam, 50 to 75 percent slopes—Lithic Xeric Torriorthents, clayey-skeletal, montmorillonitic, nonacid, frigid—8 percent
- Inclusion 2: Cleavage very gravelly loam, 50 to 75 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—7 percent

Characteristics of the Roca Soil

Position on landscape: South- and west-facing mountain slopes
Parent material: Kind—residuum; source—chert, shale, siliceous conglomerate, andesite, rhyolite, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, Wyoming big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail, scattered Utah juniper
Rock fragments on the surface: Kind—cobbles; percentage of surface covered—20

Typical profile

0 to 6 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6
6 to 34 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2
34 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 3.6 to 4.5 inches  
Water-supplying capacity: About 10 inches  
Runoff: Very rapid  
Hydrologic group: D  
Erosion factors (surface layer): K value—10; T value—2; wind erodibility group—8  
Hazard of erosion: By water—moderate; by wind—slight  
Shrink-swell potential: Moderate  
Corrosivity: To steel—moderate; to concrete—low  
Potential for frost action: Low  

**Characteristics of the Burnborough Soil**  
Position on landscape: North- and east-facing side slopes on mountains  
Parent material: Kind—residuum; source—andesite, rhyolite  
Slope features: Length—long; shape—concave  
Dominant present vegetation: Mountain big sagebrush, Idaho fescue, scattered Utah juniper  
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—55  

**Typical profile**  
0 to 13 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 40 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, SM-SC; estimated AASHTO classification—A-2  
13 to 60 inches—very gravelly loam; 15 to 25 percent cobbles and stones and 40 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2  

**Soil and water features**  
Depth to a seasonal high water table: More than 60 inches  
Flooding: None  
Permeability: Moderate  
Available water capacity: 5.1 to 6.9 inches  
Water-supplying capacity: About 10 inches  
Runoff: Rapid  
Hydrologic group: B  
Erosion factors (surface layer): K value—.24; T value—5; wind erodibility group—7  
Hazard of erosion: By water—severe; by wind—slight  
Shrink-swell potential: Moderate  
Corrosivity: To steel—moderate; to concrete—low  
Potential for frost action: Moderate  

**Characteristics of the Rock Outcrop**  
Position on landscape: Scattered small peaks and ridges  
Dominant present vegetation: Barren  

**Contrasting Inclusions**  
Inclusion 1  
Position on landscape: Eroded side slopes on mountains  
Distinctive present vegetation: Utah juniper  
Inclusion 2  
Position on landscape: Convex back slopes of mountains  
Distinctive present vegetation: Low sagebrush  

**Major Uses**  
Current uses: Rangeland, wildlife habitat  

**Wildlife habitat elements**  
Suitability of the Roca soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
Suitability of the Burnborough soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  

**Ratings and restrictive features of the Roca soil for selected uses and practices**  
Range seeding: Poor—large stones  
Daily cover for landfill: Poor—small stones, slope, depth to bedrock  
Shallow excavations: Severe—slope, depth to bedrock  
Local roads and streets: Severe—slope  
Roadfill: Poor—slope, depth to bedrock  
Sand: Improbable source—excess fines  
Gravel: Improbable source—excess fines  
Topsoil: Poor—small stones, slope  
Pond reservoir areas: Severe—slope  
Embankments, dikes, and levees: Severe—thin layer  

**Ratings and restrictive features of the Burnborough soil for selected uses and practices**  
Range seeding: Poor—small stones, erodes easily  
Daily cover for landfill: Poor—small stones, slope  
Shallow excavations: Severe—slope  
Local roads and streets: Severe—slope  
Roadfill: Poor—slope  
Sand: Improbable source—excess fines  
Gravel: Improbable source—excess fines  
Topsoil: Poor—small stones, area reclaim, slope  
Pond reservoir areas: Severe—slope  
Embankments, dikes, and levees: Moderate—large stones
**Interpretive Groups**

**Capability classification**: Roca—VIIIs, nonirrigated; Burnborough—VIIIs, nonirrigated; Rock outcrop—VIIIs

**Range site**: Roca—024X028N; Burnborough—024X021N

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**905—Roca-Reluctan Variant association, steep**

**Map Unit Setting**

**Position on landscape**: Mountain side slopes

**Elevation**: 5,500 to 6,500 feet

**Average annual precipitation**: About 11 inches

**Average annual air temperature**: About 43 degrees F

**Frost-free period**: About 80 days

**Composition**

**Major components:**
- Roca very cobbly loam, 30 to 50 percent slopes—Xerolic Haplargids, clayey-skeletal, montmorillonitic, frigid—55 percent
- Reluctan Variant gravelly silt loam, 30 to 50 percent slopes—Xerolic Haplargids, fine-loamy, mixed, frigid—30 percent

**Contrasting inclusions:**
- Inclusion 1: Xerolic Haplargids cobbly loam, 30 to 50 percent slopes—Xerolic Haplargids, loamy-skeletal, mixed, frigid—6 percent
- Inclusion 2: Durixerolic Camborthids cobbly loam, 8 to 15 percent slopes—Durixerolic Camborthids, coarse-loamy, mixed, mesic—5 percent
- Inclusion 3: Lithic Xerolic Haplargids very cobbly loam, 4 to 15 percent slopes—Lithic Xerolic Haplargids, loamy-skeletal, mixed, frigid—3 percent
- Inclusion 4: Xeric Torriorthents cobbly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, coarse-loamy, mixed, mesic—1 percent

**Characteristics of the Roca Soil**

**Position on landscape**: South-facing side slopes on mountains

**Parent material**: Kind—residuum; source—rhyolite, quartzite

**Slope features**: Length—long; shape—convex

**Dominant present vegetation**: Mountain big sagebrush, Wyoming big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail

**Rock fragments on the surface**: Kind—cobbles; percentage of surface covered—20

**Typical profile**

0 to 6 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6

6 to 34 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

34 inches—unweathered bedrock

**Soil and water features**

**Depth to bedrock**: 20 to 40 inches

**Depth to a seasonal high water table**: More than 60 inches

**Flooding**: None

**Permeability**: Very slow

**Available water capacity**: 3.6 to 4.5 inches

**Water-supplying capacity**: About 10 inches

**Runoff**: Rapid

**Hydrologic group**: D

**Erosion factors (surface layer)**: K value—10; T value—2; wind erodibility group—8

**Hazard of erosion**: By water—moderate; by wind—slight

**Shrink-swell potential**: Moderate

**Corrosivity**: To steel—moderate; to concrete—low

**Potential for frost action**: Low

**Characteristics of the Reluctan Variant Soil**

**Position on landscape**: North- and east-facing side slopes on mountains

**Parent material**: Kind—residuum; source—chert, argillite, shale

**Slope features**: Length—long; shape—concave

**Dominant present vegetation**: Wyoming big sagebrush, Idaho fescue, rabbitbrush

**Rock fragments on the surface**: Kind—gravel, cobbles; percentage of surface covered—27

**Typical profile**

0 to 6 inches—gravelly silt loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL—ML, SM—SC, GM—GC; estimated AASHTO classification—A-4

6 to 34 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated
Unified classification—CL, SC, GC; estimated AASHTO classification—A-6
34 to 60 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2, A-6, A-7

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.1 to 8.1 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (surface layer): K value—.32; T value—1; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex, south-facing shoulder slopes
Distinctive present vegetation: Thurber needlegrass, basin big sagebrush

Inclusion 2
Position on landscape: Convex foot slopes adjacent to fan piedmonts
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Inclusion 3
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Inclusion 4
Position on landscape: Concave foot slopes adjacent to channels
Distinctive present vegetation: Basin big sagebrush, basin wildrye

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Roca soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Reluctan Variant soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Roca soil for selected uses and practices

Range seeding: Poor—large stones
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—slope, depth to bedrock
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Suitability of the Reluctan Variant soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Reluctan Variant soil for selected uses and practices

Range seeding: Poor—erodes easily
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, slope
Pond reservoir areas: Severe—slope
Embarkments, dikes, and levees: Slight

Interpretive Groups

Capability classification: Roca—VII, nonirrigated; Reluctan Variant—VII, nonirrigated
Range site: Roca—024X028N; Reluctan Variant—024X033N

906—Roca-Reluctan Variant association, very steep

Map Unit Setting

Position on landscape: Mountain side slopes
Elevation: 5,800 to 6,500 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days

Composition

Major components:
• Roca very cobbly loam, 30 to 50 percent slopes—
Xerolic Hapluderts, clayey-skeletal, montmorillonitic, frigid—60 percent
• Reluctan Variant gravelly silt loam, 50 to 75 percent
slopes—Xerolic Haplorgids, fine-loamy, mixed, frigid—25 percent
Contrasting inclusions:
• Inclusion 1: Aridic Argixerolls gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—6 percent
• Inclusion 2: Lithic Xerolic Haplorgids very cobbly loam, 4 to 15 percent slopes—Lithic Xerolic Haplorgids, loamy-skeletal, mixed, frigid—5 percent
• Inclusion 3: Lithic Torriorthents very cobbly loam, 30 to 50 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed, nonacid, frigid—3 percent
• Inclusion 4: Xeric Torriorthents very cobbly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, coarse-loamy, mixed, mesic—1 percent

Characteristics of the Roca Soil
Position on landscape: South- and west-facing side slopes on mountains
Parent material: Kind—residuum; source—chert, argillite, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, Wyoming big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—cobbles; percentage of surface covered—20

Typical profile
0 to 6 inches—very cobbly loam; 50 to 60 percent cobbles and stones and 15 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-6
6 to 34 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); angular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2
34 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.1 to 8.1 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid

Hydrologic group: D
Erosion factors (surface layer): K value—0.10; T value—
2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

Characteristics of the Reluctant Variant Soil
Position on landscape: North- and east-facing side slopes on mountains
Parent material: Kind—residuum; source—chert, argillite, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, Idaho fescue
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—27

Typical profile
0 to 6 inches—gravelly silt loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, SM-SC, GM-GC; estimated AASHTO classification—A-4
6 to 34 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable, neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, SC, GC; estimated AASHTO classification—A-6
34 to 60 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2, A-6, A-7

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.1 to 8.1 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid

Hydrologic group: B
Erosion factors (surface layer): K value—0.32; T value—1; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Concave, north-facing side slopes on mountains
Distinctive present vegetation: Snowberry

Inclusion 2
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Bluebunch wheatgrass, Wyoming big sagebrush

Inclusion 3
Position on landscape: All aspects of eroded side slopes on mountains
Distinctive present vegetation: Utah juniper

Inclusion 4
Position on landscape: Concave toe slopes adjacent to channels
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements
Suitability of the Roca soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Reluctant Variant soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Roca soil for selected uses and practices
Range seeding: Poor—large stones
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—slope, depth to bedrock
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Reluctant Variant soil for selected uses and practices
Range seeding: Poor—erodes easily
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Slight

Interpretive Groups
Capability classification: Roca—VIIa, nonirrigated; Reluctant Variant—VIIe, nonirrigated
Range site: Roca—024X028N; Reluctant Variant—024X033N

911—Tenabo-Daick-Oxcorel association

Map Unit Setting
Position on landscape: Fan piedmonts, hills
Elevation: 4,500 to 5,000 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition
Major components:
- Tenabo cobbly very fine sandy loam, 2 to 8 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—45 percent
- Daick stony clay loam, 30 to 50 percent slopes—Typic Torriorthents, clayey, montmorillonitic (calcareous), mesic, shallow—20 percent
- Oxcorel gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natragids, fine, montmorillonitic, mesic—20 percent
Contrasting inclusions:
- Inclusion 1: Cleaver gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—7 percent
- Inclusion 2: Typic Natragids gravelly very fine sandy loam, 30 to 50 percent slopes—Typic Natragids, fine-loamy, mixed, mesic—5 percent
- Inclusion 3: Orovada very fine sandy loam, 2 to 8 percent slopes—Durixerollic Camborthids, coarse-loamy, mixed, mesic—3 percent

Characteristics of the Tenabo Soil
Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—20
Typical profile

0 to 5 inches—cobbly very fine sandy loam; 25 to 40 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 17 inches—clay loam; 5 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-6

17 to 24 inches—indurated layer; massive; extremely hard, extremely firm

24 to 60 inches—extremely gravelly sandy loam; 5 to 25 percent cobbles and stones and 70 to 80 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 9 to 20 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Above the duripan—moderate

Available water capacity: 3.2 to 3.5 inches

Water-supplying capacity: About 6 inches

Runoff: Medium

Hydrologic group: D

Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—7

Hazard of erosion: By water—severe; by wind—slight

Shrink-swell potential: Moderate

Corrosivity: To steel—high; to concrete—moderate

Potential for frost action: Low

Characteristics of the Oxicore Soil

Position on landscape: Fan piedmont remnants

Parent material: Mixed alluvium somewhat influenced by loess

Slope features: Length—long; shape—slightly convex

Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, Sandberg bluegrass

Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—24

Typical profile

0 to 8 inches—gravely very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

8 to 34 inches—clay loam; 0 to 5 percent cobbles and stones and 10 to 20 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

34 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to
Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 6.1 to 8.0 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value=.28; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Fan piedmont remnants
Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

Inclusion 2
Position on landscape: Convex hillsides
Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

Inclusion 3
Position on landscape: Narrow drainageways on fan piedmont remnants
Distinctive present vegetation: Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Tenabo soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Daick soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Oxcorel soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Tenabo soil for selected uses and practices

Range seeding: Poor—too arid, large stones, excess sodium

Daily cover for landfill: Poor—cemented pan, seepage, too sandy
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan
Roadfill: Poor—cemented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—cemented pan, small stones, too sandy
Pond reservoir areas: Severe—seepage, cemented pan
Embankments, dikes, and levees: Severe—seepage, excess sodium, excess salt
Drainage: Deep to water
Irrigation: Cemented pan, slope, erodes easily
Terraces and diversions: Large stones, cemented pan

Ratings and restrictive features of the Daick soil for selected uses and practices

Range seeding: Poor—too arid, droughty, large stones
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Oxcorel soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, excess sodium, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium
Drainage: Deep to water
Irrigation: Percs slowly, slope, excess sodium, slope
Terraces and diversions: Favorable

Interpretive Groups

Capability classification: Tenabo—IVs, irrigated, and VIIs, nonirrigated; Daick—VIIIs, nonirrigated; Oxcorel—I Ve, irrigated, and VIIs, nonirrigated
Range site: Tenabo—024X002N; Daick—027X027N; Oxcorel—024X002N
930—Bubus-Benin-Wendane association

Map Unit Setting

Position on landscape: Alluvial flats, lake plains
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

Composition

Major components:
• Bubus very fine sandy loam, 0 to 2 percent slopes—Durorithic Torrithents, coarse-loamy, mixed (calcareous), mesic—45 percent
• Benin silt loam, 0 to 2 percent slopes—Typic Torrithents, fine, montmorillonitic (calcaceous), mesic—25 percent
• Wendane silt loam, drained, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—20 percent

Contrasting inclusions:
• Inclusion 1: Misad gravelly very fine sandy loam, 0 to 2 percent slopes—Durorithic Torriothents, loamy-skeletal, mixed (calcaceous), mesic—5 percent
• Inclusion 2: Batan silt loam, 0 to 2 percent slopes—Durorithic Torriothents, fine-silty, mixed (calcareous), mesic—4 percent
• Inclusion 3: Cumulic Haplaquolls silt loam, 0 to 2 percent slopes—Cumulic Haplaquolls, fine-silty, mixed, mesic—1 percent

Characteristics of the Bubus Soil

Position on landscape: Alluvial flat remnants
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, black greasewood
Rock fragments on the surface: Kind—gravel; percentage of surface covered—2

Typical profile

0 to 13 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML; estimated AASHTO classification—A-4
13 to 60 inches—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic or strongly sodic (SAR more than 23); estimated Unified classification—ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 9.0 to 10.2 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.49; T value—.5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Benin Soil

Position on landscape: Lake plain terraces
Parent material: Loess over lacustrine sediments
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, black greasewood
Rock fragments on the surface: Kind—gravel; percentage of surface covered—2

Typical profile

0 to 9 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; CL-ML; estimated AASHTO classification—A-4
9 to 60 inches—clay; prismatic structure; hard, firm; strongly alkaline (pH 9.0); slightly saline or moderately saline (4 to 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, CH, MH; estimated AASHTO classification—A-7

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: Rare
Permeability: Very slow
Available water capacity: 8.7 to 9.9 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: D
Erosion factors (surface layer): K value—.49; T value—.5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low
Characteristics of the Wendane Soil

Position on landscape: Alluvial flats
Parent material: Loess over mixed sediments
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Torrey quailbush, black greasewood

Typical profile
0 to 11 inches—silt loam; platy structure; slightly hard, friable; very strongly alkaline (pH 9.4); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
11 to 60 inches—silt loam; massive; slightly hard, firm; very strongly alkaline (pH 9.2); slightly saline or moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: Frequency—occasional; duration—brief; months—December through May
Permeability: Moderately slow
Available water capacity: 10.2 to 12.0 inches
Water-supplying capacity: About 15 inches
Runoff: Ponded
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly convex alluvial flats bordering fan skirts
Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

Inclusion 2
Position on landscape: Slightly convex lake plain terraces
Distinctive present vegetation: Bottlebrush squirreltail, shadscale

Inclusion 3
Position on landscape: Slightly concave alluvial flats
Distinctive present vegetation: Silver buffaloberry

Wildlife habitat elements

Suitability of the Bubus soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Benin soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Wendane soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Bubus soil for selected uses and practices
Range seeding: Poor—too arid, excess salt, too crusty
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Drainage: Deep to water
Irrigation: Erodes easily, excess salt
Terraces and diversions: Erodes easily

Ratings and restrictive features of the Benin soil for selected uses and practices
Range seeding: Poor—too arid, excess salt, too crusty
Daily cover for landfill: Poor—hard to pack
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Poor—low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, too clayey
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—hard to pack
Drainage: Deep to water
Irrigation: Erodes easily, excess salt, percs slowly
Terraces and diversions: Percs slowly, erodes easily

Ratings and restrictive features of the Wendane soil for selected uses and practices
Range seeding: Poor—excess salt, excess sodium, too crusty
Daily cover for landfill: Poor—excess sodium

Major Uses
Current uses: Rangeland, wildlife habitat
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Roadfill: Fair—low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping, excess salt, excess sodium

**Interpretive Groups**

*Capability classification:* Bubus—IIs, irrigated, and Vlls, nonirrigated; Benin—IVs, irrigated, and Vlls, nonirrigated; Wendan—Vlls, nonirrigated

*Range site:* Bubus—024X003N; Benin—024X003N; Wendan—024X015N

**931—Bubus-Valmy association**

**Map Unit Setting**

*Position on landscape:* Basin floors
*Elevation:* 4,000 to 4,500 feet
*Average annual precipitation:* About 7 inches
*Average annual air temperature:* About 49 degrees F
*Frost-free period:* About 110 days

**Composition**

*Major components:*
- Bubus very fine sandy loam, 0 to 2 percent slopes—Durothidic Torriorthents, coarse-loamy, mixed (calcereous), mesic—60 percent
- Valmy loamy fine sand, loamy substratum, 2 to 8 percent slopes—Durothidic Torriorthents, coarse-loamy, mixed (calcereous), mesic—25 percent

*Contrasting inclusions:*
- Inclusion 1: Weso very fine sandy loam, 0 to 2 percent slopes—Durcamborthids, coarse-loamy, mixed, mesic—7 percent
- Inclusion 2: Benin silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine, montmorillonitic (calcereous), mesic—4 percent
- Inclusion 3: Aerlic Halaquepts silt loam, 0 to 2 percent slopes—Aerlic Halaquepts, coarse-silty, mixed (calcereous), mesic—2 percent
- Inclusion 4: Dun Glen silt loam, frequently flooded, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—2 percent

**Characteristics of the Bubus Soil**

*Position on landscape:* Lake plain terraces
*Parent material:* Loess over mixed alluvium and lacustrine sediments
*Slope features:* Length—long; shape—slightly convex

**Dominant present vegetation:** Shadscale, black grassewood, bud sagebrush
**Rock fragments on the surface:** Kind—gravel; percentage of surface covered—2

**Typical profile**

0 to 13 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 60 inches—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic or strongly sodic (SAR more than 23); estimated Unified classification—ML; estimated AASHTO classification—A-4

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Moderate
*Available water capacity:* 9.0 to 10.2 inches
*Water-supplying capacity:* About 6 inches
*Runoff:* Very slow
*Hydrologic group:* B
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* Low
*Corrosivity:* To steel—high; to concrete—high
*Potential for frost action:* Low

**Characteristics of the Valmy Soil**

*Position on landscape:* Remnants of inset fans
*Parent material:* Loess over mixed alluvium and lacustrine sediments
*Slope features:* Length—long; shape—slightly concave

**Dominant present vegetation:** Black grassewood, basin big sagebrush, basin wildrye

**Rock fragments on the surface:** Kind—gravel; percentage of surface covered—10

**Typical profile**

0 to 3 inches—loamy fine sand; 0 to 10 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.0); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 to 60 inches—stratified very fine sandy loam to
gravelly coarse sandy loam; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2, A-4

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 9.0 to 10.2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions**

**Inclusion 1**  
*Position on landscape:* Slightly convex lake plain terraces adjacent to fan skirts  
*Distinctive present vegetation:* Bottlebrush squirreltail, shadscale, bud sagebrush

**Inclusion 2**  
*Position on landscape:* Slightly concave lagoons  
*Distinctive present vegetation:* Bottlebrush squirreltail, shadscale, black greasewood

**Inclusion 3**  
*Position on landscape:* Slightly concave lake plain terraces adjacent to playas  
*Distinctive present vegetation:*Torrey quailbush

**Inclusion 4**  
*Position on landscape:* Slightly concave lagoons behind offshore bars  
*Distinctive present vegetation:* Winterfat

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Bubus soil for named elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Suitability of the Valmy soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings and restrictive features of the Bubus soil for selected uses and practices**

*Range seeding:* Poor—too arid, excess salt, too crusty  
*Daily cover for landfill:* Good  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—excess salt  
*Pond reservoir areas:* Moderate—seepage  
*Embankments, dikes, and levees:* Severe—piping, excess salt  
*Drainage:* Deep to water  
*Irrigation:* Erodes easily, excess salt  
*Terraces and diversions:* Erodes easily

**Ratings and restrictive features of the Valmy soil for selected uses and practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Daily cover for landfill:* Fair—small stones  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones  
*Pond reservoir areas:* Severe—seepage  
*Embankments, dikes, and levees:* Moderate—seepage, piping  
*Drainage:* Deep to water  
*Irrigation:* Droughty, slope, soil blowing  
*Terraces and diversions:* Soil blowing

**Interpretive Groups**

*Capability classification:* Bubus—Ils, irrigated, and VIIIs, nonirrigated; Valmy—Ille, irrigated, and VIIIs, nonirrigated  
*Range site:* Bubus—024X003N; Valmy—024X022N

**932—Bubus very fine sandy loam, 0 to 2 percent slopes**

**Map Unit Setting**

*Position on landscape:* Lake plain terraces  
*Elevation:* 4,000 to 4,200 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free period:* About 110 days
Composition

Major component:
- Bubus very fine sandy loam, 0 to 2 percent slopes—Durothcid Torriothents, coarse-loamy, mixed (calcaceous), mesic—90 percent

Contrasting inclusions:
- Inclusion 1: Valmy fine sandy loam, 0 to 2 percent slopes—Durothcid Torriothents, coarse-loamy, mixed (calcaceous), mesic—5 percent
- Inclusion 2: Tropich Torriothents silt loam, 0 to 2 percent slopes—Tropich Torriothents, coarse-loamy, mixed (calcaceous), mesic—3 percent
- Inclusion 3: Typic Torriothents fine sand, 0 to 2 percent slopes—Tropich Torriothents, mixed, mesic—2 percent

Characteristics of the Bubus Soil

Position on landscape: Lake plain terraces
Parent material: Loess over mixed alluvium high in content of pyroclastic material
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, black greasewood, bud sagebrush
Rock fragments on the surface: Kind—gravel; percentage of surface covered—2

Typical profile
0 to 13 inches—very fine sandy loam; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML; estimated AASHTO classification—A-4
13 to 60 inches—stratified sandy loam to silt loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); strongly sodic (SAR more than 23); estimated Unified classification—ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 9.0 to 10.2 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—0.49; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high

Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly concave lake plain terraces
Distinctive present vegetation: Basin wildrye, black greasewood, big sagebrush

Inclusion 2
Position on landscape: Slightly concave lake plain terraces adjacent to playas
Distinctive present vegetation: Basin wildrye

Inclusion 3
Position on landscape: Sand dunes
Distinctive present vegetation: Fourwing saltbush, Nevada dalea

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Bubus soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Bubus soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, too crusty
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Drainage: Deep to water
Irrigation: Erodes easily, excess salt
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: IIs, irrigated, and VIIis, nonirrigated
Range site: 024X003N

950—Puffer, very steep-Xine-Puffer association

Map Unit Setting

Position on landscape: Mountains
Elevation: 5,500 to 6,500 feet  
Average annual precipitation: About 11 inches  
Average annual air temperature: About 44 degrees F  
Frost-free period: About 100 days

**Composition**

Major components:
- Puffer very cobby loam, 50 to 75 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—45 percent
- Xine gravelly loam, 30 to 50 percent slopes—Aridic Calcixerolls, loamy-skeletal, mixed, frigid—25 percent
- Puffer very cobby loam, 4 to 15 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—15 percent

Contrasting inclusions:
- Inclusion 1: Typic Haplargids very cobby loam, 30 to 50 percent slopes—Typic Haplargids, loamy-skeletal, mixed, mesic—7 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Mulhop very cobby loam, 30 to 50 percent slopes—Lithic Xerolic Calcorthods, loamy-skeletal, mixed, frigid—2 percent
- Inclusion 4: Xeric Torriorthents loam, 2 to 8 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—1 percent

**Characteristics of the Very Steep Puffer Soil**

Position on landscape: South- and west-facing side slopes of mountains  
Parent material: Kind—residuum; source—limestone, shale  
Slope features: Length—long; shape—concave  
Dominant present vegetation: Black sagebrush, Sandberg bluegrass  
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—31

**Typical profile**

0 to 2 inches—very cobby loam; 25 to 40 percent cobbles and stones and 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

2 to 11 inches—very gravelly loam; 15 to 40 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GC, GM-GC; estimated AASHTO classification—A-2

11 to 12 inches—weathered bedrock

12 inches—unweathered bedrock

**Soil and water features**

Depth to bedrock: 4 to 11 inches  
Depth to a seasonal high water table: More than 60 inches  
Flooding: None  
Permeability: Moderately rapid  
Available water capacity: 0.6 inch to 1.1 inches  
Water-supplying capacity: About 8 inches  
Runoff: Very rapid  
Hydrologic group: D  
Erosion factors (surface layer): K value—.20; T value—1; wind erodibility group—7  
Hazard of erosion: By water—severe; by wind—slight  
Shrink-swell potential: Low  
Corrosivity: To steel—high; to concrete—low  
Potential for frost action: Moderate

**Characteristics of the Xine Soil**

Position on landscape: North- and east-facing side slopes of mountains  
Parent material: Kind—residuum; source—limestone, shale  
Slope features: Length—long; shape—concave  
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue  
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—31

**Typical profile**

0 to 10 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

10 to 38 inches—very cobby loam; 35 to 50 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2, A-4

38 inches—weathered bedrock

**Soil and water features**

Depth to bedrock: 20 to 40 inches  
Depth to a seasonal high water table: More than 60 inches  
Flooding: None  
Permeability: Moderately rapid  
Available water capacity: 3.0 to 4.1 inches
Water-supplying capacity: About 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—0.24; T value—2; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Less Sloping Puffer Soil
Position on landscape: South- and west-facing side slopes of mountains
Parent material: Kind—residuum; source—limestone, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—60
Typical profile
0 to 2 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
2 to 11 inches—very gravelly loam; 15 to 40 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GC, GM-GC; estimated AASHTO classification—A-2
11 to 12 inches—weathered bedrock
12 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 4 to 11 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 0.6 inch to 1.1 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—20; T value—1; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: South-facing foot slopes
Distinctive present vegetation: Shadscale

Inclusion 2
Position on landscape: Ridgetops
Distinctive present vegetation: Barren

Inclusion 3
Position on landscape: Eroded mountainsides
Distinctive present vegetation: Utah juniper

Inclusion 4
Position on landscape: Stream channels on mountainsides
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the very steep Puffer soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Xine soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the less sloping Puffer soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the very steep Puffer soil for selected uses and practices

Range seeding: Poor—droughty, small stones, large stones
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope

Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Xine soil for selected uses and practices

Range seeding: Poor—eroses easily
Daily cover for landfill: Poor—large stones, slope, depth to bedrock
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the less sloping
Puffer soil for selected uses and practices
Range seeding: Poor—droughty, small stones, large stones
Daily cover for landfill: Poor—depth to bedrock
Shallow excavations: Severe—depth to bedrock
Local roads and streets: Severe—depth to bedrock
Roadfill: Poor—depth to bedrock, small stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones
Pond reservoir areas: Severe—slope, depth to bedrock
Embarkments, dikes, and levees: Severe—large stones

Interpretive Groups
Capability classification: Puffer, very steep—VII, nonirrigated; Xine—VII, nonirrigated; the less sloping Puffer—VII, nonirrigated
Range site: Puffer, very steep—024X030N; Xine—024X021N; the less sloping Puffer—024X030N

953—Puffer-Bojo-Rock outcrop association

Map Unit Setting
Position on landscape: Mountain side slopes
Elevation: 4,500 to 6,000 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days

Composition
Major components:
• Puffer very cobby loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—40 percent
• Bojo very cobby loam, 30 to 50 percent slopes—Lithic Hapludands, loamy, mixed, mesic—30 percent
• Rock outcrop—15 percent
Contrasting inclusions:
• Inclusion 1: Typic Torriorthents very cobby loam, 30 to 50 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic, shallow—10 percent
• Inclusion 2: Bojo very cobby loam, 4 to 15 percent slopes—Lithic Hapludands, loamy, mixed, mesic—5 percent

Characteristics of the Puffer Soil
Position on landscape: Shoulder slopes and back slopes of mountains

Parent material: Kind—residuum; source—limestone, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—60

Typical profile
0 to 2 inches—very cobby loam; 25 to 40 percent cobbles and stones and 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
2 to 11 inches—very gravelly loam; 15 to 40 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GC, GM-GC; estimated AASHTO classification—A-2
11 to 12 inches—weathered bedrock
12 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 4 to 11 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 0.6 inch to 1.1 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.20; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Bojo Soil
Position on landscape: Back slopes of mountains
Parent material: Kind—residuum; source—mixed metamorphic and volcanic rocks
Slope features: Length—long; shape—concave
Dominant present vegetation: Wyoming big sagebrush, shadscale, Sandberg bluegrass, rabbitbrush
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—45

Typical profile
0 to 3 inches—very cobby loam; 30 to 50 percent
cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, very friable; 
moderately alkaline (pH 8.4); nonsaline (less than 4 
mmhos/cm); nonsodic (SAR less than 13); 
estimated Unified classification—GM-GC; estimated 
AASHTO classification—A-2, A-4 
3 to 10 inches—gravely clay loam; 0 to 10 percent 
cobbles and stones and 25 to 35 percent pebbles 
(by weight); subangular blocky structure; hard, firm; 
moderately alkaline (pH 8.4); nonsaline (less than 4 
mmhos/cm); nonsodic (SAR less than 13); 
estimated Unified classification—GC, CL; estimated 
AASHTO classification—A-6 
10 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 5 to 14 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.3 to 1.7 inches
Water-supplying capacity: About 4 to 6 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Rock Outcrop

Position on landscape: Scattered small peaks and ridges on mountains
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex shoulder slopes of mountains
Distinctive present vegetation: Wyoming big sagebrush, shadscale, bluegrass

Inclusion 2
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Wyoming big sagebrush, shadscale

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Puffer soil for named elements: Wild 
herbaceous plants (nonirrigated)—poor; shrubs 
(nonirrigated)—poor

Suitability of the Bojo soil for named elements: Wild 
herbaceous plants (nonirrigated)—poor; shrubs 
(nonirrigated)—poor

Ratings and restrictive features of the Puffer soil for 
selected uses and practices

Range seeding: Poor—droughty, small stones, erodes easily
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope

Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Bojo soil for 
selected uses and practices

Range seeding: Poor—droughty, small stones, too arid
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope

Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Puffer—VII*, nonirrigated; 
Bojo—VII*, nonirrigated; Rock outcrop—VII*
Range site: Puffer—024X030N; Bojo—024X026N

954—Puffer-Xine-Rock outcrop association

Map Unit Setting

Position on landscape: Mountain side slopes
Elevation: 5,500 to 6,500 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 44 degrees F
Frost-free period: About 100 days

Composition

Major components:
- Puffer very cobbly loam, 50 to 75 percent slopes— 
  Lithic Xeric Torriorthents, loamy-skeletal, mixed 
  (calcareous), mesic—40 percent
- Xine gravelly silt loam, 50 to 75 percent slopes—Aridic 
  Calcixerolls, loamy-skeletal, mixed, frigid—25 percent
• Rock outcrop—20 percent
  Contrasting inclusions:
  • Inclusion 1: Linrose gravelly loam, 50 to 75 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—8 percent
  • Inclusion 2: Mulhop very cobbly loam, 50 to 75 percent slopes—Lithic Xerollic Calcorthods, loamy-skeletal, mixed, frigid—7 percent

  **Characteristics of the Puffer Soil**

  Position on landscape: South- and west-facing mountainsides
  Parent material: Kind—residuum; source—limestone, shale
  Slope features: Length—long; shape—convex
  Dominant present vegetation: Black sagebrush, Sandberg bluegrass, scattered Utah juniper
  Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—60

  **Typical profile**

  0 to 2 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
  2 to 11 inches—very gravelly loam; 15 to 40 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GC, GM-GC; estimated AASHTO classification—A-4
  11 to 12 inches—weathered bedrock
  12 inches—unweathered bedrock

  **Soil and water features**

  Depth to bedrock: 4 to 11 inches
  Depth to a seasonal high water table: More than 60 inches
  Flooding: None
  Permeability: Moderately rapid
  Available water capacity: 0.6 inch to 1.1 inches
  Water-supplying capacity: About 8 inches
  Runoff: Very rapid
  Hydrologic group: D
  Erosion factors (surface layer): K value—20; T value—1; wind erodibility group—7
  Hazard of erosion: By water—severe; by wind—slight
  Shrink-swell potential: Low
  Corrosivity: To steel—high; to concrete—low
  Potential for frost action: Moderate

  **Characteristics of the Xine Soil**

  Position on landscape: North- and east-facing side slopes on mountains
  Parent material: Kind—residuum; source—limestone, shale
  Slope features: Length—long; shape—convex
  Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue, scattered Utah juniper
  Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—31

  **Typical profile**

  0 to 10 inches—gravelly silt loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
  10 to 38 inches—very cobbly loam; 35 to 50 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4, A-1
  38 inches—weathered bedrock

  **Soil and water features**

  Depth to bedrock: 20 to 40 inches
  Depth to a seasonal high water table: More than 60 inches
  Flooding: None
  Permeability: Moderately rapid
  Available water capacity: 3.0 to 4.1 inches
  Water-supplying capacity: About 11 inches
  Runoff: Rapid
  Hydrologic group: C
  Erosion factors (surface layer): K value—.24; T value—2; wind erodibility group—6
  Hazard of erosion: By water—severe; by wind—slight
  Shrink-swell potential: Low
  Corrosivity: To steel—high; to concrete—low
  Potential for frost action: Moderate

  **Characteristics of the Rock Outcrop**

  Position on landscape: Scattered areas on side slopes of mountains
  Dominant present vegetation: Barren

  **Contrasting Inclusions**

  Inclusion 1
  Position on landscape: Convex, north-facing shoulder slopes of mountains
Distinctive present vegetation: Cusick bluegrass, Idaho fescue, black sagebrush

Inclusion 2
Position on landscape: Convex, south-facing shoulder slopes of mountains
Distinctive present vegetation: Utah juniper

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Puffer soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Xine soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Puffer soil for selected uses and practices

Range seeding: Poor—droughty, small stones, slope, erodes easily
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Xine soil for selected uses and practices

Range seeding: Poor—erodes easily
Daily cover for landfill: Poor—large stones, slope, depth to bedrock
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—large stones

Interpretive Groups
Classification: Puffer—Vlls, nonirrigated;
Xine—Vlle, nonirrigated; Rock outcrop—Vlls
Range site: Puffer—024X030N; Xine—024X021N

955—Puffer-Mulhop-Rock outcrop association

Map Unit Setting
Position on landscape: Mountain side slopes
Elevation: 5,500 to 6,500 feet
Average annual precipitation: About 10 inches
Average annual air temperature: About 45 degrees F
Frost-free period: About 85 days

Composition

Major components:
• Puffer very cobbly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—45 percent
• Mulhop very gravelly loam, 30 to 50 percent slopes—Lithic Xerolic Calcixerolls, loamy-skeletal, mixed, frigid—20 percent
• Rock outcrop—20 percent

Contrasting inclusions:
• Inclusion 1: Xeric Torriorthents loam, rarely flooded, 4 to 15 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), frigid—5 percent
• Inclusion 2: Xine gravelly silt loam, 30 to 50 percent slopes—Aridic Calcixerolls, loamy-skeletal, mixed, frigid—5 percent
• Inclusion 3: Eastwell very gravelly loam, 4 to 15 percent slopes—Haploxerolic Durorthids, loamy-skeletal, mixed, mesic, shallow—5 percent

Characteristics of the Puffer Soil

Position on landscape: Back slopes and foot slopes of mountains
Parent material: Kind—residuum; source—limestone, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—60

Typical profile

0 to 2 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

2 to 11 inches—very gravelly loam; 15 to 40 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately
alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GC, GM-GC; estimated AASHTO classification—A-2
11 to 12 inches—weathered bedrock
12 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 4 to 11 inches
*Depth to a seasonal high water table:* More than 60 inches

**Flooding:** None
**Permeability:** Moderately rapid
**Available water capacity:** 0.6 inch to 1.1 inches
**Water-supplying capacity:** About 8 inches
**Runoff:** Rapid
**Hydrologic group:** D
**Erosion factors (surface layer):** K value—.20; T value—1; wind erodibility group—7
**Hazard of erosion:** By water—severe; by wind—slight
**Shrink-swell potential:** Low
**Corrosivity:** To steel—high; to concrete—low
**Potential for frost action:** Moderate

**Characteristics of the Mulhop Soil**

*Position on landscape:* Shoulder slopes and back slopes of mountains
*Parent material:* Kind—residuum; source—limestone
*Slope features:* Length—long; shape—convex
*Dominant present vegetation:* Utah juniper
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—55

**Typical profile**

0 to 6 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
6 to 17 inches—very gravelly loam; 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2, A-4, A-6
17 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 14 to 20 inches
*Depth to a seasonal high water table:* More than 60 inches

**Flooding:** None
**Permeability:** Moderate
**Available water capacity:** 1.5 to 2.0 inches
**Water-supplying capacity:** About 8 inches
**Runoff:** Rapid
**Hydrologic group:** D
**Erosion factors (surface layer):** K value—.17; T value—1; wind erodibility group—7
**Hazard of erosion:** By water—severe; by wind—slight
**Shrink-swell potential:** Low
**Corrosivity:** To steel—high; to concrete—low
**Potential for frost action:** Moderate

**Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges on mountains
*Dominant present vegetation:* Barren

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* Concave toe slopes adjacent to channels
*Distinctive present vegetation:* Basin big sagebrush, basin wildrye

**Inclusion 2**
*Position on landscape:* Concave pockets on north-facing side slopes of mountains
*Distinctive present vegetation:* Mountain big sagebrush, Idaho fescue

**Inclusion 3**
*Position on landscape:* Convex toe slopes of mountains
*Distinctive present vegetation:* Indian ricegrass, black sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat
**Foreseeable uses:** Rangeland, wildlife habitat, woodland

**Ratings of the Mulhop soil for use as woodland**

*Site index for common trees:* Utah juniper—20
*Most important native understory plants:* Black sagebrush, bottlebrush squirreltail, Sandberg bluegrass, basin wildrye

**Wildlife habitat elements**

**Suitability of the Puffer soil for named elements:** Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
**Suitability of the Mulhop soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—poor; coniferous plants (nonirrigated)—fair
Ratings and restrictive features of the Puffer soil for selected uses and practices

Range seeding: Poor—droughty, small stones, erodes easily
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Mulhop soil for selected uses and practices

Range seeding: Poor—small stones, droughty, erodes easily
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Puffer—VII, nonirrigated; Mulhop—VII, nonirrigated; Rock outcrop—VII
Range site: Puffer—024X030N; Mulhop—024X075N
Woodland suitability group: Mulhop—3R

956—Puffer-Linrose-Iver association

Map Unit Setting

Position on landscape: Mountains
Elevation: 5,500 to 6,500 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 45 degrees F
Frost-free period: About 90 days

Composition

Major components:
• Puffer very cobbly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—45 percent
• Linrose very gravelly loam, 50 to 75 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—20 percent
• Iver gravelly silt loam, 50 to 75 percent slopes—Pachic Haploxerolls, coarse-loamy, mixed, frigid—20 percent

Contrasting inclusions:
• Inclusion 1: Cleavage very gravelly loam, 30 to 50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
• Inclusion 2: Mulhop very cobbly loam, 30 to 50 percent slopes—Lithic Xerollic Calciorthids, loamy-skeletal, mixed, frigid—4 percent
• Inclusion 3: Sumine very cobbly loam, 30 to 50 percent slopes—Aridic Xerollolls, loamy-skeletal, mixed, frigid—3 percent
• Inclusion 4: Rock outcrop—3 percent

Characteristics of the Puffer Soil

Position on landscape: South- and west-facing side slopes on mountains
Parent material: Kind—residuum; source—limestone, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—60

Typical profile

0 to 2 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
2 to 11 inches—very gravelly loam; 15 to 40 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GC, GM-GC; estimated AASHTO classification—A-2
11 to 12 inches—weathered bedrock
12 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 4 to 11 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 0.6 inch to 1.1 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.20; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Linrose Soil
Position on landscape: North- and east-facing side slopes on mountains
Parent material: Kind—residuum; source—shale, chert
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, Idaho fescue
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—51

Typical profile
0 to 10 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2, A-4
10 to 23 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2
23 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 2.0 to 3.4 inches
Water-supplying capacity: About 10 inches
Runoff: Very rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.17; T value—2; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Iver Soil
Position on landscape: North-facing side slopes on mountains
Parent material: Kind—residuum; source—sandstone, shale
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, Idaho fescue
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—25

Typical profile
0 to 4 inches—gravelly silt loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, ML; estimated AASHTO classification—A-4
4 to 20 inches—silt loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
20 to 31 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4
31 to 60 inches—very cobbly loam; 45 to 55 percent cobbles and stones and 15 to 50 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC, CL-ML; estimated AASHTO classification—A-2, A-4

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 7.6 to 8.7 inches
Water-supplying capacity: About 12 inches
Runoff: Very rapid
Hydrologic group: B
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions
Inclusion 1
Position on landscape: Convex, north-facing side slopes on mountains
Distinctive present vegetation: Low sagebrush
Inclusion 2
*Position on landscape:* Eroded side slopes on mountains
*Distinctive present vegetation:* Utah juniper

Inclusion 3
*Position on landscape:* Concave, south-facing side slopes on mountains
*Distinctive present vegetation:* Oceanspray

Inclusion 4
*Position on landscape:* The tops and side slopes of mountains

**Other minor inclusions**
- Areas in drainageways that support basin wildrye and basin big sagebrush

**Major Uses**

**Current uses:** Wildlife habitat, rangeland

**Wildlife habitat elements**

*Suitability of the Puffer soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
*Suitability of the Linrose soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the Puffer soil for selected uses and practices**

*Range seeding:* Poor—droughty, small stones, erodes easily
*Daily cover for landfill:* Poor—slope, depth to bedrock
*Shallow excavations:* Severe—depth to bedrock, slope
*Local roads and streets:* Severe—depth to bedrock, slope
*Roadfill:* Poor—slope, depth to bedrock
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—small stones, slope

**Ratings and restrictive features of the Linrose soil for selected uses and practices**

*Range seeding:* Poor—small stones, erodes easily
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope
*Shallow excavations:* Severe—depth to bedrock, slope
*Local roads and streets:* Severe—slope
*Roadfill:* Poor—depth to bedrock, slope
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—small stones, slope
*Pond reservoir areas:* Severe—slope

**Embankments, dikes, and levees:** Severe—thin layer

**Ratings and restrictive features of the Linrose soil for selected uses and practices**

*Range seeding:* Poor—erodes easily
*Daily cover for landfill:* Poor—slope, large stones
*Shallow excavations:* Severe—slope
*Local roads and streets:* Severe—slope
*Roadfill:* Poor—slope
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—area reclaim, small stones, slope
*Pond reservoir areas:* Severe—seepage, slope

**Embankments, dikes, and levees:** Severe—piping

**Interpretive Groups**

*Capability classification:* Puffer—VII, nonirrigated; Linrose—VIII, nonirrigated; Iver—VIII, nonirrigated

*Range site:* Puffer—024X030N; Linrose—024X042N; Iver—024X023N

**957—Puffer, very steep-Atlow-Puffer association**

**Map Unit Setting**

*Position on landscape:* Mountains
*Elevation:* 5,400 to 6,200 feet
*Average annual precipitation:* About 8 inches
*Average annual air temperature:* About 48 degrees F
*Frost-free period:* About 120 days

**Composition**

**Major components:**
- Puffer very flaggy loam, 50 to 75 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—40 percent
- Atlow very flaggy loam, 30 to 50 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—30 percent
- Puffer very flaggy loam, 15 to 30 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—15 percent

**Contrasting inclusions:**
- Inclusion 1: Lithic Torriorthents very channery loam, 50 to 75 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 2: Xerollic Cambhords channery loam, 2 to 8 percent slopes—Xerollic Cambhords, loamy-skeletal, mixed, mesic—4 percent
- Inclusion 3: Xerollic Haplargids very channery loam, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, mesic—3 percent
- Inclusion 4: Typic Cambhords channery loam, 2 to 8
percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—3 percent

**Characteristics of the very steep Puffer Soil**

**Position on landscape:** North- and east-facing side slopes of mountains

**Parent material:** Kind—residuum; source—shale, limestone

**Slope features:** Length—long; shape—plane to convex

**Dominant present vegetation:** Black sagebrush, shadscale, ephedra, bottlebrush squirreltail, pine bluegrass

**Rock fragments on the surface:** Kind—channers, flagstones; percentage of surface covered—45

**Typical profile**

0 to 4 inches—very flaggy loam; 25 to 40 percent cobbles and stones and 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

4 to 11 inches—very gravelly loam; 15 to 40 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GC, GM-GC; estimated AASHTO classification—A-2

11 to 12 inches—weathered bedrock

12 inches—weathered bedrock

**Soil and water features**

**Depth to bedrock:** 4 to 11 inches

**Depth to a seasonal high water table:** More than 60 inches

Flooding: None

Permeability: Moderately rapid

Available water capacity: 0.6 inch to 1.1 inches

Water-supplying capacity: About 8 inches

Runoff: Very rapid

Hydrologic group: D

Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—8

Hazard of erosion: By water—severe; by wind—slight

Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Moderate

**Characteristics of the Moderately Steep Puffer Soil**

**Position on landscape:** Mountain side slopes, foothills

**Parent material:** Kind—residuum; source—shale, limestone

**Slope features:** Length—long; shape—plane to convex

**Dominant present vegetation:** Black sagebrush, shadscale, spiny hopsage, pine bluegrass, bottlebrush squirreltail

**Rock fragments on the surface:** Kind—channers, flagstones; percentage of surface covered—60

**Typical profile**

0 to 4 inches—very flaggy loam; 25 to 40 percent cobbles and stones and 35 to 55 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2, A-6, A-4

4 to 15 inches—very gravelly clay loam; 5 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

15 inches—unweathered bedrock

**Soil and water features**

**Depth to bedrock:** 14 to 20 inches

**Depth to a seasonal high water table:** More than 60 inches

Flooding: None

Permeability: Moderately slow

Available water capacity: 1.1 to 1.4 inches

Water-supplying capacity: About 8 inches

Runoff: Rapid

Hydrologic group: D

Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—8

Hazard of erosion: By water—severe; by wind—slight

Shrink-swell potential: Moderate

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Moderate

**Characteristics of the Atlow Soil**

**Position on landscape:** South- and west-facing side slopes of mountains

**Parent material:** Kind—residuum; source—shale, sandstone, mudstone
cobbles and stones and 35 to 60 percent pebbles
(by weight); platy structure; soft, very friable;
moderately alkaline (pH 8.2); non saline (less than 2
mmhos/cm); nonsodic (SAR less than 2); estimated
Unified classification—GM-GC; estimated AASHTO
classification—A-2, A-4
4 to 11 inches—very gravelly loam; 15 to 40 percent
cobbles and stones and 50 to 70 percent pebbles
(by weight); massive; soft, very friable; moderately
alkaline (pH 8.4); nonsaline (less than 2 mmhos/
cm); nonsodic (SAR less than 2); estimated
Unified classification—GP-GC, GM-GC; estimated AASHTO
classification—A-2
11 to 12 inches—weathered bedrock
12 inches—weathered bedrock

Soil and water features

Depth to bedrock: 4 to 11 inches
Depth to a seasonal high water table: More than 60
inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 0.6 inch to 1.1 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—0.2; T value—
1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: North-facing side slopes of
mountains
Distinctive present vegetation: Desert needlegrass
Inclusion 2
Position on landscape: Concave valley fans on
mountains
Distinctive present vegetation: Wyoming big sagebrush
Inclusion 3
Position on landscape: Concave, north- and east-facing
side slopes of mountains
Distinctive present vegetation: Wyoming big sagebrush
Inclusion 4
Position on landscape: Convex foot slopes of mountains
Distinctive present vegetation: Shadscale, bud
sagebrush
Other minor inclusions
• Barren areas of rock outcrop on the crests and upper
side slopes of mountains

Major Uses

Current uses: Rangeland, wildlife habitat
Wildlife habitat elements

Suitability of the very steep Puffer soil for named
elements: Wild herbaceous plants (nonirrigated)—
poor; shrubs (nonirrigated)—poor
Suitability of the Atlow soil for named elements: Wild
herbaceous plants (nonirrigated)—fair; shrubs
(nonirrigated)—fair
Suitability of the moderately steep Puffer soil for named
elements: Wild herbaceous plants (nonirrigated)—
poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the very steep
Puffer soil for selected uses and practices

Range seeding: Poor—droughty, large stones, erodes
easily
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embarkments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Atlow soil for
selected uses and practices

Range seeding: Poor—droughty, large stones, erodes
easily
Daily cover for landfill: Poor—depth to bedrock, small
stones, slope
Shallow excavations: Severe—depth to bedrock, small
stones, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embarkments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the moderately
steep Puffer soil for selected uses and practices

Range seeding: Poor—droughty, large stones
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—large stones

Interpretive Groups
Capability classification: Puffer, very steep—VII, nonirrigated; A-low—VII, nonirrigated; Puffer, moderately steep—VII, nonirrigated
Range site: Puffer, very steep—027X0032N; A-low—027X032N; Puffer, moderately steep—027X032N

960—Findout-Puffer-Rock outcrop association

Map Unit Setting
Position on landscape: Mountains
Elevation: 4,500 to 6,000 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 105 days

Composition

Major components:
- Findout very gravelly loam, 30 to 50 percent slopes—Lithic Calciorthids, loamy-skeletal, carbonatic, mesic—45 percent
- Puffer very cobbly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—35 percent
- Rock outcrop—15 percent

Contrasting inclusions:
- Inclusion 1: Findout very cobbly loam, 4 to 15 percent slopes—Lithic Calciorthids, loamy-skeletal, carbonatic, mesic—5 percent

Characteristics of the Findout Soil
Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—limestone, dolomite
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail, desert needlegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—45

Typical profile
0 to 4 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 45 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2
4 to 8 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2
8 to 14 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 45 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2
14 to 18 inches—weathered bedrock
18 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 8 to 14 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.3 to 1.8 inches
Water-supplying capacity: About 6 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Puffer Soil
Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—limestone, shale
Slope features: Length—long; shape—convex
Dominant present vegetation: Black sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—60

Typical profile
0 to 2 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
2 to 11 inches—very gravelly loam; 15 to 40 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GC, GM-GC; estimated AASHTO classification—A-2
11 to 12 inches—weathered bedrock
12 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 4 to 11 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 0.6 inch to 1.1 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.20; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Rock Outcrop

Position on landscape: The tops and side slopes of mountains
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex mountain tops
Distinctive present vegetation: Desert needlegrass, shadscale

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Findout soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Puffer soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Findout soil for selected uses and practices

Range seeding: Poor—too arid, droughty, small stones
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—depth to bedrock, slope

Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Puffer soil for selected uses and practices

Range seeding: Poor—droughty, small stones, erodes easily
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—large stones

Interpretive Groups

Capability classification: Findout—VIIa, nonirrigated; Puffer—VIIa, nonirrigated; Rock outcrop—VIIa
Range site: Findout—027X017N; Puffer—024X030N

980—Mazuma very fine sandy loam, 0 to 4 percent slopes

Map Unit Setting

Position on landscape: Lake plains
Elevation: 3,800 to 4,200 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 120 days

Composition

Major component:
- Mazuma very fine sandy loam, 0 to 4 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—85 percent

Contrasting inclusions:
- Inclusion 1: Playas—5 percent
- Inclusion 2: Typic Torriorthents silt loam, 0 to 2 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 3: Trocken gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

Characteristics of the Mazuma Soil

Position on landscape: Lake plain terraces
Parent material: Alluvium and lacustrine material derived from mixed rock sources
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, bud sagebrush

Typical profile
0 to 10 inches—very fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
10 to 60 inches or more—stratified gravelly coarse sand to silt loam; 0 to 20 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); moderately sodic or strongly sodic (SAR 23 to 100); estimated Unified classification—SM; estimated AASHTO classification—A-4

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 6.3 to 8.5 inches
Water-supplying capacity: About 4 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions
Inclusion 1
Position on landscape: Smooth and slightly concave lake plain terraces
Distinctive present vegetation: Barren
Inclusion 2
Position on landscape: Channels
Distinctive present vegetation: Torrey quailbrush
Inclusion 3
Position on landscape: Slightly convex fan skirts
Distinctive present vegetation: Bluegrass, shadscale, bud sagebrush

Major Uses
Current uses: Rangeland, wildlife habitat
Wildlife habitat elements

Suitability of the Mazuma soil for named elements: Grain and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Mazuma soil for selected uses and practices
Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—too sandy, excess salt
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Excess salt
Terraces and diversions: Erodes easily, too sandy

Interpretive Groups
Capability classification: IIC, irrigated, and VIIc, nonirrigated
Range site: 027X028N

981—Mazuma fine sandy loam, strongly saline-sodic, 0 to 2 percent slopes

Map Unit Setting
Position on landscape: Fan skirts
Elevation: 4,000 to 4,300 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 120 days

Composition
Major component:
• Mazuma fine sandy loam, strongly saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcicaceous), mesic—85 percent
Contrasting inclusions:
• Inclusion 1: Mazuma silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcicaceous), mesic—10 percent
• Inclusion 2: Typic Torriorthents loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcicaceous), mesic—5 percent

Characteristics of the Mazuma Soil
Position on landscape: Fan skirts adjacent to alluvial flats
Parent material: Alluvium and lacustrine material derived from mixed rock sources
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, shadscale, seepweed

Typical profile

0 to 13 inches—fine sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 46 to 100); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

13 to 22 inches—sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

22 to 60 inches—stratified silt loam to gravelly coarse sand; 15 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SM, ML; estimated AASHTO classification—A-2, A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 5.7 to 6.9 inches
Water-supplying capacity: About 5 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—moderate
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Smooth fan skirts
Distinctive present vegetation: Bluegrass, shadscale, bud sagebrush

Inclusion 2
Position on landscape: Convex fan piedmont remnants adjacent to fan skirts
Distinctive present vegetation: Black greasewood

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Mazuma soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Mazuma soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping, excess salt, excess sodium

Interpretive Groups
Capability classification: VII, nonirrigated
Range site: 027X025N

983—Mazuma-Swingler-Trocken association

Map Unit Setting
Position on landscape: Lake plains, beach plains
Elevation: 3,800 to 4,200 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 115 days

Composition

Major components:
- Mazuma silt loam, moderately saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—50 percent
- Swingler silt loam, strongly saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—20 percent
- Trocken gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Bluewing very cobbly loam, rarely flooded, 0 to 2 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—5 percent
- Inclusion 2: Hawsley fine sand, 2 to 8 percent slopes—Typic Torriorthents, mixed, mesic—5 percent

Characteristics of the Mazuma Soil
Position on landscape: The higher lake plain terraces
**Parent material:** Lacustrine sediments derived from mixed rock sources

**Slope features:** Length—long; shape—smooth

**Dominant present vegetation:** Shadscale, black greasewood, seepweed, Bailey greasewood

**Typical profile**

0 to 13 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 22 inches—sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

22 to 60 inches—stratified silt loam to gravelly coarse sand; 15 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SM, ML; estimated AASHTO classification—A-2, A-4

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Moderately slow

**Available water capacity:** 9.1 to 11.0 inches

**Water-supplying capacity:** About 5 inches

**Runoff:** Very slow

**Hydrologic group:** B

**Erosion factors (surface layer):** K value—.55; T value—5; wind erodibility group—4L

**Hazard of erosion:** By water—slight; by wind—slight

**Shrink-swell potential:** Moderate

**Corrosivity:** To steel—high; to concrete—high

**Potential for frost action:** Low

**Characteristics of the Trocken Soil**

**Position on landscape:** Offshore bars

**Parent material:** Mixed gravelly and sandy alluvium

**Slope features:** Length—short; shape—convex

**Dominant present vegetation:** Shadscale, bud sagebrush

**Rock fragments on the surface:** Kind—gravel, cobbles; percentage of surface covered—30

**Typical profile**

0 to 3 inches—gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4

3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobbly loam; 5 to 40 percent cobbles and stones and 60 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 3.0 to 4.8 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—0.32; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Concave inset fans
Distinctive present vegetation: Rabbitbrush

Inclusion 2
Position on landscape: Low dunes and sand sheets
Distinctive present vegetation: Fourwing saltbush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Mazuma soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Swingler soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Trocken soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Mazuma soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping, excess sodium, excess salt

Ratings and restrictive features of the Swingler soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—low strength, shrink-swell
Roadfill: Fair—low strength, thin layer, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping, excess salt, excess sodium

Ratings and restrictive features of the Trocken soil for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—large stones
Roadfill: Fair—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—large stones

Interpretive Groups

Capability classification: Mazuma—IIIs, irrigated, and VIIIs, nonirrigated; Swingler—VIIw, nonirrigated; Trocken—VIIIs, nonirrigated
Range site: Mazuma—027X024N; Swingler—027X024N; Trocken—027X028N

984—Mazuma-Bluewing-Woolsey association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 3,900 to 4,000 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Mazuma fine sandy loam, strongly saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—35 percent
- Bluewing very gravelly sandy loam, 2 to 8 percent
slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—30 percent
  • Woolsey gravelly fine sandy loam, 2 to 8 percent slopes—Typic Haplorgids, coarse-loamy, mixed, mesic—20 percent

Contrasting inclusions:
  • Inclusion 1: Hawley fine sand, moderately wet, 0 to 4 percent slopes—Typic Torriorthents, mixed, mesic—5 percent
  • Inclusion 2: Raggton silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine, montmorillonitic (calcareous), mesic—4 percent
  • Inclusion 3: Bluwing very cobbly sandy loam, 0 to 4 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—4 percent
  • Inclusion 4: Playas—2 percent

Characteristics of the Mazuma Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, black greasewood, seaasweed

Typical profile
0 to 13 inches—fine sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
13 to 22 inches—sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
22 to 60 inches—stratified silt loam to gravelly coarse sand; 15 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SM, ML; estimated AASHTO classification—A-2, A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very rapid
Available water capacity: 1.9 to 3.1 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: A
Erosion factors (surface layer): K value—.10; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Woolsey Soil

Position on landscape: Fan piedseye remnants
Parent material: Mixed alluvium and lacustrine sediments
Slope features: Length—long; shape—convex

Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—moderate
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low
Dominant present vegetation: Bailey greasewood, shadscale, bud sagebrush

Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—42

Typical profile

0 to 9 inches—gravelly fine sandy loam; 25 to 50 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2

9 to 14 inches—gravelly sandy loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, SM-SC, GM, SM; estimated AASHTO classification—A-2

14 to 60 inches—stratified sandy loam and gravelly sandy loam; 15 to 50 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, ML, SM; estimated AASHTO classification—A-2, A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 7.3 to 8.7 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—20; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex sand sheets
Distinctive present vegetation: Indian ricegrass, black greasewood

Inclusion 2
Position on landscape: Slightly convex lake plain terraces adjacent to the lower part of fan skirts
Distinctive present vegetation: Inland saltgrass, black greasewood

Inclusion 3
Position on landscape: Drainageways

Distinctive present vegetation: Indian ricegrass, shadscale

Inclusion 4
Position on landscape: The plane lower part of lake plain terraces

Distinctive present vegetation: Barren

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Mazuma soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Bluewing soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the Woolsey soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Mazuma soil for selected uses and practices
Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium

Ratings and restrictive features of the Bluewing soil for selected uses and practices

Range seeding: Poor—too arid, small stones, droughty
Daily cover for landfill: Poor—seepage, too sandy, too small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty, slope
Terraces and diversions: Large stones, too sandy
Ratings and restrictive features of the Woolsey soil for selected uses and practices

Range seeding: Poor—too arid
Daily cover for landfill: Fair—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping

Interpretive Groups

Capability classification: Mazuma—VIIc, nonirrigated;
Bluewing—IVc, irrigated, and VIIc, nonirrigated;
Woolsey—V VIIc, nonirrigated
Range site: Mazuma—027X025N; Bluewing—
027X018N; Woolsey—027X018N

985—Mazuma-Toulon-Chumall association

Map Unit Setting

Position on landscape: Lake plains, beach plains
Elevation: 3,600 to 4,200 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 115 days

Composition

Major components:
- Mazuma silt loam, moderately saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—40 percent
- Toulon very gravelly loam, 2 to 8 percent slopes—Typic Camborthids, sandy-skeletal, mixed, mesic—30 percent
- Chumall silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Isoide fine sand, 4 to 15 percent slopes—Typic Torriipsamments, mixed, mesic—5 percent
- Inclusion 2: Parran silty clay, 0 to 2 percent slopes—Typic Salorthids, fine, montomorillonitic, mesic—5 percent

Characteristics of the Mazuma Soil

Position on landscape: Lake plain terraces
Parent material: Lacustrine sediments derived from mixed rock sources
Slope features: Length—long; shape—smooth
Dominant present vegetation: Shadscale, black greasewood, seepweed, Bailey greasewood

Typical profile

0 to 13 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhcs/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4
13 to 22 inches—sandy loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhcs/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
22 to 60 inches—stratified silt loam to gravelly coarse sand; 15 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhcs/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SM, ML; estimated AASHTO classification—A-2, A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Floodings: None
Permeability: Moderately rapid
Available water capacity: 5.7 to 6.9 inches
Water-supplying capacity: About 5 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—
5; wind erosionability group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Toulon Soil

Position on landscape: Barrier bars
Parent material: Waterworn pebbles, sand, and a small amount of silt derived from mixed rock sources
Slope features: Length—short; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, Bailey greasewood
Rock fragments on the surface: Kind—gravel; percentage of surface covered—75

Typical profile

0 to 5 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhcs/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
5 to 18 inches—very gravely loam; 0 to 5 percent cobbles and stones and 60 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-4

18 to 60 inches—stratified gravelly coarse sand to extremely cobbly coarse sand; 25 to 50 percent cobbles and stones and 60 to 75 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Rapid
Available water capacity: 2.3 to 4.2 inches
Water-supplying capacity: About 5 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.28; T value—1; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Chumall Soil

Position on landscape: Lagoons
Parent material: Silty alluvium over lacustrine sediments derived from mixed sources
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, Bailey greasewood, seepweed, shadscale

Typical profile

0 to 7 inches—silt loam; platy structure; very hard, friable; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6
7 to 14 inches—silt loam; platy structure; hard, friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4
14 to 60 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL-ML, ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 10.5 to 12.1 inches
Water-supplying capacity: About 5 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Sand dunes
Distinctive present vegetation: Indian ricegrass, black greasewood

Inclusion 2
Position on landscape: The smooth central part of lagoons
Distinctive present vegetation: Inland saltgrass, black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Mazuma soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Toulon soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—very poor

Suitability of the Chumall soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Mazuma soil for selected uses and practices

Range seeding: Poor—to arid, excess salt, excess sodium
Daily cover for landfill: Poor—to sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping, excess salt, excess sodium
Drainage: Deep to water
Irrigation: Excess sodium
Terraces and diversions: Erodes easily, too sandy

Ratings and restrictive features of the Toulon soil for selected uses and practices
Range seeding: Poor—too arid, droughty, small stones
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—large stones
Roadfill: Fair—large stones
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, too sandy
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Large stones, droughty, slope
Terraces and diversions: Large stones, too sandy

Ratings and restrictive features of the Chumall soil for selected uses and practices
Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Severe—low strength
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Severe—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping, excess salt, excess sodium

Interpretive Groups
Capability classification: Mazuma—IIs, irrigated, and VIIIs, nonirrigated; Toulon—IVs, irrigated, and VIIIs, nonirrigated; Chumall—VIIIs, nonirrigated
Range site: Mazuma—027X024N; Toulon—027X030N; Chumall—027X024N

Elevation: 3,800 to 4,500 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition
Major components:
- Mazuma very fine sandy loam, 2 to 4 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—70 percent
- Trocken gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—15 percent

Contrasting inclusions:
- Inclusion 1: Typic Natargids gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Natargids, fine-loamy, mixed, mesic—5 percent
- Inclusion 2: Bluewing gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Typic Torriorthents silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—3 percent
- Inclusion 4: Dun Glen silt loam, frequently flooded, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—2 percent

Characteristics of the Mazuma Soil
Position on landscape: Fan skirts
Parent material: Alluvium and lacustrine material derived from mixed rock sources
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush

Typical profile
0 to 10 inches—very fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
10 to 60 inches—stratified gravelly coarse sand to silt loam; 0 to 20 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline or moderately saline (4 to 16 mmhos/cm); moderately sodic or strongly sodic (SAR 24 to 100); estimated Unified classification—SM; estimated AASHTO classification—A-4

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 6.3 to 8.5 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

**Characteristics of the Trocken Soil**

Position on landscape: Barrier bars
Parent material: Mixed alluvium
Slope features: Length—short; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

**Typical profile**

0 to 3 inches—gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4

3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobbly loam; 5 to 40 percent cobbles and stones and 60 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

**Soil and water features**

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 3.0 to 4.8 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.32; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

**Contrasting Inclusions**

Inclusion 1
Position on landscape: The convex upper part of fan skirts adjacent to fan piedmont remnants

**Distinctive present vegetation:** Bailey greasewood

**Inclusion 2**
Position on landscape: Narrow drainageways on fan skirts

**Distinctive present vegetation:** Bailey greasewood

**Inclusion 3**
Position on landscape: The slightly concave lower part of fan skirts

**Distinctive present vegetation:** Sickle saltbush

**Inclusion 4**
Position on landscape: Slightly concave lagoons

**Distinctive present vegetation:** Winterfat

**Major Uses**

Current uses: Rangeland, wildlife habitat

**Wildlife habitat elements**

Suitability of the Mazuma soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Trocken soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings and restrictive features of the Mazuma soil for selected uses and practices**

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—too sandy
Shallow excavations: Severe—cutbanks cave Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—too sandy, excess salt
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Slope, excess salt
Terraces and diversions: Erodes easily, too sandy

**Ratings and restrictive features of the Trocken soil for selected uses and practices**

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—large stones
Roadfill: Fair—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—large stones
Drainage: Deep to water
Irrigation: Slope, large stones, droughty
Terraces and diversions: Too sandy, large stones

Interpretive Groups

Capability classification: Mazuma—Ilc, irrigated, and VIIc, nonirrigated; Trocken—IVs, irrigated, and VIIs, nonirrigated
Range site: Mazuma—027X028N; Trocken—027X028N

987—Mazuma-Yipor association

Map Unit Setting

Position on landscape: Lake plains
Elevation: 4,000 to 4,200 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 50 degrees E
Frost-free period: About 110 days

Composition

Major components:
- Mazuma very fine sandy loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—50 percent
- Yipor silt loam, warm, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—35 percent

Contrasting inclusions:
- Inclusion 1: Playas—5 percent
- Inclusion 2: Bluewing cobbly loam, frequently flooded, 2 to 4 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—4 percent
- Inclusion 3: Hawsley fine sand, 0 to 2 percent slopes—Typic Torripsamments, mixed, mesic—3 percent
- Inclusion 4: Typic Camborthids silt loam, frequently flooded, 0 to 2 percent slopes—Typic Camborthids, coarse-loamy, mixed, mesic—3 percent

Characteristics of the Mazuma Soil

Position on landscape: The lower part of lake plain terraces
Parent material: Alluvium and lacustrine material derived from mixed rock sources
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush

Typical profile

0 to 10 inches—very fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
10 to 60 inches—stratified gravelly coarse sand to silt loam; 0 to 20 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline or moderately saline (4 to 16 mmhos/cm); moderately sodic or strongly sodic (SAR 24 to 100); estimated Unified classification—SM; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 6.3 to 8.5 inches
Water-supplying capacity: About 6 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Yipor Soil

Position on landscape: Lake plain terraces
Parent material: Mixed silty alluvium influenced by loess
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Black greasewood, shadscale, bottlebrush squirreltail

Typical profile

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—ML; estimated AASHTO classification—A-4
5 to 60 inches—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: Rare
Permeability: Moderate
Available water capacity: 9.7 to 11.5 inches
Water-supplying capacity: About 6 inches
Runoff: Pondered
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

**Contrasting Inclusions**

Inclusion 1
*Position on landscape:* The lower part of lake plain terraces
*Distinctive present vegetation:* Barren

Inclusion 2
*Position on landscape:* Channels
*Distinctive present vegetation:* Rubber rabbitbrush, Bailey greasewood

Inclusion 3
*Position on landscape:* Slightly convex sand sheets
*Distinctive present vegetation:* Nevada dalea, Indian ricegrass

Inclusion 4
*Position on landscape:* Slightly concave inset fans
*Distinctive present vegetation:* Winterfat

**Major Uses**

*Current uses:* Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Mazuma soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Yipor soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings and restrictive features of the Mazuma soil for selected uses and practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium
*Daily cover for landfill:* Poor—too sandy
*Shallow excavations:* Severe—cutbanks cave
*Local roads and streets:* Slight
*Roadfill:* Good
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—too sandy, excess salt
*Pond reservoir areas:* Severe—seepage
*Embankments, dikes, and levees:* Severe—piping
*Drainage:* Deep to water
*Irrigation:* Excess salt

*Terraces and diversions:* Erodes easily, too sandy

**Ratings and restrictive features of the Yipor soil for selected uses and practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium
*Daily cover for landfill:* Good
*Shallow excavations:* Slight
*Local roads and streets:* Moderate—flooding
*Roadfill:* Good
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—excess salt
*Pond reservoir areas:* Moderate—seepage
*Embankments, dikes, and levees:* Severe—piping, excess salt
*Drainage:* Deep to water
*Irrigation:* Erodes easily, excess salt
*Terraces and diversions:* Erodes easily

**Interpretive Groups**

*Capability classification:* Mazuma—IIC, irrigated, and YIP, nonirrigated; Yipor—III, irrigated, and VII, nonirrigated
*Range site:* Mazuma—027X028N; Yipor—027X024N

**988—Mazuma very fine sandy loam, 2 to 8 percent slopes**

**Map Unit Setting**

*Position on landscape:* Fan skirts
*Elevation:* 4,000 to 5,000 feet
*Average annual precipitation:* About 6 inches
*Average annual air temperature:* About 50 degrees F
*Frost-free period:* About 110 days

**Composition**

*Major component:* Mazuma very fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—85 percent

**Contrasting inclusions:**
- Inclusion 1: Durorthic Torriorthents silt loam, 0 to 2 percent slopes—Durothic Torriorthents, coarse-loamy, mixed (calcareous), mesic—8 percent
- Inclusion 2: Hawsley sand, moderately wet, 4 to 15 percent slopes—Typic Torriorthents silt loam, mixed, mesic—3 percent
- Inclusion 3: Typic Torriorthents silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent
- Inclusion 4: Xeric Torriorthents, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—1 percent
Characteristics of the Mazuma Soil

*Position on landscape:* Fan skirts
*Parent material:* Alluvium and lacustrine material derived from mixed rock sources
*Slope features:* Length—long; shape—convex
*Dominant present vegetation:* Shadscale, bud sagebrush

**Typical profile**

0 to 10 inches—very fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
10 to 60 inches—stratified gravelly coarse sand to silt loam; 0 to 20 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline or moderately saline (4 to 16 mmhos/cm); moderately sodic or strongly sodic (SAR 24 to 100); estimated Unified classification—SM; estimated AASHTO classification—A-4

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Moderately rapid
*Available water capacity:* 6.3 to 8.5 inches
*Water-supplying capacity:* About 6 inches
*Runoff:* Very slow
*Hydrologic group:* B
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* Low
*Corrosivity:* To steel—high; to concrete—high
*Potential for frost action:* Low

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* The slightly concave lower part of fan skirts
*Distinctive present vegetation:* Black greasewood

**Inclusion 2**
*Position on landscape:* Sand dunes
*Distinctive present vegetation:* Nevada dalea, Indian ricegrass

**Inclusion 3**
*Position on landscape:* Slightly concave fan skirts
*Distinctive present vegetation:* Bailey greasewood, Indian ricegrass

**Inclusion 4**
*Position on landscape:* Channels

**Distinctive present vegetation:** Rubber rabbitbrush, Wyoming big sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements**

**Suitability of the Mazuma soil for named elements:** Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings and restrictive features of the Mazuma soil for selected uses and practices**

*Range seeding:* Poor—too arid, excess salt, excess sodium
*Daily cover for landfill:* Poor—too sandy
*Shallow excavations:* Severe—cutbanks cave
*Local roads and streets:* Slight
*Roadfill:* Good
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—too sandy, excess salt
*Pond reservoir areas:* Severe—seepage
*Embankments, dikes, and levees:* Severe—piping
*Drainage:* Deep to water
*Irrigation:* Excess salt, erodes easily, slope
*Terraces and diversions:* Erodes easily, too sandy

**Interpretive Groups**

*Capability classification:* IIe, irrigated, and VIIc, nonirrigated
*RANGE site:* 027X028N

990—Argenta very fine sandy loam, 0 to 2 percent slopes

**Map Unit Setting**

*Position on landscape:* Lake plains
*Elevation:* 3,500 to 4,000 feet
*Average annual precipitation:* About 6 inches
*Average annual air temperature:* About 49 degrees F
*Frost-free period:* About 120 days

**Composition**

*Major component:*• Argenta very fine sandy loam, 0 to 2 percent slopes—Aeric Halaquepts, coarse-loamy, mixed (calcareous), mesic—85 percent

**Contrasting inclusions:**

*Inclusion 1:* Aquic Durorthic Torriorthents silt loam, 0
to 2 percent slopes—Aquic Durorthic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
• Inclusion 2: Typic Torrifluvents loam, 0 to 2 percent slopes—Typic Torrifluvents, sandy-skeletal, mixed, mesic—5 percent
• Inclusion 3: Aquentic Durorthods silt loam, 0 to 2 percent slopes—Aquentic Durorthods, fine-silty, mixed, mesic—5 percent

**Characteristics of the Argenta Soil**

*Position on landscape:* Lake plain terraces
*Parent material:* Mixed alluvium
*Slope features:* Length—long; shape—smooth
*Dominant present vegetation:* Black greasewood, rabbitbrush, basin wildrye, inland saltgrass
*Rock fragments on the surface:* Kind—gravel; percentage of surface covered—3

**Typical profile**

0 to 6 inches—very fine sandy loam; platy structure; soft, very friable; very strongly alkaline (pH 9.4); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML; estimated AASHTO classification—A-4
6 to 36 inches—fine sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML; estimated AASHTO classification—A-4
36 to 60 inches—gravelly sandy loam; 35 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic or slightly sodic (SAR less than 23); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

**Soil and water features**

*Depth to a seasonal high water table:* February through July—36 to 42 inches; rest of year—more than 60 inches
*Flooding:* Rare
*Permeability:* Moderate
*Available water capacity:* 7.7 to 8.9 inches
*Water-supplying capacity:* About 11 inches
*Runoff:* Very slow
*Hydrologic group:* C
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* Low
*Corrosivity:* To steel—high; to concrete—high
*Potential for frost action:* High

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* Smooth fringes of lake plain terraces
*Distinctive present vegetation:* Black greasewood

**Inclusion 2**
*Position on landscape:* Slightly concave, narrow drainageways on lake plain terraces
*Distinctive present vegetation:* Shadscale, black greasewood

**Inclusion 3**
*Position on landscape:* Smooth fringes of lake plain terraces
*Distinctive present vegetation:* Basin wildrye, alkali sacaton

**Major Uses**

*Current uses:* Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Argenta soil for named elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings and restrictive features of the Argenta soil for selected uses and practices**

*Range seeding:* Poor—excess salt, excess sodium, too crusty
*Daily cover for landfill:* Poor—excess salt, excess sodium
*Shallow excavations:* Moderate—wetness
*Local roads and streets:* Severe—frost action
*Roadfill:* Good
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—excess salt, excess sodium
*Pond reservoir areas:* Severe—seepage
*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium
*Drainage:* Deep to water
*Irrigation:* Soil blowing, erores easily
*Terraces and diversions:* Erodes easily, soil blowing

**Interpretive Groups**

*Capability classification:* IIIw, irrigated, and VIIw, nonirrigated
*Range site:* 024X007N
1020—Wholan very fine sandy loam, rarely flooded, 0 to 2 percent slopes

Map Unit Setting

Position on landscape: Fan skirts
Elevation: 4,500 to 5,000 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

Composition

Major component:
- Wholan very fine sandy loam, rarely flooded, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—90 percent

Contrasting inclusions:
- Inclusion 1: Misad very gravelly loam, 0 to 2 percent slopes—Durothidic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 2: Orovada very fine sandy loam, 0 to 2 percent slopes—Durixeroll Camborthids, coarse-loamy, mixed, mesic—5 percent

Characteristics of the Wholan Soil

Position on landscape: Fan skirts
Parent material: Silty alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Shadscale, bud sagebrush

Typical profile

0 to 5 inches—very fine sandy loam; platy structure; slightly hard, very friable; moderately alkaline (pH 7.9); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
5 to 60 inches—silt loam; weak fine subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: Rare
Permeability: Moderate
Available water capacity: 9.7 to 10.9 inches
Water-supplying capacity: About 6 inches
Runoff: Very slow
Hydological group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—3

Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly convex fan skirts
Distinctive present vegetation: Shadscale, bud sagebrush

Inclusion 2
Position on landscape: Channels
Distinctive present vegetation: Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat
Foreseeable uses: Rangeland, wildlife habitat, irrigated cropland

Wildlife habitat elements

Suitability of the Wholan soil for named elements: Grain and seed crops (irrigated)—good; grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Wholan soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—flooding
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Erodes easily
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: IIc, irrigated, and VIIc, nonirrigated
Range site: 024X002N

1030—Wendane-Yobe association

Map Unit Setting

Position on landscape: Lake plains
Elevation: 4,300 to 4,600 feet
Average annual precipitation: About 6 inches  
Average annual air temperature: About 50 degrees F  
Frost-free period: About 110 days

**Composition**

**Major components:**
- Wendane silt loam, drained, 0 to 2 percent slopes—Aeric Halaquupts, fine-silty, mixed (calcareous), mesic—55 percent  
- Yobe silt loam, occasionally flooded, 0 to 2 percent slopes—Aeric Halaquupts, fine-silty, mixed (calcareous), mesic—35 percent

**Contrasting inclusions:**
- Inclusion 1: Weso very fine sandy loam, moderately saline-alkali, 0 to 2 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—5 percent  
- Inclusion 2: Misad gravelly very fine sandy loam, 0 to 2 percent slopes—Durothric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent

**Characteristics of the Wendane Soil**

**Position on landscape:** The higher lake plain terraces  
**Parent material:** Silty alluvium derived from mixed sediments  
**Slope features:** Length—long; shape—smooth  
**Dominant present vegetation:** Torrey quailbush, black greasewood

**Typical profile**

0 to 11 inches—silt loam; platy structure; slightly hard, friable; very strongly alkaline (pH 9.4); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4, A-6  
11 to 60 inches—silty clay loam; massive; slightly hard, firm; very strongly alkaline (pH 9.2); slightly saline or moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches (artificially drained)  
**Flooding:** Frequency—occasional; duration—brief; months—December through May  
**Permeability:** Moderately slow  
**Available water capacity:** 10.2 to 12.0 inches  
**Water-supplying capacity:** About 15 inches  
**Runoff:** Very slow  
**Hydrologic group:** B

**Erosion factors (surface layer):** K value—.55; T value—5; wind erodibility group—4L  
**Hazard of erosion:** By water—slight; by wind—slight  
**Shrink-swell potential:** Moderate  
**Corrosivity:** To steel—high; to concrete—high  
**Potential for frost action:** Moderate

**Characteristics of the Yobe Soil**

**Position on landscape:** The lower lake plain terraces  
**Parent material:** Mixed lake sediments  
**Slope features:** Length—long; shape—slightly concave  
**Dominant present vegetation:** Black greasewood, basin wildrye

**Typical profile**

0 to 14 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6  
14 to 60 inches—stratified very fine sandy loam to silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6

**Soil and water features**

**Depth to a seasonal high water table:** November through May—36 to 60 inches; rest of year—more than 60 inches  
**Flooding:** Frequency—occasional; duration—brief; months—February through June  
**Permeability:** Moderately slow  
**Available water capacity:** 11.0 to 12.0 inches  
**Water-supplying capacity:** About 15 inches  
**Runoff:** Ponded  
**Hydrologic group:** C  
**Erosion factors (surface layer):** K value—.43; T value—5; wind erodibility group—4L  
**Hazard of erosion:** By water—slight; by wind—slight  
**Shrink-swell potential:** Moderate  
**Corrosivity:** To steel—high; to concrete—high  
**Potential for frost action:** High

**Contrasting Inclusions**

**Inclusion 1**

**Position on landscape:** Fan skirts adjacent to lake plains  
**Distinctive present vegetation:** Shadscale

**Inclusion 2**

**Position on landscape:** Fan skirts  
**Distinctive present vegetation:** Shadscale
Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Wendane soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Yobe soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Wendane soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too crusty
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Roadfill: Fair—low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—piping, excess salt, excess sodium

Ratings and restrictive features of the Yobe soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too crusty
Daily cover for landfill: Poor—excess sodium, excess salt
Shallow excavations: Moderate—flooding, wetness
Local roads and streets: Severe—flooding, low strength, frost action
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt, excess sodium

Interpretive Groups

Capability classification: Wendane—VIIw, nonirrigated; Yobe—VIIw, nonirrigated

Range site: Wendane—024X015N; Yobe—024X011N

1070—Hoot-Burrita-Bojo association

Map Unit Setting

Position on landscape: Mountain side slopes
Elevation: 4,500 to 5,500 feet

Average annual precipitation: About 9 inches
Average annual air temperature: About 46 degrees F
Frost-free period: About 100 days

Composition

Major components:
- Hoot very cobbly loam, 30 to 50 percent slopes—Lithic Hapludalfs, loamy-skeletal, mixed, mesic—40 percent
- Burrita very cobbly loam, 30 to 50 percent slopes—Lithic Hapludalfs, clayey-skeletal, montmorillonitic, mesic—30 percent
- Bojo very cobbly loam, 30 to 50 percent slopes—Lithic Hapludalfs, loamy, mixed, mesic—15 percent

Contrasting inclusions:
- Inclusion 1: Bojo very cobbly loam, 4 to 15 percent slopes—Lithic Hapludalfs, loamy, mixed, mesic—6 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Xeric Torriorthents loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent
- Inclusion 4: Rubble land—1 percent

Characteristics of the Hoot Soil

Position on landscape: South- and west-facing side slopes on mountains
Parent material: Kind—residuum; source—andesite and related volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—55

Typical profile

0 to 4 inches—very cobbly loam; 25 to 45 percent cobbles and stones and 35 to 65 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4
4 to 14 inches—gravelly clay loam; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); subangular blocky structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2
14 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 0.8 inch to 1.2 inches
Water-supplying capacity: About 6 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—10; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Burrita Soil
Position on landscape: North-facing side slopes on mountains
Parent material: Kind—residuum; source—interbedded chert, quartzite, sandstone, shale, and metamorphic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—50

Typical profile
0 to 8 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GC; estimated AASHTO classification—A-4
8 to 17 inches—very gravelly clay; 10 to 55 percent cobbles and stones and 45 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7
17 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 1.4 to 1.8 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—15; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions
Inclusion 1
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Bottlebrush squirreltail, shadscale

**Inclusion 2**
Position on landscape: Scattered small peaks and ridges on mountains
Distinctive present vegetation: Barren

**Inclusion 3**
Position on landscape: Concave terraces adjacent to drainageways
Distinctive present vegetation: Basin wildrye, basin big sagebrush

**Inclusion 4**
Position on landscape: Slightly concave mountainsides
Distinctive present vegetation: Barren

**Major Uses**

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Hoot soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Burrita soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Bojo soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Hoot soil for selected uses and practices

Range seeding: Poor—droughty, small stones, too arid
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Bojo soil for selected uses and practices

Range seeding: Poor—droughty, small stones, too arid
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

**Capability classification:** Hoot—VIIa, nonirrigated; Burrita—VIIb, nonirrigated; Bojo—VIIa, nonirrigated

**Range site:** Hoot—024X002N; Burrita—024X005N; Bojo—024X026N

**1071—Hoot-Wiskan-Atlow association**

**Map Unit Setting**

Position on landscape: Mountain side slopes
Elevation: 5,000 to 6,000 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 45 degrees F
Frost-free period: About 100 days

**Composition**

Major components:
- Hoot very cobbly loam, 50 to 75 percent slopes—Lithic Hapludolls, loamy-skeletal, mixed, mesic—35 percent
- Wiskan very gravelly loam, 50 to 75 percent slopes—Xerollic Hapludolls, loamy-skeletal, mixed, frigid—30 percent
- Atlow very gravelly loam, 30 to 50 percent slopes—Lithic Xerolluvic Hapludolls, loamy-skeletal, mixed, mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Rock outcrop—5 percent
- Inclusion 2: Aridic Argixerolls very cobbly loam, 50 to 70 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—5 percent
- Inclusion 3: Sumya very cobbly loam; 50 to 75 percent slopes—Lithic Xeric Torriorthents, clayey-skeletal, montmorillonitic, nonacid, frigid—3 percent
- Inclusion 4: Fluventic Haploxerolls loam, 0 to 4
percent slopes— Fluventic Haploxerolls, fine-loamy, mixed, frigid—2 percent

**Characteristics of the Hoot Soil**

*Position on landscape:* South- and west-facing side slopes on mountains  
*Parent material:* Kind—residuum; source—andesite and related volcanic rocks  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, Sandberg bluegrass, scattered Utah juniper  
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—55

**Typical profile**

0 to 4 inches—very cobbly loam; 25 to 45 percent cobbles and stones and 35 to 65 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4  
4 to 14 inches—extremely gravely clay loam; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); subangular blocky structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2  
14 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 0.8 inch to 1.2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential for frost action:* Low

**Characteristics of the Wiskan Soil**

*Position on landscape:* North- and east-facing side slopes on mountains  
*Parent material:* Kind—residuum; source—siliceous volcanic rocks  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Black sagebrush, bluebunch wheatgrass, Thurber needlegrass, scattered Utah juniper  
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—52

**Typical profile**

0 to 9 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-1, A-2, A-4  
9 to 35 inches—very gravelly clay loam; 10 to 25 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2  
35 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.7 to 3.4 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Very rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—2; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential for frost action:* Moderate

**Characteristics of the Atlow Soil**

*Position on landscape:* South- and west-facing side slopes on mountains  
*Parent material:* Kind—residuum; source—chert, shale, tuff, other volcanic rocks  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Black sagebrush, Indian ricegrass, Thurber needlegrass, Sandberg bluegrass  
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—62

**Typical profile**

0 to 6 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles
(by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-6
6 to 15 inches—very gravelly clay loam; 0 to 45 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable, moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7
15 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.1 to 1.4 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Crests and north-facing side slopes of mountains
Distinctive present vegetation: Barren

Inclusion 2
Position on landscape: Concave, north-facing side slopes on mountains
Distinctive present vegetation: Mountain big sagebrush

Inclusion 3
Position on landscape: North-facing side slopes on mountains
Distinctive present vegetation: Utah juniper

Inclusion 4
Position on landscape: Concave toe slopes adjacent to drainageways on mountains
Distinctive present vegetation: Basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Hoot soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Wiskan soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Atlow soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Hoot soil for selected uses and practices

Range seeding: Poor—droughty, small stones, too arid
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, slope, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Wiskan soil for selected uses and practices

Range seeding: Poor—small stones, erodes easily
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Atlow soil for selected uses and practices

Range seeding: Poor—droughty, small stones
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Hoot—VII, nonirrigated;
Wiskan—VIls, nonirrigated; Atlow—VIls, nonirrigated

Range site: Hoot—024X002N; Wiskan—024X031N; Atlow—024X030N

1073—Hoot, steep-Bojo-Hoot association

Map Unit Setting

Position on landscape: Foothills
Elevation: 5,000 to 6,000 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 46 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Hoot very cobbly loam, 30 to 50 percent slopes—Lithic Haplorgids, loamy-skeletal, mixed, mesic—50 percent
- Bojo very cobbly loam, 30 to 50 percent slopes—Lithic Haplorgids, loamy, mixed, mesic—25 percent
- Hoot very cobbly loam, 4 to 15 percent slopes—Lithic Haplorgids, loamy-skeletal, mixed, mesic—15 percent

Contrasting inclusions:
- Inclusion 1: Xeric Torrithents, 2 to 8 percent slopes—Xeric Torrithents, coarse-loamy, mixed (calcaneous), mesic—4 percent
- Inclusion 2: Cleaver very cobbly loam, 15 to 30 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—3 percent
- Inclusion 3: Typic Haplorgids very cobbly loam, 15 to 30 percent slopes—Typic Haplorgids, clayey-skeletal, montmorillonitic, mesic—3 percent

Characteristics of the Steep Hoot Soil

Position on landscape: South- and west-facing side slopes of foothills
Parent material: Kind—residuum; source—andesite, basalt, other volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—55

Typical profile

0 to 4 inches—very cobbly loam; 25 to 45 percent cobbles and stones and 35 to 65 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4
4 to 14 inches—extremely gravelly clay loam; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); subangular blocky structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2
14 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 0.8 inch to 1.2 inches
Water-supplying capacity: About 6 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Bojo Soil

Position on landscape: North- and east-facing side slopes of foothills
Parent material: Kind—residuum; source—mixed metamorphic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, shadscale, Sandberg bluegrass, rabbitbrush
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—45

Typical profile

0 to 3 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 40 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4
3 to 10 inches—gravelly clay loam; 0 to 10 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6
10 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 5 to 14 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.3 to 1.7 inches
Water-supplying capacity: About 6 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

**Characteristics of the Strongly Sloping Hoot Soil**

Position on landscape: South- and west-facing side slopes of foothills
Parent material: Kind—residual; source—andesite, rhyolite, quartzite, other volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—55

**Typical profile**

0 to 4 inches—very cobbly loam; 25 to 45 percent cobbles and stones and 35 to 65 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-4
4 to 14 inches—extremely gravelly clay loam; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); subangular blocky structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2
14 inches—unweathered bedrock

**Soil and water features**

Depth to bedrock: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 0.8 inch to 1.2 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D

Erosion factors (surface layer): K value—.10; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

**Contrasting Inclusions**

**Inclusion 1**
Position on landscape: Terraces adjacent to drainageways
Distinctive present vegetation: Basin wildrye, basin big sagebrush

**Inclusion 2**
Position on landscape: Toe slopes
Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

**Inclusion 3**
Position on landscape: Toe slopes
Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

**Major Uses**

Current uses: Rangeland, wildlife habitat

**Wildlife habitat elements**

Suitability of the steep Hoot soil for named elements:
Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the Bojo soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the strongly sloping Hoot soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings and restrictive features of the steep Hoot soil for selected uses and practices**

Range seeding: Poor—droughty, small stones, too arid
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope

Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, slope, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

**Ratings and restrictive features of the Bojo soil for selected uses and practices**

Range seeding: Poor—droughty, small stones, too arid
Daily cover for landfill: Poor—small stones, slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the strongly sloping Hoot soil for selected uses and practices
Range seeding: Poor—too arid, rooting depth, droughty
Daily cover for landfill: Poor—small stones, depth to bedrock
Shallow excavations: Severe—depth to bedrock
Local roads and streets: Severe—depth to bedrock
Roadfill: Poor—depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups
Capability classification: Hoot, steep—VIIls, nonirrigated;
Bojo—VIIls, nonirrigated; Hoot, strongly sloping—VIIls, nonirrigated
Range site: Hoot, steep—024X002N; Bojo—024X026N;
Hoot, strongly sloping—024X002N

1090—Bojo Variant-Schamp-Trunk association

Map Unit Setting
Position on landscape: Foothills
Elevation: 5,000 to 6,000 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 100 days

Composition
Major components:
- Bojo Variant very cobbly loam, 15 to 30 percent slopes—Typic Haplargids, clayey, montmorillonitic, mesic, shallow—35 percent
- Schamp loam, 15 to 30 percent slopes—Xerolic Haplargids, fine, montmorillonitic, mesic—25 percent
- Trunk very cobbly loam, 4 to 15 percent slopes—Xerolic Haplargids, fine, montmorillonitic, mesic—25 percent

Contrasting inclusions:
- Inclusion 1: Rock outcrop—5 percent
- Inclusion 2: Xeric Torriorthents loam, 2 to 8 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 3: Atlow very gravelly loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic—5 percent

Characteristics of the Bojo Variant Soil
Position on landscape: South-facing side slopes of foothills
Parent material: Kind—residuum; source—ash-flow tuff
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, shadscale, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—45

Typical profile
0 to 5 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 55 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, CL-ML; estimated AASHO classification—A-2, A-4
5 to 9 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHO classification—A-2, A-6
9 to 18 inches—clay; 0 to 20 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CH; estimated AASHO classification—A-7
18 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 2.1 to 2.5 inches
Water-supplying capacity: About 7 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Schamp Soil

Position on landscape: North-facing side slopes of foothills
Parent material: Kind—residuum; source—tuff, andesite, basalt
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, bluebunch wheatgrass, scattered Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—20

Typical profile

0 to 6 inches—loam; 0 to 5 percent cobbles and stones and 5 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

6 to 34 inches—clay; 0 to 5 percent cobbles and stones and 0 to 20 percent pebbles (by weight); prismatic structure; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

34 to 60 inches—very cobbly loam; 25 to 60 percent cobbles and stones and 40 to 50 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, GM-GC, SC, SM-SC; estimated AASHTO classification—A-2, A-4, A-6

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 5.7 to 7.0 inches
Water-supplying capacity: About 9 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.10; T value—2; wind erodibility group—8
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Trunk Soil

Position on landscape: Crests of foothills
Parent material: Kind—residuum; source—chert, quartzite, shale
Slope features: Length—short; shape—convex
Dominant present vegetation: Wyoming big sagebrush, bluebunch wheatgrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—40

Typical profile

0 to 3 inches—very cobbly loam; 30 to 45 percent cobbles and stones and 25 to 50 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC, SC, GC; estimated AASHTO classification—A-4, A-6

3 to 30 inches—gravelly clay; 0 to 10 percent cobbles and stones and 40 to 50 percent pebbles (by weight); subangular blocky structure; very hard, firm; mildly alkaline (pH 7.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC, CH; estimated AASHTO classification—A-7

30 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 22 to 38 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.9 to 3.8 inches
Water-supplying capacity: About 9 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—2; wind erodibility group—8
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: The crests and upper side slopes of foothills
Distinctive present vegetation: Barren

Inclusion 2
Position on landscape: Concave toe slopes along drainage channels
Distinctive present vegetation: Basin big sagebrush
Inclusion 3

Position on landscape: Concave, north- and east-facing side slopes of foothills

Distinctive present vegetation: Black sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements:

Suitability of the Bojo Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the Schamp soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Trunk soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Bojo Variant soil for selected uses and practices

Range seeding: Poor—too arid, droughty, small stones
Daily cover for landfill: Poor—depth to bedrock, too clayey, hard to pack
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—low strength, slope, shrink-swell

Roadfill: Poor—depth to bedrock, low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Topsoil: Poor—small stones
Pond reservoir areas: Severe—slope

Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Bojo Variant—VIIe, nonirrigated; Schamp—VIIe, nonirrigated; Trunk—VIIb, nonirrigated
Range site: Bojo Variant—024X026N; Schamp—024X005N; Trunk—024X005N

1111—Yipor silt loam, sandy substratum

Map Unit Setting

Position on landscape: Stream terraces
Elevation: 3,800 to 4,200 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Yipor silt loam, sandy substratum, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—85 percent

Contrasting inclusions:
• Inclusion 1: Wholan silt loam, rarely flooded, 0 to 2 percent slopes—Typic Camborthents, fine-silty, mixed (calcareous), mesic—8 percent

• Inclusion 2: Bluewing very gravelly loam, 2 to 8 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—4 percent

• Inclusion 3: Yobe silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—2 percent

• Inclusion 4: Xeric Torriorthents silt loam, 0 to 2 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—1 percent

Characteristics of the Yipor Soil

Position on landscape: Stream terraces
Parent material: Mixed silt alluvium influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, shadscale, bud sagebrush

Typical profile
0 to 4 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline
Wildlife habitat elements

Suitability of the Yipor soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Yipor soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess salt
Daily cover for landfill: Fair—thin layer
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—flooding
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Erodos easily, excess salt
Terraces and diversions: Erodos easily

Interpretive Groups

Capability classification: Ilc, irrigated, and VIIc, nonirrigated
Range site: 024X003N

1112—Yipor silt loam

Map Unit Setting

Position on landscape: Stream terraces
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days

Composition

Major component:
• Yipor silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—90 percent

Contrasting inclusions:
• Inclusion 1: Whirlo gravelly very fine sandy loam, 0 to 2 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—10 percent

Characteristics of the Yipor Soil

Position on landscape: Stream terraces
Parent material: Mixed silty alluvium influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Black greasewood, shadcase, bottlebrush squarreltail
Typical profile

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 60 inches or more—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: Rare
Permeability: Moderate
Available water capacity: 9.7 to 11.5 inches
Water-supplying capacity: About 7 inches
Runoff: Ponded
Hydrologic group: B

Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: The smooth lower part of fan skirts adjacent to stream terraces
Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Yipor soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Yipor soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess salt
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—flooding
Roadfill: Good
Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Moderate—seeage
Embankments, dikes, and levees: Severe—piping, excess salt
Drainage: Deep to water
Irrigation: Erodes easily, excess salt
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: Ills, irrigated, and VII's, nonirrigated
Range site: 024X003N

1113—Yipor-Badland association

Map Unit Setting

Position on landscape: Lake plains
Elevation: 3,800 to 4,300 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 120 days

Composition

Major components:
- Yipor silt loam, warm, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—75 percent
- Badland—15 percent

Contrasting inclusions:
- Inclusion 1: Aeric Halaquepts silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Mazuma very fine sandy loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent

Characteristics of the Yipor Soil

Position on landscape: Lake plain terraces
Parent material: Mixed silty alluvium influenced by volcanic ash
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Black greasewood, shadscale, bottlebrush squirreltail

Typical profile

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—ML; estimated AASHTO classification—A-4

5 to 60 inches—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to
Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: Rare
Permeability: Moderate
Available water capacity: 9.7 to 11.5 inches
Water-supplying capacity: About 7 inches
Runoff: Ponded
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Badland

Position on landscape: Deeply dissected lake plain terraces
Slope features: Length—short; shape—concave to convex
Dominant present vegetation: Trace of black greasewood

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly concave lake plain terraces
Distinctive present vegetation: Basin wildrye

Inclusion 2
Position on landscape: Smooth lake plain terraces
Distinctive present vegetation: Bluegrass, shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Yipor soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Yipor soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess salt
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—flooding
Roadfill: Good
Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt
Drainage: Deep to water
Irrigation: Erodable easily, excess salt
Terraces and diversions: Erodable easily

Interpretive Groups

Capability classification: Yipor—IIIs, irrigated, and VIIIs, nonirrigated; Badland—VIIIE
Range site: Yipor—027X024N

1114—Yipor silt loam, occasionally flooded

Map Unit Setting

Position on landscape: Inset fans
Elevation: 3,800 to 4,300 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 100 days

Composition

Major component:
- Yipor silt loam, occasionally flooded, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—90 percent
Contrasting inclusions:
- Inclusion 1: Whirlo silt loam, 2 to 8 percent slopes—Typic Camborthids, loamy-skeletal, mixed, mesic—7 percent
- Inclusion 2: Playas—3 percent

Characteristics of the Yipor Soil

Position on landscape: Inset fans
Parent material: Mixed silty alluvium influenced by loess
Slope features: Length—long; shape—smooth
Dominant present vegetation: Sickle saltbush, shadscale

Typical profile

0 to 8 inches—silt loam; platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
8 to 36 inches—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—ML; estimated AASHTO classification—A-4
36 to 60 inches—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); slightly
sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: Frequency—occasional; duration—very brief; months—February through May
Permeability: Moderate
Available water capacity: 9.7 to 11.0 inches
Water-supplying capacity: About 7 inches
Runoff: Ponded
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Smooth fan skirts at the mouth of inset fans
Distinctive present vegetation: Shadscale, bud sagebrush

Inclusion 2
Position on landscape: Concave ponded areas
Distinctive present vegetation: Barren

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Yipor soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Yipor soil for selected uses and practices

Range seeding: Poor—too arid, excess sodium, excess salt
Daily cover for landfill: Good
Shallow excavations: Moderate—flooding
Local roads and streets: Severe—flooding
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Fair—thin layer, excess salt
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, excess salt

Drainage: Deep to water
Irrigation: Erodes easily, flooding
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: IIw, irrigated, and VIIw, nonirrigated
Range site: 024X012N

1121—Genegraff-Chilper-Blueewing association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 3,500 to 5,000 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Genegraff very gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—45 percent
- Chilper gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—25 percent
- Blueewing very gravelly loam, 0 to 2 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Typic Torriorthents cobbly loam, 15 to 30 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 2: Typic Torriorthents gravelly loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—3 percent
- Inclusion 3: Blueewing extremely stony loam, frequently flooded, 0 to 2 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—2 percent

Characteristics of the Genegraff Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, Bailey greasewood
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—67

Typical profile
0 to 6 inches—very gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 55 to 75
percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

6 to 24 inches—gravely clay loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—SC; estimated AASHTO classification—A-6

24 to 60 inches or more—very gravely sandy loam; 0 to 10 percent cobbles and stones and 40 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 4.6 to 6.4 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.17; T value—5; wind erodibility group—6
 Hazard of erosion: By water—slight; by wind—slight
 Shrink-swell potential: Moderate
 Corrosivity: To steel—high; to concrete—moderate
 Potential for frost action: Low

Characteristics of the Chilper Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—convex
 Dominant present vegetation: Shadscale, bud sagebrush
 Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—32

Typical profile

0 to 3 inches—gravely very fine sandy loam; 5 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-4

3 to 13 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

13 to 29 inches—clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

29 to 60 inches—extremely gravely sandy loam; 0 to 10 percent cobbles and stones and 75 to 90 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—GP, GP-GM, GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 5.1 to 6.6 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.37; T value—2; wind erodibility group—7
 Hazard of erosion: By water—slight; by wind—slight
 Shrink-swell potential: High
 Corrosivity: To steel—high; to concrete—high
 Potential for frost action: Low

Characteristics of the Bluewing Soil

Position on landscape: Inset fans
Parent material: Alluvium derived from mixed rock sources
Slope features: Length—long; shape—smooth
 Dominant present vegetation: Shadscale, bud sagebrush, Bailey greasewood
 Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—42

Typical profile

0 to 13 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A1, A-2

13 to 60 inches or more—stratified very gravelly sand to
extremely gravelly loamy coarse sand; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very rapid
Available water capacity: 1.9 to 3.1 inches
Water-supplying capacity: About 4 inches
Runoff: Very slow
Hydrologic group: A
Erosion factors (surface layer): K value—15; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Back slopes of fan piedmont remnants
Distinctive present vegetation: Bluegrass, shadscale

Inclusion 2
Position on landscape: Concave fan skirts adjacent to the lower part of fan piedmonts
Distinctive present vegetation: Black greasewood

Inclusion 3
Position on landscape: Terraces adjacent to narrow drainageways on inset fans
Distinctive present vegetation: Rubber rabbitbrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Genegraf soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Chilper soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor

Suitability of the Bluewing soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous

Ratings and restrictive features of the Genegraf soil for selected uses and practices

Range seeding: Poor—too arid, small stones, excess salt
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, excess salt
Pond reservoir areas: Moderate—slope
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium

Ratings and restrictive features of the Chilper soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—seepage, small stones
Shallow excavations: Moderate—too clayey
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Good
Sand: Improbable source—small stones
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, excess sodium
Pond reservoir areas: Moderate—slope
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium
Drainage: Deep to water
Irrigation: Percs slowly, slope, erodes easily
Terraces and diversions: Erodes easily

Ratings and restrictive features of the Bluewing soil for selected uses and practices

Range seeding: Poor—too arid, small stones, droughty
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty
Terraces and diversions: Large stones, too sandy
Interpretive Groups

Capability classification: Genegraf—VIIIs, nonirrigated; Chilper—Ve, irrigated, and VIIIs, nonirrigated; Bluewing—IVs, irrigated, and VIIIs, nonirrigated

Range site: Genegraf—027X030N; Chilper—027X028N; Bluewing—027X030N

1122—Genegraf-Trocken-Bluewing association

Map Unit Setting

Position on landscape: Fan piedmonts, fan skirts
Elevation: 3,800 to 4,500 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 120 days

Composition

Major components:
- Genegraf very gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natargids, fine-loamy, mixed, mesic—35 percent
- Trocken very gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—30 percent
- Bluewing very gravelly loamy sand, frequently flooded, 0 to 2 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Typic Torriorthents stony loam, 8 to 15 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—7 percent
- Inclusion 2: Bluewing stony loamy sand, frequently flooded, 4 to 8 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—4 percent
- Inclusion 3: Trocken extremely stony loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—4 percent

Characteristics of the Genegraf Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, Bailey greasewood
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—55

Typical profile

0 to 6 inches—very gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 55 to 75 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

6 to 24 inches—gravelly clay loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.8); moderately saline (8 to 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—SC; estimated AASHTO classification—A-6

24 to 60 inches or more—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 40 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 4.6 to 6.4 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.17; T value—5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Characteristics of the Trocken Soil

Position on landscape: Dissected fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—55

Typical profile

0 to 3 inches—very gravelly very fine sandy loam; 0 to 25 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2

3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobblely loam; 5 to 40 percent cobbles and stones and 60 to 85 percent pebbles
(by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 3.0 to 4.8 inches  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—high  
*Potential for frost action:* Low

**Characteristics of the Bluewing Soil**

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Spiny hopsage, rubber rabbitbrush, littleleaf horsebrush  
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—42

**Typical profile**

0 to 5 inches—very gravelly loamy sand; 10 to 25 percent cobbles and stones and 55 to 65 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP-SM; estimated AASHTO classification—A-1  
5 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand; 0 to 25 percent cobbles and stones and 65 to 80 percent pebbles (by weight); massive; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—frequent; duration—very brief; months—November through September  
*Permeability:* Very rapid  
*Available water capacity:* 1.9 to 3.1 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions**

**Inclusion 1**  
*Position on landscape:* The plane to concave lower part of fan skirts  
*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 2**  
*Position on landscape:* Slightly concave inset fans and drainageways  
*Distinctive present vegetation:* Shadscale, Bailey greasewood

**Inclusion 3**  
*Position on landscape:* Concave inset fans  
*Distinctive present vegetation:* Shadscale, bud sagebrush

**Major Uses**

*Current uses:* Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Genegraf soil for named elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Suitability of the Trocken soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Suitability of the Bluewing soil for named elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Ratings and restrictive features of the Genegraf soil for selected uses and practices**

*Range seeding:* Poor—too arid, small stones, excess salt  
*Daily cover for landfill:* Poor—small stones  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Topsoil:* Poor—small stones, area reclaim, excess sodium  
*Pond reservoir areas:* Moderate—slope  
*Embankments, dikes, and levees:* Severe—seepage, excess salt, excess sodium
Ratings and restrictive features of the Trocken soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, small stones
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—large stones
Roadfill: Fair—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Blueewing soil for selected uses and practices

Range seeding: Poor—too arid, droughty, small stones
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—flooding
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage

Interpretive Groups

Capability classification: Genegraf—VIls, nonirrigated;
Trocken—VIls, nonirrigated; Blueewing—VIIw, nonirrigated
Range site: Genegraf—027X030N; Trocken—
027X028N; Blueewing—027X022N

1130—Cleaver-Trocken-Blueewing association

Map Unit Setting

Position on landscape: Fan piedmonts, fan skirts
Elevation: 4,000 to 4,500 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 120 days

Composition

Major components:
• Cleaver gravelly loam, 2 to 4 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—55 percent
• Trocken gravelly very fine sandy loam, 4 to 15 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—15 percent
• Blueewing very gravelly loamy sand, frequently flooded, 2 to 4 percent slopes—Typic Torriorthents, sandy-
skeletal, mixed, mesic—15 percent

Contrasting inclusions:
• Inclusion 1: Genegraf gravelly sandy loam, 4 to 8 percent slopes—Duric Natargids, fine-loamy, mixed, mesic—6 percent
• Inclusion 2: Typic Natargids gravelly loam, 4 to 8 percent slopes—Typic Natargids, fine, montmorillonitic, mesic—6 percent
• Inclusion 3: Typic Natargids gravelly loam, 4 to 8 percent slopes—Typic Natargids, fine, montmorillonitic, mesic—3 percent

Characteristics of the Cleaver Soil

Position on landscape: Fan piedmonts
Parent material: Mixed alluvium derived from basic igneous rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, Indian ricegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—17

Typical profile

0 to 5 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4
5 to 17 inches—gravelly clay loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, CL; estimated AASHTO classification—A-6, A-7
17 to 24 inches—indurated duripan; extremely hard, extremely firm
24 to 60 inches—extremely gravelly coarse sandy loam; 10 to 25 percent cobbles and stones and 75 to 90 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the hardpan—slow; below the hardpan—moderately rapid
Available water capacity: 1.9 to 2.6 inches
Water-supplying capacity: About 5 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.20; T value—1; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Trocken Soil

Position on landscape: Dissected fan skirts
Parent material: Mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

Typical profile

0 to 13 inches—very gravelly loamy sand; 10 to 25 percent cobbles and stones and 55 to 65 percent pebbles (by weight); single grain; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP-SM; estimated AASHTO classification—A-1
13 to 60 inches—stratified very gravelly loamy sand to extremely gravelly loamy coarse sand; 0 to 25 percent cobbles and stones and 65 to 80 percent pebbles (by weight); massive; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobbly loam; 5 to 40 percent cobbles and stones and 60 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2, A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very rapid
Available water capacity: 1.9 to 3.1 inches
Water-supplying capacity: About 5 inches
Runoff: Slow
Hydrologic group: A
Erosion factors (surface layer): K value—.10; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex fan aprons
Distinctive present vegetation: Greasewood, bud sagebrush

Inclusion 2
Position on landscape: The convex upper part of erosional fan piedmont remnants
Distinctive present vegetation: Shadscale, bud sagebrush

Inclusion 3
Position on landscape: The convex upper part of fan piedmont remnants
Distinctive present vegetation: Shadscale, bud sagebrush
Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Cleaver soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Trocken soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Bluewing soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Cleaver soil for selected uses and practices

Range seeding: Poor—too arid, droughty
Daily cover for landfill: Poor—cemented pan, small stones, too sandy
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan
Roadfill: Poor—cemented pan
Sand: Improbable source—small stones
Gravel: Probable source
Topsoil: Poor—cemented pan, small stones, area reclaim
Pond reservoir areas: Severe—cemented pan
Embankments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the Trocken soil for selected uses and practices

Range seeding: Poor—too arid, too crusty
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—slope, large stones
Roadfill: Fair—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Bluewing soil for selected uses and practices

Range seeding: Poor—too arid, droughty, small stones
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—flooding
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage

Interpretive Groups

Capability classification: Cleaver—VII, nonirrigated; Trocken—VII, nonirrigated; Bluewing—VII, nonirrigated
Range site: Cleaver—027X028N; Trocken—027X028N; Bluewing—027X022N

1140—Layview, very steep-Tusel-Layview association

Map Unit Setting

Position on landscape: Mountains
Elevation: 7,000 to 9,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 70 days

Composition

Major components:
- Layview very gravelly loam, 50 to 75 percent slopes—Argic Lithic Cryoborolls, loamy-skeletal, mixed—35 percent
- Tusel very cobbly loam, 50 to 75 percent slopes—Argic Pachic Cryoborolls, loamy-skeletal, mixed—30 percent
- Layview very gravelly loam, 4 to 15 percent slopes—Argic Lithic Cryoborolls, loamy-skeletal, mixed—20 percent

Contrasting inclusions:
- Inclusion 1: Iver gravelly silt loam, 50 to 75 percent slopes—Pachic Haploxerolls, coarse-loamy, mixed, frigid—5 percent
- Inclusion 2: Spinlin very gravelly loam, 30 to 50 percent slopes—Argic Cryoborolls, clayey-skeletal, montmorillonitic—4 percent
- Inclusion 3: Rock outcrop and rubble land—4 percent
- Inclusion 4: Pachic Cryoborolls silt loam, 30 to 50 percent slopes—Pachic Cryoborolls, loamy-skeletal, mixed—2 percent

Characteristics of the Very Steep Layview Soil

Position on landscape: South- and west-facing side slopes of mountains
Parent material: Kind—residuum; source—andesite, rhyolite, tuff, other volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, bluebunch wheatgrass, Idaho fescue
Pershing County, Nevada, East Part

Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—80

Typical profile

0 to 7 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

7 to 14 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 45 to 70 percent pebbles (by weight); massive; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 40 to 60 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Moderately slow

Available water capacity: 1.0 to 1.4 inches

Water-supplying capacity: About 9 inches

Runoff: Very rapid

Hydrologic group: D

Erosion factors (surface layer): K value—10; T value—1; wind erodibility group—7

Hazard of erosion: By water—moderate; by wind—slight

Shrink-swell potential: Low

Corrosivity: To steel—moderate; to concrete—low

Potential for frost action: Moderate

Characteristics of the Strongly Sloping Layview Soil

Position on landscape: Crests of mountains

Parent material: Kind—residuum; source—andesite, rhyolite, tuff, other volcanic rocks

Slope features: Length—short; shape—concave

Dominant present vegetation: Low sagebrush, Idaho fescue, black sagebrush

Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—80

Typical profile

0 to 7 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM, GM-GC, SM-SC; estimated AASHTO classification—A-2, A-4

19 to 42 inches—very gravelly clay loam; 15 to 45 percent cobbles and stones and 60 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

42 inches—unweathered bedrock

Characteristics of the Tusel Soil

Position on landscape: North- and east-facing side slopes of mountains

Parent material: Kind—residuum; source—chert, shale, quartzite, other volcanic rocks

Slope features: Length—long; shape—concave

Dominant present vegetation: Mountain big sagebrush, mountain brome, Idaho fescue

Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—40
classification—GC; estimated AASHTO
classification—A-2, A-6
14 inches—unweathered bedrock

Soil and water features

*Depth to bedrock:* 10 to 14 inches
*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Moderately slow
*Available water capacity:* 1.0 to 1.4 inches
*Water-supplying capacity:* About 10 inches
*Runoff:* Medium
*Hydrologic group:* D
*Erosion factors (surface layer):* K value—10; T value—1; wind erodibility group—7
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* Low
*Corrosivity:* To steel—moderate; to concrete—low
*Potential for frost action:* Moderate

Contrasting Inclusions

**Inclusion 1**
*Position on landscape:* Concave, south- and west-facing side slopes of mountains
*Distinctive present vegetation:* Idaho fescue, mountain big sagebrush

**Inclusion 2**
*Position on landscape:* The convex lower part of south- and west-facing side slopes on mountains
*Distinctive present vegetation:* Idaho fescue, low sagebrush

**Inclusion 3**
*Position on landscape:* The crests and upper side slopes of mountains
*Distinctive present vegetation:* Barren

**Inclusion 4**
*Position on landscape:* Concave, north- and east-facing side slopes of mountains
*Distinctive present vegetation:* Letterman needlegrass, tailcup lupine

Major Uses

*Current uses:* Wildlife habitat, rangeland

Wildlife habitat elements

*Suitability of the very steep Layview soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
*Suitability of the sloping Tusel soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
*Suitability of the strongly sloping Layview soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the very steep Layview soil for selected uses and practices**

*Range seeding:* Poor—droughty, small stones
*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope
*Shallow excavations:* Severe—depth to bedrock, slope
*Local roads and streets:* Severe—depth to bedrock, slope
*Roadfill:* Poor—depth to bedrock, slope
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—depth to bedrock, small stones, slope
*Pond reservoir areas:* Severe—depth to bedrock, slope
*Embankments, dikes, and levees:* Severe—thin layer

**Ratings and restrictive features of the Tusel soil for selected uses and practices**

*Range seeding:* Poor—small stones, erodes easily
*Daily cover for landfill:* Poor—slope, small stones
*Shallow excavations:* Severe—slope, large stones
*Local roads and streets:* Severe—slope, large stones
*Roadfill:* Poor—slope, large stones
*Topsoil:* Poor—small stones, slope
*Pond reservoir areas:* Severe—slope
*Embankments, dikes, and levees:* Severe—large stones

**Ratings and restrictive features of the strongly sloping Layview soil for selected uses and practices**

*Range seeding:* Poor—droughty, small stones
*Daily cover for landfill:* Poor—depth to bedrock, small stones
*Shallow excavations:* Severe—depth to bedrock
*Local roads and streets:* Severe—depth to bedrock
*Roadfill:* Poor—depth to bedrock
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—depth to bedrock, small stones
*Pond reservoir areas:* Severe—depth to bedrock, slope
*Embankments, dikes, and levees:* Severe—thin layer

Interpretive Groups

*Capability classification:* Layview, very steep—VIIs, nonirrigated; Tusel—VIIs, nonirrigated; Layview, strongly sloping—VIIs, nonirrigated
*Range site:* Layview, very steep—024X027N; Tusel—024X032N; Layview, strongly sloping—024X016N

1160—Slaw-Ragtown association

Map Unit Setting

*Position on landscape:* Lake plains
*Elevation:* 3,600 to 3,800 feet
Average annual precipitation: About 5 inches  
Average annual air temperature: About 52 degrees F  
Frost-free period: About 120 days

**Composition**

**Major components:**
- Slaw silt loam, 0 to 2 percent slopes—Typic  
  Torrifuvents, fine-silty, mixed (calcareous), mesic—65 percent  
- Ragtown fine sandy loam, 0 to 2 percent slopes— 
  Typic Torrifuvents, fine, montmorillonitic (calcareous), mesic—25 percent  
**Contrasting inclusions:**
- Inclusion 1: Aeric Halaquepts silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent  
- Inclusion 2: Aeric Halaquepts silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine, montmorillonitic (calcareous), mesic—5 percent

**Characteristics of the Slaw Soils**

**Position on landscape:** The upper part of lake plains  
**Parent material:** Mixed alluvium  
**Slope features:** Length—long; shape—smooth  
**Dominant present vegetation:** Black greasewood, Torrey quailbush, shadscale, inland saltgrass

**Typical profile**

0 to 3 inches—silt loam; platy structure; soft, friable; strongly alkaline (pH 9.0); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
3 to 60 inches—stratified very fine sandy loam to silty clay; massive; hard, friable; very strongly alkaline (pH 9.2); strongly saline (more than 16 mmhos/cm); nonsodic (SAR more than 46); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches  
**Flooding:** None  
**Permeability:** Slow  
**Available water capacity:** 9.5 to 11.1 inches  
**Water-supplying capacity:** About 4 inches  
**Runoff:** Very slow  
**Hydrologic group:** C  
**Erosion factors (surface layer):** K value—.37; T value—5; wind erodibility group—3  
**Hazard of erosion:** By water—slight; by wind—slight  
**Shrink-swell potential:** High  
**Corrosivity:** To water—high; to wind—high  
**Potential for frost action:** Low

**Potential for frost action:** Low

**Characteristics of the Ragtown Soil**

**Position on landscape:** Lake plain terraces  
**Parent material:** Lacustrine sediments  
**Slope features:** Length—long; shape—smooth  
**Dominant present vegetation:** Black greasewood, shadscale, seepweed

**Typical profile**

0 to 7 inches—fine sandy loam; 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
7 to 20 inches—silty clay loam; massive; slightly hard, friable; very strongly alkaline (pH 9.2); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7  
20 to 60 inches—stratified silty clay loam to clay; massive; slightly hard, friable; strongly alkaline (pH 9.0); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—CL, CH, MH; estimated AASHTO classification—A-7

**Soil and water features**

**Depth to a seasonal high water table:** More than 60 inches  
**Flooding:** None  
**Permeability:** Slow  
**Available water capacity:** 9.5 to 11.1 inches  
**Water-supplying capacity:** About 4 inches  
**Runoff:** Very slow  
**Hydrologic group:** C  
**Erosion factors (surface layer):** K value—.37; T value—5; wind erodibility group—3  
**Hazard of erosion:** By water—slight; by wind—slight  
**Shrink-swell potential:** High  
**Corrosivity:** To water—high; to wind—high  
**Potential for frost action:** Low

**Contrasting Inclusions**

**Inclusion 1**

**Position on landscape:** Smooth lake plain terraces  
**Distinctive present vegetation:** Inland saltgrass, black greasewood

**Inclusion 2**

**Position on landscape:** Smooth lake plain terraces  
**Distinctive present vegetation:** Basin wildrye, Torrey quailbush
**Major Uses**

**Current uses**: Rangeland, wildlife habitat

**Wildlife habitat elements**

- Suitability of the Slaw soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
- Suitability of the Ragtown soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Ratings and restrictive features of the Slaw soil for selected uses and practices**

- Range seeding: Poor—too arid, excess salt, excess sodium
- Daily cover for landfill: Good
- Shallow excavations: Moderate—flooding
- Local roads and streets: Severe—low strength, flooding
- Roadfill: Poor—low strength
- Sand: Improbable source—excess fines
- Gravel: Improbable source—excess fines
- Topsoil: Poor—excess salt
- Pond reservoir areas: Slight
- Embankments, dikes, and levees: Severe—excess salt
- Drainage: Deep to water
- Irrigation: Percs slowly, erodes easily
- Terraces and diversions: Erodes easily, percs slowly

**Ratings and restrictive features of the Ragtown soil for selected uses and practices**

- Range seeding: Poor—too arid, excess salt, excess sodium
- Daily cover for landfill: Poor—hard to pack
- Shallow excavations: Moderate—too clayey
- Local roads and streets: Severe—low strength, shrink-swell
- Roadfill: Poor—low strength, shrink-swell
- Sand: Improbable source—excess fines
- Gravel: Improbable source—excess fines
- Topsoil: Poor—excess salt, excess sodium, too clayey
- Pond reservoir areas: Slight
- Embankments, dikes, and levees: Severe—excess salt, excess sodium, hard to pack

**Interpretive Groups**

- Capability classification: Slaw—Illw, irrigated, and VlIs, nonirrigated; Ragtown—Vlls, nonirrigated
- Range site: Slaw—027X041N; Ragtown—027X025N

**1200—Bluewing, moderately steep-Bluewing-Daick association**

**Map Unit Setting**

- Position on landscape: Fan piedmonts, hills
- Elevation: 4,000 to 5,000 feet
- Average annual precipitation: About 6 inches
- Average annual air temperature: About 49 degrees F
- Frost-free period: About 110 days

**Composition**

- Major components:
  - Bluewing very gravely sandy loam, 15 to 30 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—40 percent
  - Bluewing very gravely sandy loam, 4 to 15 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—25 percent
  - Daick gravelly clay, 30 to 50 percent slopes—Typic Torriorthents, clayey, montmorillonitic (calcareous), mesic, shallow—20 percent

- Contrasting inclusions:
  - Inclusion 1: Bluewing very gravelly silt loam, rarely flooded, 0 to 2 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—7 percent
  - Inclusion 2: Rock outcrop—6 percent
  - Inclusion 3: Xeric Torriorthents cobbly sandy loam, 0 to 2 percent slopes—Xeric Torriorthents, sandy-skeletal, mixed, mesic—1 percent
  - Inclusion 4: Typic Torriorthents silt loam, 2 to 8 percent slopes—Typic Torriorthents, fine-loamy, mixed (calcareous), mesic—1 percent

**Characteristics of the Moderately Steep Bluewing Soil**

- Position on landscape: Fan piedmont remnants
- Parent material: Sandy alluvium derived from mixed rock sources
- Slope features: Length—long; shape—convex
- Dominant present vegetation: Shadscale, Bailey greasewood, Indian ricegrass, bottlebrush squirreltail
- Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—42%

**Typical profile**

- 0 to 5 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); puffy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1
5 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand: 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); massive; loose; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated
Unified classification—GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very rapid
Available water capacity: 1.9 to 3.1 inches
Water-supplying capacity: About 5 inches
Runoff: Rapid
Hydrologic group: A
Erosion factors (surface layer): K value—.10; T value—
5; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Daick Soil

Position on landscape: Side slopes of hills
Parent material: Kind—residuum; source—tuffaceous rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, Bailey greasewood, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—27

Typical profile

0 to 4 inches—gravelly clay; 0 to 5 percent cobbles and stones and 25 to 40 percent pebbles (by weight);
platy structure; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CH, CL, GC; estimated AASHTO classification—A-7

4 inches—weathered bedrock

Soil and water features

Depth to bedrock: 4 to 14 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 0.5 to 0.6 inch
Water-supplying capacity: About 4 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.17; T value—
1; wind erodibility group—5
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Strongly Sloping Bluewing Soil

Position on landscape: Remnants of inset fans
Parent material: Sandy alluvium derived from mixed rock sources
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, Bailey greasewood, Indian ricegrass, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—42

Typical profile

0 to 5 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

5 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand: 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); massive; loose; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1
Contrasting Inclusions

Inclusion 1
Position on landscape: The concave central parts of inset fans
Distinctive present vegetation: Shadscale, Bailey greasewood

Inclusion 2
Position on landscape: Hillsides, hilltops
Distinctive present vegetation: Barren

Inclusion 3
Position on landscape: Concave inset fans adjacent to drainageways
Distinctive present vegetation: Wyoming big sagebrush

Inclusion 4
Position on landscape: Outer margins of inset fans adjacent to foot slopes of fan piedmont remnants
Distinctive present vegetation: Black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the moderately steep Bluewing soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the strongly sloping Bluewing soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Daick soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the moderately steep Bluewing soil for selected uses and practices

Range seeding: Poor—too arid, small stones, droughty
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—slope
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage, slope
Drainage: Deep to water
Irrigation: Droughty, slope
Terraces and diversions: Slope, large stones, too sandy

Ratings and restrictive features of the Daick soil for selected uses and practices

Range seeding: Poor—too arid, droughty, depth to bedrock
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, too clayey, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embarkments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Bluewing, moderately steep—VII, nonirrigated; Bluewing, strongly sloping—IV, irrigated, and VII, nonirrigated; Daick—VII, nonirrigated

Range site: Bluewing, moderately steep—027X018N; Bluewing, strongly sloping—027X018N; Daick—027X027N

1201—Bluewing gravelly sandy loam, 2 to 8 percent slopes

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 3,500 to 5,000 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 52 degrees F
Frost-free period: About 120 days

Composition

Major component:
• Bluewing gravelly sandy loam, 2 to 8 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—90 percent
Contrasting inclusions:
- Inclusion 1: Mazuma fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 2: Swingler silt loam, clayey substratum, strongly saline-sodic, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent

Characteristics of the Bluewing Soil

Position on landscape: Inset fans
Parent material: Sandy alluvium derived from mixed rock sources
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, Bailey greasewood, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—30

Typical profile
0 to 5 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
5 to 60 inches—stratified gravelly sand to extremely gravelly loamy coarse sand; 5 to 25 percent cobbles and stones and 65 to 75 percent pebbles (by weight); massive; loose; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very rapid
Available water capacity: 1.9 to 3.1 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: A
Erosion factors (surface layer): K value—.24; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Distinctive present vegetation: Bluegrass, shadscale

Inclusion 2
Position on landscape: Smooth remnants of lake plain terraces adjacent to the lower part of fan piedments
Distinctive present vegetation: Black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Bluewing soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Bluewing soil for selected uses and practices

Range seeding: Poor—too arid, small stones, droughty
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—seepage, cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage
Drainage: Deep to water
Irrigation: Droughty, slope
Terraces and diversions: Slope, large stones, too sandy

Interpretive Groups

Capability classification: IVs, irrigated, and VII, nonirrigated
Range site: 027X018N

1210—Daick-Rezave-Rubble land association

Map Unit Setting

Position on landscape: Foothills
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 120 days

Composition

Major components:
- Daick gravelly clay loam, 30 to 50 percent slopes—Typic Torriorthents, clayey, montmorillonitic (calcareous), mesic, shallow—35 percent
- Rezave extremely stony very fine sandy loam, 30 to
50 percent slopes—Lithic Natrargids, clayey, montmorillonitic, mesic—25 percent
  • Rubble land—25 percent

Contrasting inclusions:
  • Inclusion 1: Typic Natrargids very cobbly loam, 4 to 15 percent slopes—Typic Natrargids, fine, montmorillonitic, mesic—8 percent
  • Inclusion 2: Typic Natrargids very cobbly loam, 30 to 50 percent slopes—Typic Natrargids, loamy-skeletal, mixed, mesic—4 percent
  • Inclusion 3: Typic Torriorthents gravelly sandy loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—3 percent

Characteristics of the Daick Soil

Position on landscape: Side slopes of foothills

Parent material: Kind—residuum; source—tuffaceous rocks

Slope features: Length—long; shape—concave

Dominant present vegetation: Shadscale, bud sagebrush, Bailey greasewood, bottlebrush squirreltail

Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—27

Typical profile

0 to 4 inches—gravelly clay; 0 to 5 percent cobbles and stones; 25 to 40 percent pebbles (by weight); platy structure; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification— CL, GC; estimated AASHTO classification—A-7

4 inches—weathered bedrock

Soil and water features

Depth to bedrock: 4 to 14 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Slow

Available water capacity: 0.5 to 0.6 inch

Water-supplying capacity: About 4 inches

Runoff: Very rapid

Hydrologic group: D

Erosion factors (surface layer): K value—.20; T value—1; wind erodibility group—7

Hazard of erosion: By water—severe; by wind—slight

Shrink-swell potential: High

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Low

Characteristics of the Rezave Soil

Position on landscape: The shoulder slopes and upper side slopes of foothills

Parent material: Kind—residuum; source—tuffaceous rocks

Slope features: Length—long; shape—convex

Dominant present vegetation: Shadscale, rabbitbrush, bottlebrush squirreltail

Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—55

Typical profile

0 to 3 inches—extremely stony very fine sandy loam; 35 to 45 percent cobbles and stones; 5 to 15 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

3 to 14 inches—stony clay; 5 to 30 percent cobbles and stones; 0 to 10 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

14 to 16 inches—stony clay loam; 5 to 10 percent cobbles and stones; 30 to 50 percent pebbles (by weight); massive; hard, firm; very strongly alkaline (pH 9.2); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SC, CL; estimated AASHTO classification—A-7

16 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 14 to 20 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Slow

Available water capacity: 1.7 to 2.1 inches

Water-supplying capacity: About 5 inches

Runoff: Rapid

Hydrologic group: D

Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—8

Hazard of erosion: By water—severe; by wind—slight

Shrink-swell potential: High

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Low

Characteristics of the Rubble Land

Position on landscape: Crests, shoulder slopes, and back slopes of foothills

Dominant present vegetation: Barren
Contrasting Inclusions

Inclusion 1
Position on landscape: Convex crests of foothills
Distinctive present vegetation: Bluegrass, shadscale

Inclusion 2
Position on landscape: Concave side slopes of foothills
Distinctive present vegetation: Bluegrass, shadscale

Inclusion 3
Position on landscape: Concave toe slopes adjacent to drainageways
Distinctive present vegetation: Indian ricegrass, Bailey greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements
Suitability of the Daick soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Rezave soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Daick soil for selected uses and practices
Range seeding: Poor—too arid, droughty, depth to bedrock
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Rezave soil for selected uses and practices
Range seeding: Poor—too arid, droughty, excess sodium
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, large stones, too clayey
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—excess sodium

Interpretive Groups
Capability classification: Daick—VIIa, nonirrigated; Rezave—VIIa, nonirrigated; Rubble land—VIIIa
Range site: Daick—027X027N; Rezave—027X030N

1230—Knott-Sodhouse-Wholan association

Map Unit Setting
Position on landscape: Fan piedmonts
Elevation: 4,500 to 5,500 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition
Major components:
- Knott gravelly very fine sandy loam, 8 to 15 percent slopes—Typic Nadurargids, clayey, montmorillonitic, mesic, shallow—45 percent
- Sodhouse gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Durorthids, loamy, mixed, mesic, shallow—25 percent
- Wholan silt loam, rarely flooded, 0 to 2 percent slopes—Typic Camborthids, coarse-silty, mixed, mesic—15 percent
Contrasting inclusions:
- Inclusion 1: Cortez gravelly very fine sandy loam, 2 to 8 percent slopes—Xerolic Nadurargids, fine, montmorillonitic, mesic—10 percent
- Inclusion 2: Oxxorel gravelly very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—5 percent

Characteristics of the Knott Soil
Position on landscape: Side slopes of fan piedmont remnants
Parent material: Mixed alluvium and loess high in content of volcanic ash
Slope features: Length—long; shape—concave
Dominant present vegetation: Shadscale, bus sagebrush, bottlebrush, squiretail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—26

Typical profile
0 to 4 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
4 to 18 inches—clay; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); prismatic
structure; hard, firm; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7
18 to 34 inches—indurated layer; massive; extremely hard, extremely firm
34 to 60 inches—very gravelly coarse sandy loam; 5 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—slow; below the duripan—moderately rapid
Available water capacity: 2.4 to 3.0 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Sodhouse Soil

Position on landscape: Summits of fan piedmont remnants
Parent material: Mixed alluvium, loess, and volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel; percentage of surface covered—8

Typical profile

0 to 2 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
2 to 14 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
14 to 29 inches—indurated layer; massive; extremely hard, extremely firm
29 to 60 inches—extremely gravelly sandy loam; 5 to 20 percent cobbles and stones and 70 to 85 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—moderate; below the duripan—moderately rapid
Available water capacity: 1.5 to 2.2 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.32; T value—1; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Wholan Soil

Position on landscape: Fan skirts
Parent material: Loess over siltly alluvium derived from mixed rock sources
Slope features: Length—long; shape—concave
Dominant present vegetation: Shadscale, bud sagebrush

Typical profile

0 to 5 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 7.9); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
5 to 60 inches—silt loam; massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: Rare
Permeability: Moderate
Available water capacity: 9.7 to 10.9 inches
Water-supplying capacity: About 7 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—5
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Summits of fan piedmont remnants
Distinctive present vegetation: Wyoming big sagebrush, Thurber needlegrass

Inclusion 2
Position on landscape: Summits of fan piedmont remnants
Distinctive present vegetation: Shadscale, bottlebrush squirreltail

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Knott soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Sodhouse soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Wholan soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Knott soil for selected uses and practices

Range seeding: Poor—too arid, droughty, excess salt
Daily cover for landfill: Poor—cemented pan, small stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan, low strength
Roadfill: Poor—cemented pan
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan, small stones
Pond reservoir areas: Severe—seepage, cemented pan, slope

Embankments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the Sodhouse soil for selected uses and practices

Range seeding: Poor—too arid, droughty, small stones
Daily cover for landfill: Poor—cemented pan, seepage, small stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan
Roadfill: Poor—cemented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—cemented pan, small stones, area reclaim
Pond reservoir areas: Severe—cemented pan, seepage
Embankments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the Wholan soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, too crusty
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—flooding
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Erodes easily
Terraces and diversions: Erodes easily

Interpretive Groups

Capability classification: Knott—VII, nonirrigated; Sodhouse—VII, nonirrigated; Wholan—I, irrigated, and VII, nonirrigated
Range site: Knott—024X002N; Sodhouse—024X002N; Wholan—024X002N

1231—Knott-Sodhouse-Cortez association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 5,000 to 5,200 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
• Knott gravelly very fine sandy loam, 8 to 15 percent
slopes—Typic Nadurargids, clayey, montmorillonitic, mesic, shallow—45 percent
  • Sodhouse gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Durorthids, loamy, mixed, mesic, shallow—20 percent
  • Cortez gravelly very fine sandy loam, 2 to 8 percent slopes—Xerolic Nadurargids, fine, montmorillonitic, mesic—20 percent
Contrasting inclusions:
  • Inclusion 1: Xeric Torriorthents cobbly loam, rarely flooded, 2 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcaceous), mesic—5 percent
  • Inclusion 2: Xerotic Torriorthents loam, 2 to 8 percent slopes—Xerotic Torriorthents, coarse-loamy, mixed (calcaceous), mesic—5 percent
  • Inclusion 3: Xeric Torriorthents gravelly very fine sandy loam, 15 to 30 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcaceous), mesic—5 percent

Characteristics of the Knott Soil

Position on landscape: Side slopes of fan piedmont remnants
Parent material: Mixed alluvium and loess high in content of volcanic ash
Slope features: Length—long; shape—concave
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—26

Typical profile

0 to 4 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
4 to 18 inches—clay; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7
18 to 34 inches—indurated layer; massive; extremely hard, extremely firm
34 to 60 inches—very gravelly coarse sandy loam; 5 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—slow; below the duripan—moderately rapid
Available water capacity: 2.4 to 3.0 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Sodhouse Soil

Position on landscape: Summits of the mid and lower fan piedmont remnants
Parent material: Mixed alluvium and loess
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel; percentage of surface covered—8

Typical profile

0 to 2 inches—gravelly very fine sandy loam; 0 to 10 percent cobbles and stones and 35 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
2 to 14 inches—very fine sandy loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
14 to 29 inches—indurated layer; massive; extremely hard, extremely firm
29 to 60 inches—extremely gravelly sandy loam; 5 to 20 percent cobbles and stones and 70 to 85 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1
Soil and water features

Depth to a hardpan: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—moderate; below the duripan—moderately rapid
Available water capacity: 1.5 to 2.2 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.32; T value—2; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Moderate

Characteristics of the Cortez Soil

Position on landscape: Summits of fan piedmont remnants
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—22

Typical profile

0 to 8 inches—gravely very fine sandy loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, ML; estimated AASHTO classification—A-4
8 to 33 inches—clay; 15 to 25 percent pebbles (by weight); prismatic structure; hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—CH; estimated AASHTO classification—A-7
33 to 46 inches—indurated layer; massive; extremely hard, extremely firm
46 to 60 inches—very cobbly coarse sandy loam; 15 to 50 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.5); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 22 to 36 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—very slow; below the duripan—rapid
Available water capacity: 4.7 to 5.7 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.32; T value—1; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Concave inset fans
Distinctive present vegetation: Bottlebrush squirreltail, Wyoming big sagebrush

Inclusion 2
Position on landscape: Concave inset fans
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Inclusion 3
Position on landscape: Plane and slightly concave side slopes of fan piedmont remnants
Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Knott soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Sodhouse soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Cortez soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Knott soil for selected uses and practices

Range seeding: Poor—too arid, droughty, excess salt
Daily cover for landfill: Poor—cemented pan, small stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan, low strength
Roadfill: Poor—cemented pan
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan, small stones
Pond reservoir areas: Severe—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the Sodhouse soil for selected uses and practices
Range seeding: Poor—too arid, droughty, small stones
Daily cover for landfill: Poor—cemented pan, seepage, small stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan
Roadfill: Poor—cemented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—cemented pan, small stones, area reclaim
Pond reservoir areas: Severe—cemented pan, seepage
Embarkments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the Cortez soil for selected uses and practices
Range seeding: Poor—excess sodium, too crusty
Daily cover for landfill: Poor—cemented pan, hard to pack
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Poor—cemented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Moderate—seepage, cemented pan, slope
Embarkments, dikes, and levees: Severe—hard to pack, excess salt
Drainage: Deep to water
Irrigation: Percs slowly, cemented pan, slope
Terraces and diversions: Large stones, cemented pan

Interpretive Groups
Capability classification: Knott—VIIa, nonirrigated; Sodhouse—VIIa, nonirrigated; Cortez—IVe, irrigated, and VIs, nonirrigated
Range site: Knott—024X002N; Sodhouse—024X002N; Cortez—024X005N

1232—Knott, moderately steep-Snapp-Knott association

Map Unit Setting
Position on landscape: Ballenas
Elevation: 4,500 to 5,000 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition
Major components:
• Knott cobbly very fine sandy loam, 15 to 30 percent slopes—Typic Nadurargids, clayey, montmorillonitic, mesic, shallow—50 percent
• Snapp cobbly very fine sandy loam, 15 to 30 percent slopes—Durixerollic Natrargids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—20 percent
• Knott cobbly very fine sandy loam, 2 to 8 percent slopes—Typic Nadurargids, clayey, montmorillonitic, mesic, shallow—15 percent

Contrasting inclusions:
• Inclusion 1: Cortez cobbly very fine sandy loam, 2 to 8 percent slopes—Xerolic Nadurargids, fine, montmorillonitic, mesic—8 percent
• Inclusion 2: Sodhouse cobbly very fine sandy loam, 4 to 15 percent slopes—Typic Durothids, loamy, mixed, mesic, shallow—5 percent
• Inclusion 3: Trocken Variant cobbly loam, rarely flooded, 2 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—2 percent

Characteristics of the Moderately Steep Knott Soil

Position on landscape: South-facing side slopes of partial ballenas
Parent material: Mixed alluvium and loess high in content of volcanic ash
Slope features: Length—long; shape—plane
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—26

Typical profile
0 to 4 inches—cobbly very fine sandy loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4
4 to 18 inches—clay; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6);
slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7
18 to 34 inches—indurated layer; massive; extremely hard, extremely firm
34 to 60 inches—very gravelly coarse sandy loam; 5 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

*Depth to a hardpan:* 10 to 20 inches

*Depth to a seasonal high water table:* More than 60 inches

*Flooding:* None

*Permeability:* Above the duripan—slow; below the duripan—moderately rapid

*Available water capacity:* 2.4 to 3.0 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential for frost action:* Low

**Characteristics of the Snapp Soil**

*Position on landscape:* North-facing side slopes of partial ballenas

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—plane

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass, bottlebrush squirreltail

*Rock fragments on the surface:* Kind—gravel, cobbles; percentage of surface covered—30

**Typical profile**

0 to 9 inches—cobbly very fine sandy loam; 30 to 40 percent cobbles and stones and 15 to 30 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

9 to 28 inches—gravelly clay loam; 25 to 50 percent pebbles (by weight); prismatic structure; hard, firm; very strongly alkaline (pH 9.6); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CH, GC; estimated AASHTO classification—A-7

28 to 39 inches—gravelly clay loam; 25 to 50 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL GC; estimated AASHTO classification—A-6, A-7

39 to 60 inches or more—very gravelly loamy sand; 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GP—GM, GM, SP—SM, SM; estimated AASHTO classification—A-1

Soil and water features

*Depth to a seasonal high water table:* More than 60 inches

*Flooding:* None

*Permeability:* Slow

*Available water capacity:* 5.6 to 7.4 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—3; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* To steel—high; to concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Moderately Sloping Knott Soil**

*Position on landscape:* Crests of ballenas

*Parent material:* Mixed alluvium and loess high in content of volcanic ash

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail

*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—26

**Typical profile**

0 to 4 inches—cobbly very fine sandy loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

4 to 18 inches—clay; 0 to 5 percent cobbles and stones and 10 to 25 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7
18 to 34 inches—indurated layer; massive; extremely hard, extremely firm
34 to 60 inches—very gravelly coarse sandy loam; 5 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 10 to 20 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Above the duripan—slow; below the duripan—moderately rapid

Available water capacity: 2.4 to 3.0 inches

Water-supplying capacity: About 6 inches

Runoff: Medium

Hydrologic group: D

Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—4

Hazard of erosion: By water—slight; by wind—slight

Shrink-swell potential: High

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Low

Contrasting Inclusions

Inclusion 1

Position on landscape: Convex relict summit areas at the upper ends of ballenas

Distinctive present vegetation: Thruber needlegrass, Wyoming big sagebrush

Inclusion 2

Position on landscape: Convex crests and shoulder slopes of ballenas

Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

Inclusion 3

Position on landscape: Channels between ballenas

Distinctive present vegetation: Thruber needlegrass, spiny hopsage, Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the moderately steep Knott soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Snapp soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the moderately sloping Knott soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the moderately steep Knott soil for selected uses and practices

Range seeding: Poor—too arid, droughty, excess salt

Daily cover for landfill: Poor—cemented pan, small stones, slope

Shallow excavations: Severe—cemented pan, cutbanks cave, slope

Local roads and streets: Severe—cemented pan, cutbanks cave, slope

Roadfill: Poor—cemented pan

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Topsoil: Poor—cemented pan, small stones, slope

Pond reservoir areas: Severe—seepage, cemented pan, slope

Embankments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the Snapp soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too crusty

Daily cover for landfill: Poor—seepage, small stones, slope

Shallow excavations: Severe—cutbanks cave, slope

Local roads and streets: Severe—slope

Roadfill: Fair—slope

Sand: Probable source

Gravel: Probable source

Topsoil: Poor—small stones, area reclaim, excess sodium

Pond reservoir areas: Severe—seepage, slope

Embankments, dikes, and levees: Severe—seepage, excess sodium

Ratings and restrictive features of the moderately sloping Knott soil for selected uses and practices

Range seeding: Poor—too arid, droughty, excess salt

Daily cover for landfill: Poor—cemented pan, small stones

Shallow excavations: Severe—cemented pan, cutbanks cave

Local roads and streets: Severe—cemented pan, low strength

Roadfill: Poor—cemented pan

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Topsoil: Poor—cemented pan, small stones

Pond reservoir areas: Severe—seepage, cemented pan

Embankments, dikes, and levees: Severe—seepage
Interpretive Groups

Capability classification: Knott, moderately steep—VIIe, nonirrigated; Snapp—VIIa, nonirrigated; Knott, moderately sloping—VIIa, nonirrigated

Range site: Knott, moderately steep—024X002N; Snapp—024X005N; Knott, moderately sloping—024X002N

1270—Gol-Say association

Map Unit Setting

Position on landscape: Mountains
Elevation: 5,500 to 7,000 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 44 degrees F
Frost-free period: About 90 days

Composition

Major components:
- Gol very cobbly sandy loam, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid, shallow—45 percent
- Say stony loam, 30 to 50 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—40 percent

Contrasting inclusions:
- Inclusion 1: Aridic Argixerolls stony loam, 8 to 15 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 2: Lithic Xerollic Haplargids very gravelly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 3: Rock outcrop—3 percent
- Inclusion 4: Lithic Xeric Torriorthents very cobbly loam, 50 to 75 percent slopes—Lithic Xeric Torriorthents, loamy, mixed, mesic—2 percent

Characteristics of the Gol Soil

Position on landscape: South- and west-facing side slopes of mountains
Parent material: Kind—residuum; source—granitic rocks
Slope features: Length—long; shape—convex

Dominant present vegetation: Wyoming big sagebrush, mountain big sagebrush, bluebunch wheatgrass, Idaho fescue, scattered Utah juniper

Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—18

Typical profile

0 to 7 inches—very cobbly sandy loam; 55 to 65 percent cobbles and stones and 15 to 30 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

7 to 18 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

18 inches—weathered bedrock

Soil and water features

Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.3 to 1.9 inches
Water-supplying capacity: About 10 inches
Runoff: Rapid

Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—1; wind erodibility group—5
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low

Potential for frost action: Moderate

Characteristics of the Say Soil

Position on landscape: North- and east-facing side slopes of mountains
Parent material: Kind—residuum; source—granitic rocks
Slope features: Length—long; shape—convex

Dominant present vegetation: Mountain big sagebrush, snowberry, bluebunch wheatgrass, Idaho fescue, scattered Utah juniper

Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—18

Typical profile

0 to 9 inches—stony loam; 5 to 15 percent cobbles and stones and 5 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

9 to 19 inches—cobbly loam; 5 to 30 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6
19 to 25 inches—gravelly coarse sandy loam; 0 to 15 percent cobbles and stones and 30 to 50 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHO classification—A-1

25 inches—weathered bedrock

**Soil and water features**

*Depth to bedrock:* 20 to 40 inches

*Depth to a seasonal high water table:* More than 60 inches

*Flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2.6 to 3.3 inches

*Water-supplying capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—24; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—moderate; to concrete—low

*Potential for frost action:* Moderate

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* The convex lower side slopes of mountains

*Distinctive present vegetation:* Bluebunch wheatgrass, basin big sagebrush

**Inclusion 2**

*Position on landscape:* Concave crests of mountains

*Distinctive present vegetation:* Black sagebrush, low sagebrush

**Inclusion 3**

*Position on landscape:* Scattered small peaks and ridges on mountains

*Distinctive present vegetation:* Barren

**Inclusion 4**

*Position on landscape:* Back slopes of mountains

*Distinctive present vegetation:* Utah juniper

**Other minor inclusions**

- On concave toe slopes adjacent to drainageways, areas that support quaking aspen

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Gol soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Suitability of the Say soil for named elements:** Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the Gol soil for selected uses and practices**

*Range seeding:* Poor—droughty, large stones

*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—depth to bedrock, small stones, slope

*Pond reservoir areas:* Severe—depth to bedrock, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings and restrictive features of the Say soil for selected uses and practices**

*Range seeding:* Poor—large stones, erodes easily

*Daily cover for landfill:* Poor—depth to bedrock, small stones, slope

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Topsoil:* Poor—small stones, slope

*Pond reservoir areas:* Severe—seepage, slope

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Gol—VIIa, nonirrigated; Say—VIIe, nonirrigated

*Range site:* Gol—024X028N; Say—024X021N

**1271—Gol-Say-Rock outcrop association, steep**

**Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,400 to 6,000 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free period:* About 90 days

**Composition**

*Major components:* 

- Gol very bouldery sandy loam, 30 to 50 percent slopes—Xerollic Haplargids, loamy-skeletal, mixed, frigid, shallow—30 percent

- Say very bouldery loam, 30 to 50 percent slopes—
Aridic Argixerolls, fine-loamy, mixed, frigid—30 percent
• Rock outcrop—25 percent

Contrasting inclusions:
• Inclusion 1: Aridic Haploxerolls very bouldery sandy loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—8 percent
• Inclusion 2: Lithic Xeric Torriorthents very cobbly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed, frigid—5 percent
• Inclusion 3: Fluvuaquentic Hapludolls loam, 0 to 4 percent slopes—Fluvuaquentic Hapludolls, loamy-skeletal, mixed, frigid—2 percent

Characteristics of the Gol Soil

Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—granitic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, mountain big sagebrush, bluebunch wheatgrass, scattered Utah Juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones, boulders; percentage of surface covered—50

Typical profile
0 to 7 inches—very bouldery sandy loam; 40 to 50 percent cobbles and stones and 30 to 40 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2
7 to 18 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2
18 inches—weathered bedrock

Soil and water features

Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.3 to 1.9 inches
Water-supplying capacity: About 10 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—3

Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Characteristics of the Say Soil

Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—granitic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, snowberry, bluebunch wheatgrass, Idaho fescue, scattered Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones, boulders; percentage of surface covered—35

Typical profile
0 to 9 inches—very bouldery loam; 10 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4
9 to 19 inches—cobbly loam; 5 to 30 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6
19 to 25 inches—gravely coarse sandy loam; 0 to 15 percent cobbles and stones and 30 to 50 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1
25 inches—weathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 2.6 to 3.3 inches
Water-supplying capacity: About 12 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—2; wind erodibility group—8
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

**Characteristics of the Rock Outcrop**

*Position on landscape:* Crests and side slopes of mountains
*Dominant present vegetation:* Barren

**Contrasting Inclusions**

**Inclusion 1**
*Position on landscape:* Concave side slopes of mountains
*Distinctive present vegetation:* Oceanspray, serviceberry

**Inclusion 2**
*Position on landscape:* Eroded side slopes of mountains
*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush

**Inclusion 3**
*Position on landscape:* Drainageways
*Distinctive present vegetation:* Basin wildrye, basin big sagebrush

**Major Uses**

*Current uses:* Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Gol soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
*Suitability of the Say soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the Gol soil for selected uses and practices**

*Range seeding:* Poor—droughty, large stones
*Daily cover for landfill:* Poor—depth to bedrock, slope, small stones
*Shallow excavations:* Severe—depth to bedrock, slope
*Local roads and streets:* Severe—slope
*Roadfill:* Poor—depth to bedrock, slope
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—depth to bedrock, small stones, slope
*Pond reservoir areas:* Severe—depth to bedrock, slope
*Embankments, dikes, and levees:* Severe—thin layer

**Roadfill:** Poor—depth to bedrock, slope
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—small stones, slope
*Pond reservoir areas:* Severe—seepage, slope
*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Gol—VIIs, nonirrigated; Say—VIIs, nonirrigated; Rock outcrop—VIIIIs
*Range site:* Gol—024X028N; Say—024X021N

**1272—Gol-Say-Rock outcrop association, very steep**

**Map Unit Setting**

*Position on landscape:* Mountains
*Elevation:* 5,500 to 6,500 feet
*Average annual precipitation:* About 9 inches
*Average annual air temperature:* About 44 degrees F
*Frost-free period:* About 100 days

**Composition**

*Major components:*
  - Gol very bouldery sandy loam, warm, 50 to 75 percent slopes—Xerollic Hapludands, loamy-skeletal, mixed, frigid, shallow—35 percent
  - Say very bouldery loam, 50 to 75 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—25 percent
  - Rock outcrop—25 percent

*Contrasting inclusions:*
  - Inclusion 1: Lithic Xeric Torriorthents very cobbly loam, 50 to 75 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed, frigid—8 percent
  - Inclusion 2: Xerollic Hapludands very bouldery loam, 30 to 50 percent slopes—Xerollic Hapludands, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 3: Cumulic Haplaquolls stony loam, 2 to 8 percent slopes—Cumulic Haplaquolls, loamy-skeletal, mixed, frigid—2 percent

**Characteristics of the Gol Soil**

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—granitic rocks
*Slope features:* Length—long; shape—convex
*Dominant present vegetation:* Desert needlegrass, Nevada ephedra, spiny hopsage, Indian ricegrass, scattered Utah juniper
*Rock fragments on the surface:* Kind—gravel, cobbles, stones, boulders; percentage of surface covered—50
Typical profile
0 to 7 inches—very bouldery sandy loam; 40 to 50 percent cobbles and stones and 30 to 40 percent pebbles (by weight); platy structure; soft, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2
7 to 18 inches—very gravelly clay loam; 0 to 10 percent cobbles and stones and 50 to 60 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2
18 inches—weathered bedrock

Soil and water features
Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.3 to 1.9 inches
Water-supplying capacity: About 10 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—1; wind erodibility group—5
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Characteristics of the Say Soil
Position on landscape: North- and east-facing mountainsides
Parent material: Kind—residuum; source—granitic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, snowberry, bluebunch wheatgrass, Idaho fescue, scattered Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones, boulders; percentage of surface covered—35

Typical profile
9 to 19 inches—cobbly loam; 5 to 30 percent cobbles and stones and 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2
19 to 25 inches—gravely coarse sandy loam; 0 to 15 percent cobbles and stones and 30 to 50 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1
25 inches—weathered bedrock

Soil and water features
Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 2.6 to 3.3 inches
Water-supplying capacity: About 12 inches
Runoff: Very rapid
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—2; wind erodibility group—8
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Characteristics of the Rock Outcrop
Position on landscape: Scattered small peaks and ridges
Dominant present vegetation: Barren

Contrasting Inclusions
Inclusion 1
Position on landscape: Concave side slopes of mountains
Distinctive present vegetation: Utah juniper, Wyoming big sagebrush

Inclusion 2
Position on landscape: Convex toe slopes of mountains
Distinctive present vegetation: Desert needlegrass, shadscale

Inclusion 3
Position on landscape: Concave toe slopes adjacent to channels
Distinctive present vegetation: Basin wildrye, basin big sagebrush
Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Gol soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Say soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Gol soil for selected uses and practices

Range seeding: Poor—droughty, large stones

Daily cover for landfill: Poor—depth to bedrock, slope, small stones

Shallow excavations: Severe—depth to bedrock, slope

Local roads and streets: Severe—slope

Roadfill: Poor—depth to bedrock, slope

Sand: Improbably source—excess fines

Gravel: Improbably source—excess fines

Topsoil: Poor—depth to bedrock, small stones, slope

Pond reservoir areas: Severe—depth to bedrock

Embinkments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Say soil for selected uses and practices

Range seeding: Poor—large stones, erodes easily

Daily cover for landfill: Poor—depth to bedrock, small stones, slope

Shallow excavations: Severe—cutbanks cave, slope

Local roads and streets: Severe—slope

Roadfill: Poor—depth to bedrock, slope

Sand: Improbably source—excess fines

Gravel: Improbably source—excess fines

Topsoil: Poor—small stones, slope

Pond reservoir areas: Severe—seepage, slope

Embinkments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Gol—VII, nonirrigated; Say—VII, nonirrigated; Rock outcrop—VIII

Range site: Gol—027X017N; Say—027X058N

1280—Gwena-Enko-Frewa association

Map Unit Setting

Position on landscape: Fan piedmont remnants

Elevation: 4,000 to 5,000 feet

Average annual precipitation: About 9 inches

Average annual air temperature: About 47 degrees F

Frost-free period: About 110 days

Composition

Major components:

- Gwena very fine sandy loam, 4 to 15 percent slopes—Xerolic Nadurargids, loamy, mixed, mesic, shallow—35 percent
- Enko fine sandy loam, 2 to 8 percent slopes—Durixerolic Cambithods, coarse-loamy, mixed, mesic—30 percent
- Frewa loamy fine sand, 2 to 8 percent slopes—Durothidic Xeric Torripsamment, mixed, mesic—20 percent

Contrasting inclusions:

- Inclusion 1: Snapp very fine sandy loam, 4 to 15 percent slopes—Durixerolic Natrargids, clayey over sandy or sandy-skeletal, montmorillonitic, mesic—8 percent
- Inclusion 2: McConnel fine sandy loam, 2 to 8 percent slopes—Xerolic Cambithods, sandy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Enko fine sandy loam, 15 to 30 percent slopes—Durixerolic Cambithods, coarse-loamy, mixed, mesic—2 percent

Characteristics of the Gwena Soil

Position on landscape: Fan piedmont remnants

Parent material: Mixed alluvium somewhat influenced by loess and volcanic ash

Slope features: Length—long; shape—convex

Dominant present vegetation: Thuber needlegrass, bottlebrush squirreltail, Sandberg bluegrass, Wyoming big sagebrush, spiny hopsage

Typical profile

0 to 9 inches—very fine sandy loam; 0 to 5 percent cobbles and stones and 0 to 20 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

9 to 19 inches—clay loam; 0 to 10 percent cobbles and stones and 0 to 25 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 8.9); nonsaline (2 to 4 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

19 inches—indurated layer; massive; extremely hard, extremely firm

Soil and water features

Depth to a hardpan: 14 to 20 inches

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.6 to 2.9 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.49; T value—1; wind erodibility group—3
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Enko Soil

Position on landscape: Fan skirts
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Thurbur needlegrass, bottlebrush squirreltail, Sandberg bluegrass, Wyoming big sagebrush, spiny hopsage

Typical profile

0 to 6 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
6 to 29 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); weak fine subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline or slightly saline (2 to 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4
29 to 60 inches—sandy loam; 0 to 25 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-2, A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: In the upper 18 inches—moderately slow; below that depth—rapid
Available water capacity: 4.0 to 5.1 inches
Water-supplying capacity: About 8 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—2
Hazard of erosion: By water—slight; by wind—severe
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low
Contrasting Inclusions

Inclusion 1
Position on landscape: Convex erosional fan piedmont remnants
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Inclusion 2
Position on landscape: Concave inset fans adjacent to channels
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Inclusion 3
Position on landscape: Concave side slopes of fan piedmont remnants
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Gwena soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Enko soil for named elements: Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Frewa soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Gwena soil for selected uses and practices

Range seeding: Poor—too crusty, droughty, excess sodium
Daily cover for landfill: Poor—cemented pan, seepage, small stones
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—cemented pan
Roadfill: Poor—cemented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—cemented pan, small stones
Pond reservoir areas: Severe—cemented pan, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Enko soil for selected uses and practices

Range seeding: Fair—too arid
Daily cover for landfill: Good
Shallow excavations: Slight
Local roads and streets: Moderate—frost action
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt
Pond reservoir areas: Moderate—seepage, slope
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Soil blowing, percs slowly, slope
Terraces and diversions: Erodes easily, soil blowing

Ratings and restrictive features of the Frewa soil for selected uses and practices

Range seeding: Poor—soil blowing, droughty
Daily cover for landfill: Fair—small stones, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, piping
Drainage: Deep to water
Irrigation: Droughty, fast intake, slope
Terraces and diversions: Too sandy, soil blowing

Interpretive Groups

Capability classification: Gwena—VII, nonirrigated; Enko—IVe, irrigated, and VII, nonirrigated; Frewa—Ile, irrigated, and VII, nonirrigated
Range site: Gwena—024X020N; Enko—024X020N; Frewa—024X020N

1290—Slaven-Linrose-Iver association

Map Unit Setting

Position on landscape: Mountains
Elevation: 6,200 to 8,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 70 days

Composition

Major components:
- Slaven very cobbly loam, 30 to 50 percent slopes—Arodic Argixerolls, clayey-skeletal, montmorillonitic, frigid—40 percent
- Linrose very gravelly loam, 50 to 75 percent slopes—Arodic Haploxerolls, loamy-skeletal, mixed, frigid—25 percent
Pershing County, Nevada, East Part

- Iver stony silt loam, 30 to 50 percent slopes—Pachic Haploxerolls, coarse-loamy, mixed, frigid—20 percent
  
  **Contrasting inclusions:**
  - Inclusion 1: Cleavage very gravely loam, 30 to 50 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
  - Inclusion 2: Roca very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—5 percent
  - Inclusion 3: Cleavage extremely gravely loam, 4 to 15 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—3 percent
  - Inclusion 4: Fluventic Haploxerolls loam, 2 to 8 percent slopes—Fluventic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent

  **Characteristics of the Slaven Soil**

  **Position on landscape:** South- and west-facing side slopes of mountains

  **Parent material:** Kind—residuum somewhat influenced by loess that contains volcanic ash; source—clay, shale, quartzite

  **Slope features:** Length—long; shape—convex

  **Dominant present vegetation:** Mountain big sagebrush, bluebunch wheatgrass, basin wildrye

  **Rock fragments on the surface:** Kind—gravel, cobbles, stones; percentage of surface covered—46

  **Typical profile**
  - 0 to 5 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-4
  - 5 to 36 inches—extremely gravelly clay; 0 to 15 percent cobbles and stones and 75 to 85 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2
  - 36 inches—unweathered bedrock

  **Soil and water features**

  **Depth to bedrock:** 20 to 40 inches

  **Depth to a seasonal high water table:** More than 60 inches

  **Flooding:** None

  **Permeability:** Slow

  **Available water capacity:** 2.8 to 3.9 inches

  **Water-supplying capacity:** About 12 inches

  **Runoff:** Very rapid

  **Hydrologic group:** C

  **Erosion factors (surface layer):** K value—.20; T value—2; wind erodibility group—7

  **Hazard of erosion:** By water—severe; by wind—slight

  **Shrink-swell potential:** Moderate

  **Corrosivity:** To steel—high; to concrete—low

  **Potential for frost action:** Moderate

  **Characteristics of the Linrose Soil**

  **Position on landscape:** North- and east-facing side slopes of mountains

  **Parent material:** Kind—residuum; source—shale, chert

  **Slope features:** Length—long; shape—convex

  **Dominant present vegetation:** Black sagebrush, Idaho fescue

  **Rock fragments on the surface:** Kind—gravel, cobbles, stones; percentage of surface covered—51

  **Typical profile**
  - 0 to 10 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2, A-4
  - 10 to 23 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, GM-GC; estimated AASHTO classification—A-2
  - 23 inches—unweathered bedrock

  **Soil and water features**

  **Depth to bedrock:** 20 to 40 inches

  **Depth to a seasonal high water table:** More than 60 inches

  **Flooding:** None

  **Permeability:** Moderate

  **Available water capacity:** 2.0 to 3.4 inches

  **Water-supplying capacity:** About 10 inches

  **Runoff:** Very rapid

  **Hydrologic group:** C

  **Erosion factors (surface layer):** K value—.17; T value—2; wind erodibility group—7

  **Hazard of erosion:** By water—severe; by wind—slight

  **Shrink-swell potential:** Low

  **Corrosivity:** To steel—high; to concrete—low

  **Potential for frost action:** Moderate

  **Characteristics of the Iver Soil**

  **Position on landscape:** North- and east-facing side slopes of mountains
Parent material: Kind—residuum; source—sandstone, shale, quartzite
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, Idaho fescue
Rock fragments on the surface: Kind—gravel, stones; percentage of surface covered—11

Typical profile
0 to 4 inches—stony silt loam; 5 to 10 percent cobbles and stones and 5 to 10 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML; estimated AASHTO classification—A-4
4 to 20 inches—silt loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
20 to 31 inches—gravely loam; 0 to 10 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4
31 to 60 inches—very cobbly loam; 45 to 55 percent cobbles and stones and 15 to 50 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, SM-SC, CL-ML; estimated AASHTO classification—A-2, A-4

Soil and water features
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 7.3 to 8.7 inches
Water-supplying capacity: About 13 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—7
Hazard of erosion: By water—severe, by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions
Inclusion 1
Position on landscape: Convex, north- and east-facing side slopes of mountains

Distinctive present vegetation: Low sagebrush
Inclusion 2
Position on landscape: Convex, south- and west-facing side slopes of mountains
Distinctive present vegetation: Bluebunch wheatgrass, Wyoming big sagebrush
Inclusion 3
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Low sagebrush
Inclusion 4
Position on landscape: Concave toe slopes adjacent to drainageways
Distinctive present vegetation: Basin wildrye, basin big sagebrush
Other minor inclusions
• Barren areas of rock outcrop on the crests and upper side slopes of mountains

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements
Suitability of the Slaven soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Linrose soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Iver soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Slaven soil for selected uses and practices
Range seeding: Poor—small stones, erodes easily
Daily cover for landfill: Poor—depth to bedrock, slope, small stones
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, too clayey
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Linrose soil for selected uses and practices
Range seeding: Poor—small stones, erodes easily
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Iver soil for selected uses and practices

Range seeding: Poor—erodes easily
Daily cover for landfill: Poor—large stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—area reclaim, small stones, slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—piping

Interpretive Groups
Capability classification: Slaven—VIII, nonirrigated;
Linrose—VIII, nonirrigated; Iver—VII, nonirrigated
Range site: Slaven—02X029N; Linrose—02X042N;
Iver—02X023N

1291—Slaven-Iver-Cleavage association

Map Unit Setting

Position on landscape: Mountains
Elevation: 6,200 to 8,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days

Composition

Major components:
• Slaven gravelly very fine sandy loam, 30 to 50 percent
slopes—Aridic Argixerolls, clayey, montmorillonitic,
frigid—35 percent
• Iver gravelly silt loam, 30 to 50 percent slopes—
Pachic Haploxerolls, coarse-loamy, mixed, frigid—30
percent
• Cleavage very gravelly loam, 30 to 50 percent
slopes—Lithic Argixerolls, loamy-skeletal, mixed,
frigid—20 percent
Contrasting inclusions:
• Inclusion 1: Roca very cobbly loam, 30 to 50 percent
slopes—Xerolic Hapludands, clayey-skeletal,
montmorillonitic, frigid—8 percent
• Inclusion 2: Rock outcrop—3 percent
• Inclusion 3: Fluventic Haploxerolls loam, 2 to 8
percent slopes—Fluventic Haploxerolls, fine-loamy,
mixed, frigid—2 percent
• Inclusion 4: Cleavage extremely gravelly loam, 4 to 15
percent slopes—Lithic Argixerolls, loamy-skeletal,
mixed, frigid—2 percent

Characteristics of the Slaven Soil

Position on landscape: South-facing side slopes of
mountains
Parent material: Kind—residuum influenced by loess
that contains ash; source—chert, shale, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush,
bluebunch wheatgrass, basin wildrye
Rock fragments on the surface: Kind—gravel;
percentage of surface covered—20

Typical profile

0 to 5 inches—gravelly very fine sandy loam; 35 to 50
percent pebbles (by weight); platy structure; soft,
very friable; neutral (pH 7.0); nonsaline (less than 2
mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—GM; estimated
AASHTO classification—A-4
5 to 36 inches—extremely gravelly clay; 0 to 15 percent
cobbles and stones and 75 to 85 percent pebbles
(by weight); subangular blocky structure; hard, firm;
neutral (pH 7.3); nonsaline (less than 2 mmhos/cm);
nonsodic (SAR less than 13); estimated Unified
classification—GC; estimated AASHTO
classification—A-2
36 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60
inches
Flooding: None
Permeability: Slow
Available water capacity: 2.8 to 3.9 inches
Water-supplying capacity: About 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.32; T value—
2; wind erodibility group—4
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Iver Soil

Position on landscape: North-facing side slopes of
mountains
Parent material: Kind—residuum; source—sandstone,
shale
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush,
Idaho fescue
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—25

Typical profile

0 to 4 inches—gravelly silt loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, ML; estimated AASHTO classification—A-4

4 to 20 inches—silt loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

20 to 31 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4

31 to 60 inches—very cobbly loam; 45 to 55 percent cobbles and stones and 15 to 50 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, SM-SC, CL-ML; estimated AASHTO classification—A-2, A-4

Soil and water features

Depth to bedrock: 14 to 20 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Moderately slow

Available water capacity: 1.9 to 2.2 inches

Water-supplying capacity: About 10 inches

Runoff: Rapid

Hydrologic group: B

Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—7

Hazard of erosion: By water—severe; by wind—slight

Shrink-swell potential: Low

Corrosivity: To steel—moderate; to concrete—low

Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1

Position on landscape: Convex, south- and west-facing side slopes of mountains

Distinctive present vegetation: Bluebunch wheatgrass, Wyoming big sagebrush

Inclusion 2

Position on landscape: Crests and side slopes of mountains

Distinctive present vegetation: Barren

Inclusion 3

Position on landscape: Drainageways

Distinctive present vegetation: Basin wildrye, basin big sagebrush

Inclusion 4

Position on landscape: Convex crests of mountains

Distinctive present vegetation: Idaho fescue, basin big sagebrush
Other minor inclusions
- On north-facing side slopes of mountains, areas that support threetip sagebrush

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Slaven soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Iver soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Cleavage soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Slaven soil for selected uses and practices

Range seeding: Poor—small stones, erodes easily
Daily cover for landfill: Poor—depth to bedrock, slope, small stones
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, too clayey
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Iver soil for selected uses and practices

Range seeding: Poor—small stones, erodes easily
Daily cover for landfill: Poor—slope, large stones
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—area reclaim, small stones, slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—piping

Ratings and restrictive features of the Cleavage soil for selected uses and practices

Range seeding: Poor—droughty, small stones, slope
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—slope, depth to bedrock
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines

Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—large stones

Interpretive Groups
Capability classification: Slaven—VIIe, nonirrigated; Iver—VIIe, nonirrigated; Cleavage—VIIa, nonirrigated
Range site: Slaven—024X029N; Iver—024X023N; Cleavage—024X027N

1292—Slaven-Iver-Rock outcrop association

Map Unit Setting

Position on landscape: Mountains
Elevation: 6,200 to 8,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days

Composition

Major components:
- Slaven very cobbly loam, 50 to 75 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—35 percent
- Iver stony silt loam, 50 to 75 percent slopes—Pachic Haploxerolls, coarse-loamy, mixed, frigid—35 percent
- Rock outcrop—15 percent
Contrasting inclusions:
- Inclusion 1: Cleavage very gravelly loam, 4 to 15 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—9 percent
- Inclusion 2: Pachic Cryoborolls cobbly loam, 15 to 30 percent slopes—Pachic Cryoborolls, loamy-skeletal, mixed—4 percent
- Inclusion 3: Cumulic Haploxerolls silt loam, 4 to 15 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, frigid—2 percent

Characteristics of the Slaven Soil

Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—chert, shale, quartzite
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, basin wildrye
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—46

Typical profile

0 to 5 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral
(pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-4

5 to 36 inches—extremely gravelly clay; 0 to 15 percent cobbles and stones and 75 to 85 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2

36 inches—unweathered bedrock

Soil and water features

**Depth to bedrock:** 20 to 40 inches

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Slow

**Available water capacity:** 2.8 to 3.9 inches

**Water-supplying capacity:** About 10 inches

**Runoff:** Very rapid

**Hydrologic group:** C

**Erosion factors (surface layer):** K value—20; T value—2; wind erodibility group—7

**Hazard of erosion:** By water—severe; by wind—slight

**Shrink-swell potential:** Moderate

**Corrosivity:** To steel—high; to concrete—low

**Potential for frost action:** Moderate

**Characteristics of the Iver Soil**

**Position on landscape:** North-facing side slopes of mountains

**Parent material:** Kind—residuum; source—sandstone, shale, quartzite

**Slope features:** Length—long; shape—concave

**Dominant present vegetation:** Mountain big sagebrush, Idaho fescue

**Rock fragments on the surface:** Kind—gravel, stones; percentage of surface covered—11

**Typical profile**

0 to 4 inches—stony silt loam; 5 to 10 percent cobbles and stones and 5 to 10 percent pebbles (by weight); granular structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

20 to 31 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4

31 to 60 inches—very cobbly loam; 45 to 55 percent cobbles and stones and 15 to 50 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, SM-SC, CL-ML; estimated AASHTO classification—A-2, A-4

Soil and water features

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Moderate

**Available water capacity:** 7.3 to 8.7 inches

**Water-supplying capacity:** About 13 inches

**Runoff:** Very rapid

**Hydrologic group:** B

**Erosion factors (surface layer):** K value—28; T value—5; wind erodibility group—7

**Hazard of erosion:** By water—severe; by wind—slight

**Shrink-swell potential:** Low

**Corrosivity:** To steel—moderate; to concrete—low

**Potential for frost action:** Moderate

**Characteristics of the Rock Outcrop**

**Position on landscape:** Crests and side slopes of mountains

**Dominant present vegetation:** Barren

**Contrasting Inclusions**

**Inclusion 1**

**Position on landscape:** Convex crests of mountains

**Distinctive present vegetation:** Low sagebrush

**Inclusion 2**

**Position on landscape:** Concave, north-facing side slopes of mountains

**Distinctive present vegetation:** Mountain big sagebrush, serviceberry

**Inclusion 3**

**Position on landscape:** The concave upper part of north-facing side slopes on mountains

**Distinctive present vegetation:** Quaking aspen

**Major Uses**

**Current uses:** Wildlife habitat
Wildlife habitat elements

Suitability of the Slaven soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Iver soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Slaven soil for selected uses and practices

Range seeding: Poor—small stones, erodes easily
Daily cover for landfill: Poor—depth to bedrock, slope, small stones
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, too clayey
Pond reservoir areas: Severe—slope
Embarkments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Iver soil for selected uses and practices

Range seeding: Poor—erodes easily
Daily cover for landfill: Poor—large stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—area reclaim, small stones, slope
Pond reservoir areas: Severe—seepage, slope
Embarkments, dikes, and levees: Severe—piping

Interpretive Groups

Capability classification: Slaven—VIIb, nonirrigated; Iver—VIIb, nonirrigated; Rock outcrop—VIIIs
Range site: Slaven—024X029N; Iver—024X023N

1320—Alyan-Chen-Rock outcrop association

Map Unit Setting

Position on landscape: Buttes
Elevation: 6,500 to 7,400 feet
Average annual precipitation: About 13 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 80 days

Composition

Major components:
• Alyan extremely stony loam, 15 to 30 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—40 percent
• Chen very stony loam, 4 to 15 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—25 percent
• Rock outcrop—20 percent
Contrasting inclusions:
• Inclusion 1: Aridic Argixerolls very stony loam, 30 to 50 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—9 percent
• Inclusion 2: Aridic Argixerolls very stony loam, 4 to 15 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
• Inclusion 3: Fluventic Haploxerolls loam, 0 to 4 percent slopes—Fluventic Haploxerolls, coarse-loamy, mixed, frigid—1 percent

Characteristics of the Alyan Soil

Position on landscape: Side slopes of buttes
Parent material: Kind—residuum; source—siliceous tuff, other volcanic rocks
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye, scattered Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—35

Typical profile

0 to 11 inches—extremely stony loam; 25 to 45 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
11 to 33 inches—gravelly clay; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7
33 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 3.2 to 4.8 inches
Water-supplying capacity: About 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—15; T value—2; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

Characteristics of the Chen Soil

Position on landscape: Summits of buttes
Parent material: Kind—residuum influenced by loess high in content of volcanic ash; source—rhyolite, andesite, volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, bluebunch wheatgrass, scattered Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—30

Typical profile
0 to 10 inches—very stony loam; 15 to 35 percent cobbles and stones and 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GM, CL-ML, ML; estimated AASHTO classification—A-4
10 to 19 inches—very gravelly clay; 15 to 45 percent cobbles and stones and 50 to 65 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 6.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2, A-7
19 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 12 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.5 to 2.9 inches
Water-supplying capacity: About 11 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Characteristics of the Rock Outcrop

Position on landscape: Rims of buttes
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1
Position on landscape: Concave side slopes of buttes
Distinctive present vegetation: Idaho fescue, mountain big sagebrush

Inclusion 2
Position on landscape: Convex summits and shoulder slopes of buttes
Distinctive present vegetation: Threetip sagebrush

Inclusion 3
Position on landscape: Toe slopes along drainage channels
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Aylan soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Chen soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Aylan soil for selected uses and practices

Range seeding: Poor—large stones
Daily cover for landfill: Poor—depth to bedrock, too clayey, hard to pack
Shallow excavations: Severe—depth to bedrock, slope Local roads and streets: Severe—low strength, slope, shrink-swell
Roadfill: Poor—depth to bedrock, low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Chen soil for selected uses and practices

Range seeding: Poor—large stones, droughty Daily cover for landfill: Poor—depth to bedrock, too clayey, small stones
Shallow excavations: Severe—depth to bedrock Local roads and streets: Severe—depth to bedrock Roadfill: Poor—depth to bedrock Sand: Improbable source—excess fines Gravel: Improbable source—excess fines Topsoil: Poor—depth to bedrock, small stones Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer, large stones

Interpretive Groups
Capability classification: Alyan—VII, nonirrigated; Chen—VII, nonirrigated; Rock outcrop—VII, nonirrigated
Range site: Alyan—024X021N; Chen—024X027N

1321—Alyan-Slaven association

Map Unit Setting
Position on landscape: Mountains
Elevation: 6,500 to 7,400 feet
Average annual precipitation: About 13 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 80 days

Composition
Major components:
• Alyan extremely stony loam, 15 to 30 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—45 percent
• Slaven very cobbly loam, 15 to 30 percent slopes—Aridic Argixerolls, clayey-skeletal, montmorillonitic, frigid—40 percent
Contrasting inclusions:
• Inclusion 1: Lithic Argixerolls very cobbly loam, 4 to 15 percent slopes—Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid—5 percent
• Inclusion 2: Aridic Argixerolls cobbly loam, 30 to 50 percent slopes—Aridic Argixerolls, fine, montmorillonitic, frigid—4 percent
• Inclusion 3: Cumulic Haploxerolls loam, 0 to 4 percent slopes—Cumulic Haploxerolls, loamy-skeletal, mixed, frigid—3 percent
• Inclusion 4: Rock outcrop—3 percent

Characteristics of the Alyan Soil
Position on landscape: North-facing back slopes of mountains
Parent material: Kind—residuum influenced by loess; source—clay, shale, volcanic rocks
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, basin wildrye
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—35

Typical profile
0 to 11 inches—extremely stony loam; 25 to 45 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated
Unified classification—SM, ML; estimated AASHTO classification—A-4
11 to 33 inches—gravelly clay; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7
33 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 3.2 to 4.8 inches
Water-supplying capacity: About 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.15; T value—2; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

Characteristics of the Slaven Soil
Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum influenced by loess; source—clay, shale, volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, basin wildrye
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—46

Typical profile
0 to 5 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-4
5 to 36 inches—extremely gravelly clay; 0 to 15 percent cobbles and stones and 75 to 85 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2
36 inches—unweathered bedrock
Soil and water features

Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Slow
Available water capacity: 2.8 to 3.9 inches
Water-supplying capacity: About 12 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.20; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Bluebunch wheatgrass, mountain big sagebrush

Inclusion 2
Position on landscape: Convex, north-facing side slopes of mountains
Distinctive present vegetation: Idaho fescue, mountain big sagebrush

Inclusion 3
Position on landscape: Areas near drainageways
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Inclusion 4
Position on landscape: Scattered small peaks and ridges
Distinctive present vegetation: Barren

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Aylan soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Slaven soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Aylan soil for selected uses and practices

Range seeding: Poor—large stones
Daily cover for landfill: Poor—depth to bedrock, too clayey, hard to pack
Shallow excavations: Severe—depth to bedrock, slope

Local roads and streets: Severe—low strength, slope, shrink-swell
Roadfill: Poor—depth to bedrock, low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Slaven soil for selected uses and practices

Range seeding: Poor—small stones
Daily cover for landfill: Poor—depth to bedrock, slope, small stones
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, too clayey
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Aylan—VIIIs, nonirrigated; Slaven—VIIIs, nonirrigated
Range site: Aylan—024X021N; Slaven—024X029N

1340—Laped-Colbar association

Map Unit Setting

Position on landscape: Side slopes of foothills
Elevation: 5,000 to 6,000 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 100 days

Composition

Major components:
• Laped very cobbly loam, 30 to 50 percent slopes—Typic Durargids, loamy, mixed, mesic, shallow—55 percent
• Colbar very cobbly loam, 30 to 50 percent slopes—Xerolic Haplalgids, fine-loamy, mixed, mesic—30 percent

Contrasting inclusions:
• Inclusion 1: Typic Haplalgids very cobbly loam, 30 to 50 percent slopes—Typic Haplalgids, fine, montmorillonitic, mesic—9 percent
• Inclusion 2: Lithic Haplalgids very cobbly loam, 4 to 15 percent slopes—Lithic Haplalgids, clayey-skeletal, montmorillonitic, mesic—4 percent
• Inclusion 3: Rock outcrop—2 percent
**Characteristics of the Laped Soil**

*Position on landscape:* South-facing side slopes of foothills  
*Parent material:* Kind—colluvium, residuum; source—rhyolitic tuff, andesite, basalt  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Shadscale, bud sagebrush, bottlebrush squirreltail  
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—37

**Typical profile**

0 to 5 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, GM-GC; estimated AASHTO classification—A-4

5 to 18 inches—gravelly clay loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-6, A-7

18 to 22 inches—inverted layer; massive; extremely hard, extremely firm

22 inches—unweathered bedrock

**Soil and water features**

*Depth to a hardpan:* 14 to 20 inches  
*Depth to bedrock:* 20 to 30 inches  
*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.1 to 3.6 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—10; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential for frost action:* Low

**Characteristics of the Colbar Soil**

*Position on landscape:* North-facing side slopes of foothills  
*Parent material:* Kind—colluvium, residuum; source—andesite, rhyolite  
*Slope features:* Length—long; shape—convex  

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass  
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—55

**Typical profile**

0 to 1 inch—very cobbly loam; 50 to 60 percent cobbles and stones and 5 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

1 to 24 inches—cobbly loam; 10 to 35 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; hard, firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-6

24 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.1 to 3.6 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—10; T value—2; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—high; to concrete—low  
*Potential for frost action:* Moderate

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* Concave, south-facing side slopes of foothills  
*Distinctive present vegetation:* Shadscale, bud sagebrush

**Inclusion 2**

*Position on landscape:* Crests and shoulder slopes of foothills  
*Distinctive present vegetation:* Wyoming big sagebrush, shadscale

**Inclusion 3**

*Position on landscape:* The crests and upper side slopes of foothills  
*Distinctive present vegetation:* Barren
Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Laped soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the Colbar soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Laped soil for selected uses and practices

Range seeding: Poor—too arid, erodes easily, large stones
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, cemented pan, slope
Local roads and streets: Severe—cemented pan, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan, small stones, slope
Pond reservoir areas: Severe—cemented pan, slope
Embarkments, dikes, and levees: Severe—thick layer

Ratings and restrictive features of the Colbar soil for selected uses and practices

Range seeding: Poor—large stones
Daily cover for landfill: Poor—depth to bedrock, large stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—large stones, slope
Pond reservoir areas: Severe—seepage, slope
Embarkments, dikes, and levees: Severe—large stones

Interpretive Groups

Capability classification: Laped—VII, nonirrigated; Colbar—VII, nonirrigated
Range site: Laped—024X002N; Colbar—024X005N

1350—Burnborough-Cleavage-Reluctan association

Map Unit Setting

Position on landscape: Mountains
Elevation: 7,000 to 8,500 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 42 degrees F

Frost-free period: About 80 days

Composition

Major components:
- Burnborough very gravelly loam, 15 to 30 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—40 percent
- Cleavage very gravelly loam, 4 to 15 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—30 percent
- Reluctan gravelly loam, 15 to 30 percent slopes—Aridic Argixerolls, fine-loamy, mixed, frigid—15 percent

Contrasting inclusions:
- Inclusion 1: Hopeka very cobbly loam, 15 to 30 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, frigid—5 percent
- Inclusion 2: Pachic Argixerolls gravelly silt loam, 2 to 8 percent slopes—Pachic Argixerolls, fine-loamy, mixed, frigid—5 percent
- Inclusion 3: Rock outcrop—4 percent
- Inclusion 4: Cumulic Haplaquolls silt loam, 0 to 2 percent slopes—Cumulic Haplaquolls, fine-silty, mixed, frigid—1 percent

Characteristics of the Burnborough Soil

Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—andesite, rhyolite
Slope features: Length—long; shape—convex
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, basin wildrye, scattered Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—55

Typical profile

0 to 13 inches—very gravelly loam; 5 to 10 percent cobbles and stones and 45 to 60 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, SM-SC; estimated AASHTO classification—A-2

13 to 60 inches—very gravelly loam; 15 to 25 percent cobbles and stones and 40 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 5.1 to 6.9 inches
Water-supplying capacity: About 10 inches
Runoff: Rapid
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—5; wind erosion group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Characteristics of the Cleavage Soil
Position on landscape: Shoulder slopes and crests of mountains
Parent material: Kind—residuum; source—rhyolite, andesite
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, bluebunch wheatgrass, Idaho fescue
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—55

Typical profile
0 to 10 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2, A-4, A-6
10 to 17 inches—very gravelly loam; 0 to 45 percent cobbles and stones and 55 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2
17 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.9 to 2.2 inches
Water-supplying capacity: About 10 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.10; T value—1; wind erosion group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Characteristics of the Reluctan Soil
Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—rhyolite, andesite
Slope features: Length—short; shape—convex
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue, scattered Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

Typical profile
0 to 9 inches—gravelly loam; 5 to 10 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4
9 to 25 inches—gravelly clay loam; 0 to 15 percent cobbles and stones and 25 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7
25 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 2.7 to 3.4 inches
Water-supplying capacity: About 11 inches
Runoff: Rapid
Hydrologic group: C
Erosion factors (surface layer): K value—.24; T value—2; wind erosion group—6
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions
Inclusion 1
Position on landscape: The convex upper part of side slopes on mountains
Distinctive present vegetation: Singleleaf pinyon, Utah juniper
Inclusion 2
*Position on landscape:* Concave inset fans on valley fans in the mountains
*Distinctive present vegetation:* Idaho fescue, mountain big sagebrush

**Inclusion 3**
*Position on landscape:* The upper part of side slopes on mountains
*Distinctive present vegetation:* Barren

**Inclusion 4**
*Position on landscape:* Concave valley fans on mountains
*Distinctive present vegetation:* Sedge

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Wildlife habitat elements**

*Suitability of the Burnborough soil for named elements:*
  - Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Cleavage soil for named elements:*
  - Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Suitability of the Reluctan soil for named elements:*
  - Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

**Ratings and restrictive features of the Burnborough soil for selected uses and practices**

*Range seeding:* Poor—small stones
*Daily cover for landfill:* Poor—small stones, slope
*Shallow excavations:* Severe—slope
*Local roads and streets:* Severe—slope
*Roadfill:* Fair—slope, shrink-swell
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—small stones, slope
*Pond reservoir areas:* Severe—slope
*Embankments, dikes, and levees:* Moderate—large stones

**Ratings and restrictive features of the Cleavage soil for selected uses and practices**

*Range seeding:* Poor—droughty, small stones
*Daily cover for landfill:* Poor—depth to bedrock, small stones
*Shallow excavations:* Severe—depth to bedrock
*Local roads and streets:* Severe—depth to bedrock
*Roadfill:* Poor—depth to bedrock
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—depth to bedrock, small stones
*Pond reservoir areas:* Severe—depth to bedrock, slope
*Embankments, dikes, and levees:* Severe—large stones

**Ratings and restrictive features of the Reluctan soil for selected uses and practices**

*Range seeding:* Fair—too arid, small stones
*Daily cover for landfill:* Poor—small stones, slope, depth to bedrock
*Shallow excavations:* Severe—depth to bedrock, slope
*Local roads and streets:* Severe—slope
*Roadfill:* Poor—depth to bedrock
*Sand:* Improbable source—excess fines
*Gravel:* Improbable source—excess fines
*Topsoil:* Poor—small stones, slope
*Pond reservoir areas:* Severe—slope
*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Burnborough—VIIs, nonirrigated; Cleavage—VIIs, nonirrigated; Reluctan—VII, nonirrigated
*Range site:* Burnborough—024X021N; Cleavage—024X027N; Reluctan—024X021N

**1360—Kram-Hopeka-Rock outcrop association**

**Map Unit Setting**

*Position on landscape:* Mountains
*Elevation:* 5,500 to 7,000 feet
*Average annual precipitation:* About 10 inches
*Average annual air temperature:* About 45 degrees F
*Frost-free period:* About 90 days

**Composition**

**Major components:**
- Kram very gravelly very fine sandy loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic—35 percent
- Hopeka very gravelly loam, 50 to 75 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, frigid—35 percent
- Rock outcrop—15 percent

**Contrasting inclusions:**
- Inclusion 1: Iver gravelly silt loam, 30 to 50 percent slopes—Pachic Haploxerolls, coarse-loamy, mixed, frigid—9 percent
- Inclusion 2: Sumine very gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—4 percent
- Inclusion 3: Puffer very gravelly loam, 4 to 15 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—2 percent

**Characteristics of the Kram Soil**

*Position on landscape:* Foot slopes and side slopes of mountains
Parent material: Kind—residuum; source—limestone, dolomite
Slope features: Length—long; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—61

Typical profile

0 to 2 inches—very gravelly very fine sandy loam; 10 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

2 to 8 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 45 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline or slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

8 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 6 to 14 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 0.8 to 1.0 inch
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.20; T value—1; wind erosibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Hopekka Soil

Position on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—limestone, dolomite
Slope features: Length—long; shape—plane to convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—61

Typical profile

0 to 10 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2

10 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 4 to 10 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 0.4 to 0.7 inch
Water-supplying capacity: About 8 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.20; T value—1; wind erosibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Rock Outcrop

Position on landscape: Crests and side slopes of mountains
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1
Position on landscape: Concave, south-facing side slopes of mountains
Distinctive present vegetation: Mountain big sagebrush

Inclusion 2
Position on landscape: Convex, north-facing side slopes of mountains
Distinctive present vegetation: Mountain big sagebrush

Inclusion 3
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Black sagebrush

Major Uses

Current uses: Wildlife habitat, woodland

Ratings of the Kram soil for use as woodland

Site index for common trees: Singleleaf pinyon—25; Utah juniper—25
Most important native understory plants: Bluebunch wheatgrass, black sagebrush

Ratings of the Hopeka soil for use as woodland

Site index for common trees: Singleleaf pinyon—20; Utah juniper—20
Most important native understory plants: Bluebunch wheatgrass, black sagebrush

Wildlife habitat elements

Suitability of the Kram soil for named elements: Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the Hopeka soil for named elements: Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Kram soil for selected uses and practices

Range seeding: Poor—too arid, droughty, small stones
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Hopeka soil for selected uses and practices

Range seeding: Poor—too arid, droughty, small stones
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Kram—VII, nonirrigated; Hopeka—VII, nonirrigated; Rock outcrop—VII
Range site: Kram—02X501N; Hopeka—02X501N
Woodland suitability group: Kram—3R; Hopeka—3R

1390—Mulhop-Xine-Rock outcrop association

Map Unit Setting

Position on landscape: Mountains
Elevation: 6,000 to 7,500 feet
Average annual precipitation: About 12 inches

Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days

Composition

Major components:
- Mulloh cobble loam, 30 to 50 percent slopes—Lithic Xerolic Calcixerolls, loamy-skeletal, mixed, frigid—40 percent
- Xine gravelly silt loam, 30 to 50 percent slopes—Aridic Calcixerolls, loamy-skeletal, mixed, frigid—30 percent
- Rock outcrop—20 percent

Contrasting inclusions:
- Inclusion 1: Iver gravelly silt loam, 30 to 50 percent slopes—Pachic Haploxerolls, coarse-loamy, mixed, frigid—5 percent
- Inclusion 2: Cleavage extremely gravelly loam, 4 to 15 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—4 percent
- Inclusion 3: Fluventic Haploxerolls loam, 0 to 4 percent slopes—Fluventic Haploxerolls, coarse-loamy, mixed, frigid—1 percent

Characteristics of the Mulhop Soil

Position on landscape: South-facing side slopes of mountains
Parent material: Kind—residuum; source—limestone
Slope features: Length—long; shape—convex
Dominant present vegetation: Utah juniper, black sagebrush
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—25

Typical profile

0 to 6 inches—cobbly loam; 15 to 30 percent cobbles and stones and 10 to 30 percent pebbles (by weight); platy structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4
6 to 17 inches—very gravelly loam; 15 to 30 percent cobbles and stones and 40 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2, A-4, A-6
17 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 1.5 to 2.0 inches
Water-supplying capacity: About 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.24; T value—1; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Xine Soil
Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—limestone, shale
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—31

Typical profile
0 to 10 inches—gravely silt loam; 0 to 5 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
10 to 38 inches—very cobbly loam; 35 to 50 percent cobbles and stones and 35 to 60 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4, A-1
38 inches—weathered bedrock

Soil and water features
Depth to bedrock: 20 to 40 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 3.0 to 4.1 inches
Water-supplying capacity: About 11 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (surface layer): K value—.24; T value—2; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low

Potential for frost action: Moderate

Characteristics of the Rock Outcrop
Position on landscape: Scattered small peaks and ridges
Dominant present vegetation: Barren
Contrasting Inclusions

Inclusion 1
Position on landscape: Concave, north-facing side slopes of mountains
Distinctive present vegetation: Idaho fescue, mountain big sagebrush

Inclusion 2
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Low sagebrush

Inclusion 3
Position on landscape: Concave toe slopes adjacent to channels
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Major Uses
Current uses: Rangeland, wildlife habitat
Foresseeable uses: Rangeland, wildlife habitat, woodland

Ratings of the Mulhop soil for use as woodland
Site index for common trees: Utah juniper—20
Most important native understory plants: Black sagebrush, bottlebrush squirreltail, Sandberg bluegrass, basin wildrye

Wildlife habitat elements
Suitability of the Mulhop soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—good; coniferous plants (nonirrigated)—fair

Suitability of the Xine soil for named elements: Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Mulhop soil for selected uses and practices
Range seeding: Poor—large stones, droughty, erodes easily
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer, large stones

Ratings and restrictive features of the Xine soil for selected uses and practices

Range seeding: Poor—eroses easily
Daily cover for landfill: Poor—large stones, slope, depth to bedrock
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—large stones

Interpretive Groups

Capability classification: Mulhop—VIIe, nonirrigated; Xine—VIIe, nonirrigated; Rock outcrop—VIIIa
Range site: Mulhop—027X075N; Xine—024X021N
Woodland suitability group: Mulhop—3R

1410—Yobe-Bezo-Yobe, occasionally flooded, association

Map Unit Setting

Position on landscape: Lake plains
Elevation: 4,000 to 4,200 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 120 days

Composition

Major components:
- Yobe silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—30 percent
- Bezo silt clay, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—40 percent
- Yobe silt loam, occasionally flooded, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Typic Torriorthents silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Typic Torriflevents silt loam, 0 to 2 percent slopes—Typic Torriflevents, fine-silty, mixed (calcareous), mesic—3 percent
- Inclusion 3: Goldrun Variant sandy loam, 4 to 15 percent slopes—Typic Torriorthents, coarse-loamy, gyspic, mesic—2 percent

Characteristics of the Rarely Flooded Yobe Soil

Position on landscape: The slightly higher areas on lake plain terraces
Parent material: Lacustrine sediments
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Torrey quailbush, black greasewood, buffalo berry, inland saltgrass

Typical profile

0 to 14 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6
14 to 60 inches—stratified very fine sandy loam to silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 24 to 40); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6

Soil and water features

Depth to a seasonal high water table: November through May—36 to 60 inches; rest of year—more than 60 inches
Flooding: Rare
Permeability: Moderately slow
Available water capacity: 11.0 to 12.0 inches
Water-supplying capacity: About 10 inches
Runoff: Ponded
Hydrologic group: C
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Characteristics of the Bezo Soil

Position on landscape: Lake plain terraces
Parent material: Lacustrine sediments
Slope features: Length—long; shape—smooth
Dominant present vegetation: Torrey quailbush, black greasewood, seepweed

Typical profile

0 to 3 inches—silty clay; platy structure; hard, friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CH, CL, MH; estimated AASHTO classification—A-7
3 to 42 inches—silty clay loam; massive; slightly hard,
friable; moderately alkaline (pH 8.4); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
42 to 60 inches or more—silty clay; massive; slightly hard, friable; moderately alkaline (pH 8.2); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CH, CL, MH; estimated AASHTO classification—A-7

Soil and water features

Depth to a seasonal high water table: February through June—12 to 24 inches; rest of year—more than 60 inches
Flooding: Frequency—occasional; duration—brief; months—January through May
Permeability: Slow
Available water capacity: 10.0 to 11.0 inches
Water-supplying capacity: About 20 to 25 inches
Runoff: Ponded
Hydrologic group: D
Erosion factors (surface layer): K value—.37; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Characteristics of the Occasionally Flooded Yobe Soil

Position on landscape: The channelized lower areas of lake plain terraces
Parent material: Lacustrine sediments
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Black greasewood, basin wildrye

Typical profile

0 to 14 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, CL-ML; estimated Unified classification—A-4, A-6
14 to 60 inches—stratified very fine sandy loam to silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-6

Soil and water features

Depth to a seasonal high water table: November through May—36 to 60 inches; rest of year—more than 60 inches
Flooding: Frequency—occasional; duration—brief; months—February through June
Permeability: Moderately slow
Available water capacity: 11.0 to 12.0 inches
Water-supplying capacity: About 20 to 25 inches
Runoff: Very slow
Hydrologic group: C
Erosion factors (surface layer): K value—.43; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Contrasting Inclusions

Inclusion 1
Position on landscape: Channels on the higher lake plain terraces
Distinctive present vegetation: Basin big sagebrush

Inclusion 2
Position on landscape: Channels on the lower lake plain terraces
Distinctive present vegetation: Basin wildrye, Torrey quailbush

Inclusion 3
Position on landscape: Convex parna dunes on edges of lake plains
Distinctive present vegetation: Torrey quailbush, shadscale

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the rarely flooded Yobe soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Bezo soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the occasionally flooded Yobe soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the rarely flooded Yobe soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too arid
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Moderate—wetness
Local roads and streets: Severe—low strength, frost action
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt, excess sodium

Ratings and restrictive features of the Bezo soil for selected uses and practices
Range seeding: Poor—excess salt, excess sodium, too arid
Daily cover for landfill: Poor—wetness, excess salt, excess sodium
Shallow excavations: Severe—wetness
Local roads and streets: Severe—low strength, flooding, frost action
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—too clayey, excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—wetness, excess salt, excess sodium

Ratings and restrictive features of the occasionally flooded Yobe soil for selected uses and practices
Range seeding: Poor—excess salt, excess sodium, too arid
Daily cover for landfill: Poor—excess sodium, excess salt
Shallow excavations: Moderate—wetness, flooding
Local roads and streets: Severe—low strength, flooding, frost action
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt, excess sodium

Interpretive Groups
Capability classification: Yobe, rarely flooded—VIIw, nonirrigated; Bezo—VIIw, nonirrigated; Yobe, occasionally flooded—VIIw, nonirrigated
Range site: Yobe, rarely flooded—024X015N; Bezo—027X044N; Yobe, occasionally flooded—024X011N

Frost-free period: About 120 days

Composition
Major components:
• Yobe silt loam, 0 to 2 percent slopes—Aeric Halapepts, fine-silty, mixed (calcareous), mesic—55 percent
• Sonoma silt loam, frequently flooded, strongly saline, 0 to 2 percent slopes—Aeric Fluvaquents, fine-silty, mixed (calcareous), mesic—30 percent
Contrasting inclusions:
• Inclusion 1: Yipor silt loam, 0 to 2 percent slopes—Typic Torriorthents, coarse-silty, mixed (calcareous), mesic—9 percent
• Inclusion 2: Typic Torriorthents silt loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed, mesic—4 percent
• Inclusion 3: Aeric Halapepts silt loam, 0 to 2 percent slopes—Aeric Halapepts, coarse-silty, mixed (calcareous), mesic—2 percent

Characteristics of the Yobe Soil
Position on landscape: Alluvial flats adjacent to flood plains
Parent material: Lacustrine sediments
Slope features: Length—long; shape—smooth
Dominant present vegetation: Torrey quailbush, black greasewood, basin wildrye, rabbitbrush

Typical profile
0 to 14 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6
14 to 60 inches or more—stratified very fine sandy loam to silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6

Soil and water features
Depth to a seasonal high water table: November through May—36 to 60 inches; rest of year—more than 60 inches
Flooding: Rare
Permeability: Moderately slow
Available water capacity: 11.0 to 12.0 inches
Water-supplying capacity: About 10 inches
Runoff: Ponded
Hydrologic group: C

1411—Yobe-Sonoma association

Map Unit Setting
Position on landscape: Basin floors
Elevation: 4,000 to 4,800 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 50 degrees F
Erosion factors (surface layer): K value—.43; T value—
5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Characteristics of the Sonoma Soil

Position on landscape: Flood plains
Parent material: Mixed silty alluvium influenced by
volcanic ash
Slope features: Length—long; shape—smooth
Dominant present vegetation: Alkali sacaton, inland
saltgrass, black greasewood

Typical profile
0 to 9 inches—silt loam; platy structure; slightly hard,
very friable; strongly alkaline (pH 8.6); strongly
saline (more than 16 mmhos/cm); strongly sodic
(SAR more than 46); estimated Unified
classification—CL; estimated AASHTO
classification—A-6
9 to 60 inches—stratified silt loam to silty clay loam;
massive; hard, firm; strongly alkaline (pH 8.8);
nonsaline or slightly saline (2 to 8 mmhos/cm);
nonsodic (SAR less than 13); estimated Unified
classification—CL, ML; estimated AASHTO
classification—A-6, A-7

Soil and water features

Depth to a seasonal high water table: February through
January—18 to 36 inches
Flooding: Frequency—frequent; duration—brief;
months—February through January
Permeability: Moderately slow
Available water capacity: 11.0 to 12.0 inches
Water-supplying capacity: About 14 inches
Runoff: Ponded
Hydrologic group: C
Erosion factors (surface layer): K value—.43; T value—
5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Distinctive present vegetation: Shadscale, black
greasewood

Inclusion 3
Position on landscape: The higher flood plains in areas
of slightly channelized streams
Distinctive present vegetation: Black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Yobe soil for named elements: Wild
herbaceous plants (nonirrigated)—very poor; shrubs
(nonirrigated)—very poor
Suitability of the Sonoma soil for named elements: Wild
herbaceous plants (nonirrigated)—very poor; shrubs
(nonirrigated)—very poor

Ratings and restrictive features of the Yobe soil for
selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too
crusty
Daily cover for landfill: Poor—excess sodium
Shallow excavations: Moderate—wetness
Local roads and streets: Severe—low strength, frost
action
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt,
excess sodium

Ratings and restrictive features of the Sonoma soil
for selected uses and practices

Range seeding: Poor—excess salt, excess sodium
Daily cover for landfill: Fair—too clayey, wetness
Shallow excavations: Severe—wetness
Local roads and streets: Severe—low strength, flooding,
frost action
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, too clayey
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—wetness,
excess salt

Interpretive Groups

Capability classification: Yobe—VIIw, nonirrigated;
Sonoma—VIIw, nonirrigated
Range site: Yobe—024X015N; Sonoma—024X009N
1412—Yobe silt loam, occasionally flooded

Map Unit Setting

Position on landscape: Lake plains
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 49 degrees F
Frost-free period: About 110 days

Composition

Major component:
- Yobe silt loam, occasionally flooded, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—90 percent

Contrasting inclusions:
- Inclusion 1: Benin silt loam, 0 to 2 percent slopes—Typic Torriorthents, fine, montmorillonitic (calcareous), mesic—4 percent
- Inclusion 2: Dun Glen silt loam, 0 to 2 percent slopes—Typic Camborthods, coarse-loamy, mixed, mesic—3 percent
- Inclusion 3: Raglan silt loam, 0 to 2 percent slopes—Duric Camborthods, fine-loamy, mixed, mesic—2 percent
- Inclusion 4: Wendane silt loam, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—1 percent

Characteristics of the Yobe Soil

Position on landscape: Lake plains
Parent material: Mixed lake sediments
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Black greasewood, basin wildrye, seepweed

Typical profile

0 to 14 inches—silt loam; platy structure; slightly hard, friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6
14 to 60 inches—stratified very fine sandy loam to silty clay loam; massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-6

Soil and water features

Depth to a seasonal high water table: November through May—36 to 60 inches; rest of year—more than 60 inches
Flooding: Frequency—occasional; duration—brief; months—February through June
Permeability: Moderately slow

Available water capacity: 11.0 to 12.0 inches
Water-supplying capacity: About 15 inches
Runoff: Ponded
Hydrologic group: C
Erosion factors (surface layer): K value—.43; T value—.5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Contrasting Inclusions

Inclusion 1
Position on landscape: Slightly convex alluvial flats adjacent to lake plains
Distinctive present vegetation: Shadscale, black greasewood

Inclusion 2
Position on landscape: Smooth fan skirts
Distinctive present vegetation: Shadscale, bud sagebrush

Inclusion 3
Position on landscape: Slightly convex alluvial flats adjacent to lake plains
Distinctive present vegetation: Shadscale, bud sagebrush

Inclusion 4
Position on landscape: Slightly concave alluvial flats
Distinctive present vegetation: Black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Yobe soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

 Ratings and restrictive features of the Yobe soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium, too crusty
Daily cover for landfill: Poor—excess sodium, excess salt
Shallow excavations: Moderate—flooding, wetness
Local roads and streets: Severe—flooding, low strength, frost action
Roadfill: Poor—low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess salt, excess sodium
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt, excess sodium
Interpretive Groups

Capability classification: Vllw, nonirrigated
Range site: 024X011N

1420—Goldrun Variant sandy loam, 4 to 15 percent slopes

Map Unit Setting

Position on landscape: Parna dunes
Elevation: 4,050 to 4,150 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 54 degrees F
Frost-free period: About 110 days

Composition

Major component:
- Goldrun Variant sandy loam, 4 to 15 percent slopes—Typic Torriorthents, coarse-loamy, gyspic (calcareous), mesic—90 percent
- Inclusion 1: Bezo silty clay, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Yobe Variant silty clay, 0 to 2 percent slopes—Aeric Halaquepts, fine, montmorillonitic (calcareous), mesic—5 percent

Characteristics of the Goldrun Variant Soil

Position on landscape: Parna dunes
Parent material: Eolian material
Slope features: Length—short; shape—convex
Dominant present vegetation: Black greasewood, shadscale, seepweed

Typical profile

0 to 4 inches—sandy loam; platy structure; soft, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); moderately sodic (SAR 24 to 45); estimated Unified classification—SM; estimated AASHTO classification—A-4
4 to 60 inches—gysiferous material

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 1.8 to 3.0 inches
Water-supplying capacity: About 4 to 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—severe
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Smooth alluvial flats on the outer basin side of parna dunes
Distinctive present vegetation: Torrey quailbush

Inclusion 2
Position on landscape: Smooth lake plains on the inner basin side of parna dunes
Distinctive present vegetation: Iodinebush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Goldrun Variant soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Goldrun Variant soil for selected uses and practices

Range seeding: Poor—excess salt, too arid
Daily cover for landfill: Poor—excess lime
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Severe—unstable fill
Roadfill: Poor—excess gypsum
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—excess lime
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—excess gypsum

Interpretive Groups

Capability classification: Vlls, nonirrigated
Range site: 027X036N

1430—Yobe Variant silty clay

Map Unit Setting

Position on landscape: Lake plains
Elevation: 4,000 to 5,000 feet
Average annual precipitation: About 6 inches
Average annual air temperature: About 52 degrees F
Frost-free period: About 120 days

Composition

Major component:
- Yobe Variant silty clay, 0 to 2 percent slopes—Aeric Halaquepts, fine, montmorillonitic (calcareous), mesic—90 percent
Contrasting inclusions:
- Inclusion 1: Bezo silty clay, 0 to 2 percent slopes—Aeric Halaquepts, fine-silty, mixed (calcareous), mesic—5 percent
- Inclusion 2: Goldrun Variant sandy loam, 2 to 8 percent slopes—Typic Torriorthents, coarse-loamy, gypsy, mesic—5 percent

Characteristics of the Yobe Variant Soil

Position on landscape: Lake plains
Parent material: Lacustrine sediments
Slope features: Length—long; shape—smooth
Dominant present vegetation: Iodinebush, alkali sacaton

Typical profile

0 to 8 inches—silty clay; platy structure; hard, friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 46 to 100); estimated Unified classification—MH, CH; estimated AASHTO classification—A-7
8 to 60 inches—silty clay; platy structure; hard, friable; strongly alkaline (pH 8.6); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—MH, CH; estimated AASHTO classification—A-7

Soil and water features

Depth to a seasonal high water table: January through July—6 to 18 inches; rest of year—more than 60 inches
Flooding: Frequency—frequent; duration—brief; months—January through June
Permeability: Very slow
Available water capacity: 9.0 to 10.0 inches
Water-supplying capacity: About 15 inches
Runoff: Ponded
Hydrologic group: D
Erosion factors (surface layer): K value—.32; T value—5; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Contrasting Inclusions

Inclusion 1
Position on landscape: The smooth upper part of lake plains
Distinctive present vegetation: Torrey quailbush

Inclusion 2
Position on landscape: Convex parma dunes
Distinctive present vegetation: Black greasewood

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Yobe Variant soil for named elements:
Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Yobe Variant soil for selected uses and practices

Range seeding: Poor—excess salt, excess sodium
Daily cover for landfill: Poor—too clayey, hard to pack, wetness
Shallow excavations: Severe—wetness
Local roads and streets: Severe—low strength, wetness, flooding
Roadfill: Poor—low strength, wetness, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—too clayey, excess salt, wetness
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—hard to pack, wetness, excess salt

Interpretive Groups

Capability classification: Vllw, nonirrigated
Range site: 024X010N

1450—Alley-Snowmore-Rock outcrop association

Map Unit Setting

Position on landscape: Hills
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Alley very cobbly very fine sandy loam, 30 to 50 percent slopes—Durixerollic Haplorgids, fine-loamy, mixed, mesic—40 percent
- Snowmore very cobbly loam, 2 to 8 percent slopes—Xerollic Durargids, fine-loamy, mixed, mesic—30 percent
- Rock outcrop—15 percent

Contrasting inclusions:
- Inclusion 1: Rubble land—5 percent
- Inclusion 2: Roca very cobbly loam, 30 to 50 percent slopes—Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—5 percent
- Inclusion 3: Aridic Argixerolls gravelly loam, 30 to 50
percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—4 percent
- Inclusion 4: Fluventic Haploxerolls loam, 0 to 4 percent slopes—Fluventic Haploxerolls, fine-loamy, mixed, mesic—1 percent

**Characteristics of the Alley Soil**

*Position on landscape:* Side slopes of hills  
*Parent material:* Kind—residuum, colluvium; source—basalt  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Sandberg bluegrass  
*Rock fragments on the surface:* Kind—gravely, cobbles, stones; percentage of surface covered—55

**Typical profile**

- 0 to 5 inches—very cobbly very fine sandy loam; 30 to 40 percent cobbles and stones and 30 to 50 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM, SM-SC, SM; estimated AASHTO classification—A-2
- 5 to 22 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, GC; estimated AASHTO classification—A-6
- 22 to 30 inches—cobbly fine sandy loam; 0 to 40 percent cobbles and stones and 20 to 30 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4
- 30 to 60 inches—very cobbly fine sandy loam; 30 to 45 percent cobbles and stones and 30 to 40 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SM; estimated AASHTO classification—A-2

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 5.9 to 7.1 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Rapid  

*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high; to concrete—low  
*Potential for frost action:* Moderate

**Characteristics of the Snowmore Soil**

*Position on landscape:* Summits of hills  
*Parent material:* Kind—residuum; source—basalt  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Sandberg bluegrass  
*Rock fragments on the surface:* Kind—gravely, cobbles, stones; percentage of surface covered—35

**Typical profile**

- 0 to 8 inches—very cobbly loam; 40 to 50 percent cobbles and stones and 20 to 35 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC, CL-ML, CL; estimated AASHTO classification—A-4, A-6
- 8 to 16 inches—clay loam; 0 to 10 percent cobbles and stones and 0 to 15 percent pebbles (by weight); subangular blocky structure; hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 16 to 24 inches—gravely clay loam; 0 to 10 percent cobbles and stones and 25 to 35 percent pebbles (by weight); massive; hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7
- 24 to 28 inches—indurated layer; extremely hard, extremely firm
- 28 inches—unweathered bedrock

**Soil and water features**

*Depth to a hardpan:* 20 to 40 inches  
*Depth to bedrock:* 24 to 40 inches  
*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.5 to 4.0 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Medium  
*Hydrologic group:* C
Erosion factors (surface layer): K value—10; T value—2; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Rock Outcrop
Position on landscape: The summits and upper side slopes of hills
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex side slopes of hills
Distinctive present vegetation: Barren

Inclusion 2
Position on landscape: The convex upper side slopes of hills
Distinctive present vegetation: Bluebunch wheatgrass, Wyoming big sagebrush

Inclusion 3
Position on landscape: Concave, north-facing side slopes of hills
Distinctive present vegetation: Mountain big sagebrush, Idaho fescue

Inclusion 4
Position on landscape: Drainageways
Distinctive present vegetation: Basin big sagebrush

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Alley soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Snowmore soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Alley soil for selected uses and practices

Range seeding: Poor—large stones
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—area reclaim, small stones, slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—piping

Ratings and restrictive features of the Snowmore soil for selected uses and practices

Range seeding: Poor—large stones
Daily cover for landfill: Poor—depth to bedrock, cemented pan
Shallow excavations: Severe—depth to bedrock, cemented pan
Local roads and streets: Severe—low strength
Roadfill: Poor—depth to bedrock, cemented pan, low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones
Pond reservoir areas: Moderate—depth to bedrock, cemented pan, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups
Capability classification: Alley—VII, nonirrigated;
Snowmore—VII, nonirrigated; Rock outcrop—VIII
Range site: Alley—024X005N; Snowmore—024X005N

1480—Tusel-Layview-Rock outcrop association

Map Unit Setting
Position on landscape: Mountains
Elevation: 7,300 to 9,700 feet
Average annual precipitation: About 15 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 65 days

Composition
Major components:
• Tusel cobbly loam, 30 to 50 percent slopes—Argic Pachic Cryoborolls, loamy-skeletal, mixed—45 percent
• Layview very gravelly loam, 50 to 75 percent slopes—Argic Lithic Cryoborolls, loamy-skeletal, mixed—20 percent
• Rock outcrop—20 percent
Contrasting inclusions:
• Inclusion 1: Layview extremely gravelly loam, 4 to 15 percent slopes—Argic Lithic Cryoborolls, loamy-skeletal, mixed—5 percent
• Inclusion 2: Aridic Argixerolls cobbly loam, 50 to 75 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
• Inclusion 3: Aridic Haploxerolls cobbly loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—3 percent
• Inclusion 4: Fluventic Haploxerolls loam, 0 to 4 percent slopes—Fluventic Haploxerolls, fine-loamy, mixed, frigid—2 percent
**Characteristics of the Tusel Soil**

*Position on landscape:* Side slopes of mountains  
*Parent material:* Kind—residuum; source—shale, chert, quartzie  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, mountain brome, Idaho fescue, slender wheatgrass  
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—16

**Typical profile**

0 to 12 inches—cobbly loam; 15 to 35 percent cobbles and stones and 10 to 25 percent pebbles (by weight); granular structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML, SM-SC, CL-ML; estimated AASHTO classification—A-4  
12 to 42 inches—very gravelly clay loam; 15 to 45 percent cobbles and stones and 60 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2  
42 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 40 to 60 inches  
*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 3.8 to 4.9 inches  
*Water-supplying capacity:* About 14 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—3; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential for frost action:* Moderate

**Characteristics of the Layview Soil**

*Position on landscape:* Side slopes of mountains  
*Parent material:* Kind—residuum; source—volcanic rocks  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Low sagebrush, Idaho fescue  
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—80

**Typical profile**

0 to 7 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
7 to 14 inches—very gravelly loam; 10 to 15 percent cobbles and stones and 45 to 70 percent pebbles (by weight); massive; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6  
14 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 10 to 14 inches  
*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 1.0 to 1.4 inches  
*Water-supplying capacity:* About 9 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—moderate; to concrete—low  
*Potential for frost action:* Moderate

**Characteristics of the Rock Outcrop**

*Position on landscape:* The crests and upper side slopes of mountains  
*Dominant present vegetation:* Barren

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* Convex crests of mountains  
*Distinctive present vegetation:* Idaho fescue, low sagebrush

**Inclusion 2**

*Position on landscape:* The concave lower part of side slopes on mountains  
*Distinctive present vegetation:* Idaho fescue, mountain big sagebrush

**Inclusion 3**

*Position on landscape:* Mountaintops, the upper part of side slopes on mountains, areas adjacent to Rock outcrop  
*Distinctive present vegetation:* Serviceberry, oceanspray
Inclusion 4
Position on landscape: Toe slopes adjacent to drainageways
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Tusel soil for named elements: Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

Suitability of the Layview soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Tusel soil for selected uses and practices
Range seeding: Poor—small stones, erodes easily
Daily cover for landfill: Poor—slope, small stones
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Fair—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Layview soil for selected uses and practices
Range seeding: Poor—droughty, small stones
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups
Capability classification: Tusel—VIIe, nonirrigated; Layview—VIIe, nonirrigated; Rock outcrop—VIIls
Range site: Tusel—024X032; Layview—024X027N

1490—Xine-Mulhop-Puffer association
Map Unit Setting
Position on landscape: Mountains

Elevation: 5,800 to 7,500 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 46 degrees F
Frost-free period: About 85 days

Composition

Major components:
• Xine very gravelly loam, 30 to 50 percent slopes—Aridic Calcixerolls, loamy-skeletal, mixed, frigid—40 percent
• Mulhop very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Calcorthids, loamy-skeletal, mixed, frigid—30 percent
• Puffer very cobbly loam, 30 to 50 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—15 percent

Contrasting inclusions:
• Inclusion 1: Rock outcrop—7 percent
• Inclusion 2: Mulhop extremely stony loam, 4 to 15 percent slopes—Lithic Xerollic Calcorthids, loamy-skeletal, mixed, frigid—5 percent
• Inclusion 3: Aridic Argixerolls gravelly loam, 30 to 50 percent slopes—Aridic Argixerolls, loamy-skeletal, mixed, frigid—2 percent
• Inclusion 4: Fluventic Haploxerolls loam, 0 to 2 percent slopes—Fluventic Haploxerolls, loamy-skeletal, mixed, frigid—1 percent

Characteristics of the Xine Soil
Position on landscape: North-facing side slopes of mountains
Parent material: Kind—residuum; source—limestone, shale
Slope features: Length—long; shape—concave
Dominant present vegetation: Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—50

Typical profile
0 to 10 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
10 to 38 inches—very cobbly loam; 35 to 50 percent cobbles and stones and 35 to 60 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4
Soil and water features

**Depth to bedrock:** 20 to 40 inches

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Moderately rapid

**Available water capacity:** 3.0 to 4.1 inches

**Water-supplying capacity:** About 11 inches

**Runoff:** Medium

**Hydrologic group:** C

**Erosion factors (surface layer):** K value—10; T value—2; wind erodibility group—7

**Hazard of erosion:** By water—moderate; by wind—slight

**Shrink-swell potential:** Low

**Corrosivity:** To steel—high; to concrete—low

**Potential for frost action:** Moderate

Characteristics of the Puffer Soil

**Position on landscape:** South-facing foot slopes of mountains

**Parent material:** Kind—residuum; source—limestone, shale

**Slope features:** Length—long; shape—convex

**Dominant present vegetation:** Black sagebrush, Sandberg bluegrass

**Rock fragments on the surface:** Kind—gravel, cobbles, stones; percentage of surface covered—60

Typical profile

0 to 2 inches—very cobbly loam; 25 to 40 percent cobbles and stones and 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2, A-4

2 to 11 inches—very gravelly loam; 15 to 40 percent cobbles and stones and 50 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GC, GM-GC; estimated AASHTO classification—A-2

11 to 12 inches—weathered bedrock

12 inches—unweathered bedrock

Soil and water features

**Depth to bedrock:** 14 to 20 inches

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Moderately rapid

**Available water capacity:** 1.5 to 2.0 inches

**Water-supplying capacity:** About 8 inches

**Runoff:** Rapid

**Hydrologic group:** D

**Erosion factors (surface layer):** K value—20; T value—1; wind erodibility group—7

**Hazard of erosion:** By water—severe; by wind—slight

**Shrink-swell potential:** Moderate

**Corrosivity:** To steel—high; to concrete—low

**Potential for frost action:** Moderate
Contrasting Inclusions

Inclusion 1
Position on landscape: Scattered small peaks and ridges
Distinctive present vegetation: Barren

Inclusion 2
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Utah juniper, black sagebrush

Inclusion 3
Position on landscape: North-facing shoulder slopes of mountains
Distinctive present vegetation: Threetip sagebrush

Inclusion 4
Position on landscape: Concave toe slopes adjacent to channels
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Ratings of the Mulhop soil for use as woodland

Site index for common trees: Utah juniper—20
Most important native understory plants: Black sagebrush, bottlebrush squirreltail, Sandberg bluegrass, basin wildrye

Wildlife habitat elements

Suitability of the Xine soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Mulhop soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—poor; coniferous plants (nonirrigated)—fair
Suitability of the Puffer soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Xine soil for selected uses and practices

Range seeding: Poor—small stones
Daily cover for landfill: Poor—large stones, slope, depth to bedrock
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the Mulhop soil for selected uses and practices

Range seeding: Poor—small stones, droughty, erodes easily
Daily cover for landfill: Poor—depth to bedrock, small stones, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Puffer soil for selected uses and practices

Range seeding: Poor—droughty, large stones, erodes easily
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—large stones

Interpretive Groups

Capability classification: Xine—VIIs, nonirrigated;
Mulhop—VIIs, nonirrigated; Puffer—VIIs, nonirrigated
Range site: Xine—024X021N; Mulhop—027X075N;
Puffer—024X030N
Woodland suitability group: Mulhop—3R

1500—Cortez very fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

Position on landscape: Valley fans on mountains
Elevation: 5,000 to 5,500 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days

Composition

Major component:
- Cortez very fine sandy loam, 2 to 8 percent slopes—
Xerolic Nadurargids, fine, montmorillonitic, mesic—85 percent

Contrasting inclusions:
- Inclusion 1: Durixerolic Natrargids loam, 2 to 8 percent slopes—Durixerolic Natrargids, fine-loamy, mixed, mesic—8 percent
- Inclusion 2: Durixerolic Natrargids loam, 2 to 8 percent slopes—Durixerolic Natrargids, clayey-skeletal, montmorillonitic, mesic—5 percent
- Inclusion 3: Fluventic Haploxerolls loam, 0 to 4 percent slopes—Fluventic Haploxerolls, fine-loamy, mixed, mesic—2 percent

Characteristics of the Cortez Soil

Position on landscape: Valley fans on mountains
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, rabbitbrush, basin wildrye
Rock fragments on the surface: Kind—gravel; percentage of surface covered—5

Typical profile
0 to 8 inches—very fine sandy loam; 5 to 15 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
8 to 33 inches—clay; 15 to 25 percent pebbles (by weight); prismatic structure; hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—CH; estimated AASHTO classification—A-7
33 to 46 inches—indurated layer; massive; extremely hard, extremely firm
46 to 60 inches—very cobbly coarse sandy loam; 15 to 50 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.5); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 22 to 36 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—very slow; below the duripan—rapid
Available water capacity: 4.7 to 5.7 inches
Water-supplying capacity: About 8 inches

Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.55; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Concave areas on valley fans in the mountains
Distinctive present vegetation: Thurberry needlegrass, Wyoming big sagebrush

Inclusion 2
Position on landscape: Convex foot slopes of mountains
Distinctive present vegetation: Thurberry needlegrass, Wyoming big sagebrush

Inclusion 3
Position on landscape: Concave inset fans adjacent to channels
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Cortez soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Cortez soil for selected uses and practices

Range seeding: Poor—excess sodium, too crusty
Daily cover for landfill: Poor—cemented pan, hard to pack
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Severe—low strength, shrink-swell
Roadfill: Poor—cemented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Moderate—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—hard to pack, excess salt
Drainage: Deep to water
Irrigation: Percs slowly, cemented pan, soil blowing
Terraces and diversions: Large stones, cemented pan
Interpretive Groups

Capability classification: IVe, irrigated, and VIa, nonirrigated
Range site: 024X005N

1501—Cortez-Tenabo-Beoska association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,500 to 5,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Cortez very stony loam, 2 to 8 percent slopes—Xerollic Nadurargids, fine, montmorillonitic, mesic—35 percent
- Tenabo very cobbly loam, 2 to 8 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—30 percent
- Beoska very stony loam, 2 to 8 percent slopes—Duric Natragids, fine-loamy, mixed, mesic—20 percent
Contrasting inclusions:
- Inclusion 1: Weso very fine sandy loam, 0 to 4 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—8 percent
- Inclusion 2: Trocken Variant cobbly loam, rarely flooded, 2 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—6 percent
- Inclusion 3: Cumulic Haplaquolls silt loam, 0 to 2 percent slopes—Cumulic Haplaquolls, fine-loamy, mixed, mesic—1 percent

Characteristics of the Cortez Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium that has a thin mantle of loess
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravels, cobbles; percentage of surface covered—20

Typical profile

0 to 8 inches—very stony loam; 10 to 25 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

8 to 33 inches—clay; 15 to 25 percent pebbles (by weight); prismatic structure; hard, very firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CH; estimated AASHTO classification—A-7

33 to 46 inches—indurated layer; massive; extremely hard, extremely firm

46 to 60 inches—very cobbly coarse sandy loam; 15 to 50 percent cobbles and stones and 40 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.5); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 22 to 36 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—very slow; below the duripan—rapid
Available water capacity: 4.7 to 5.7 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.28; T value—2; wind erodibility group—6
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Moderate

Characteristics of the Tenabo Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium mantled by loess
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush
Rock fragments on the surface: Kind—gravels, cobbles; percentage of surface covered—35

Typical profile

0 to 5 inches—very cobbly loam; 30 to 50 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-4

5 to 17 inches—clay loam; 5 to 15 percent pebbles (by weight); prismatic structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23);
estimated Unified classification—CL; estimated AASHTO classification—A-6
17 to 24 inches—indurated layer; massive; extremely hard, extremely firm
24 to 60 inches—stratified very gravelly sandy loam to extremely gravelly loamy sand; 10 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline or moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GP-GM, GM, GW-GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 12 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—moderately slow; below the duripan—rapid
Available water capacity: 3.2 to 3.5 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—10; T value—1; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Characteristics of the Beoska Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—32

Typical profile

0 to 13 inches—very stony loam; 15 to 30 percent cobbles and stones and 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
13 to 25 inches—clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
25 to 44 inches—stratified very gravelly very fine sandy loam to gravelly sandy loam; 0 to 10 percent cobbles and stones and 30 to 45 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
44 to 60 inches—stratified very gravelly sandy loam to extremely gravelly very fine sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.0 to 8.3 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—24; T value—5; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex fan skirts adjacent to fan remnants
Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

Inclusion 2
Position on landscape: Drainageways
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Inclusion 3
Position on landscape: The concave lower part of fan skirts
Distinctive present vegetation: Alkali sacaton

Major Uses

Current uses: Rangeland, wildlife habitat
Wildlife habitat elements

Suitability of the Cortez soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Tenabo soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Beoska soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Cortez soil for selected uses and practices

Range seeding: Poor—excess sodium, large stones
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan, cutbanks cave
Local roads and streets: Moderate—cemented pan, frost action
Roadfill: Poor—cemented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—area reclaim
Pond reservoir areas: Severe—seepage
Embarkments, dikes, and levees: Severe—excess sodium, excess salt

Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, excess sodium
Pond reservoir areas: Severe—seepage
Embarkments, dikes, and levees: Severe—excess salt, excess sodium

Interpretive Groups

Capability classification: Cortez—VIIa, nonirrigated; Tenabo—VIIa, nonirrigated; Beoska—VIIa, nonirrigated
Range site: Cortez—024X005N; Tenabo—024X002N; Beoska—024X002N

1510—Locane-Rock outcrop association

Map Unit Setting

Position on landscape: Mountains
Elevation: 6,000 to 7,200 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 46 degrees F
Frost-free period: About 75 days

Composition

Major components:
• Locane cobbly loam, 50 to 75 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, frigid—60 percent
• Rock outcrop—25 percent
Contrasting inclusions:
• Inclusion 1: Bojo very cobbly loam, 30 to 50 percent slopes—Lithic Haplargids, loamy, mixed, mesic—8 percent
• Inclusion 2: Lithic Argixerolls, very cobbly loam, 50 to 75 percent slopes—Lithic Argixerolls, loamy, mixed, frigid—6 percent
• Inclusion 3: Fluventic Haploxerolls loam, 0 to 4 percent slopes—Fluventic Haploxerolls, fine-loamy, mixed, frigid—1 percent

Characteristics of the Locane Soil

Position on landscape: Mountains
Parent material: Kind—residuum; source—granite
Slope features: Length—long; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—55

Typical profile

0 to 2 inches—cobbly loam; 25 to 40 percent cobbles and stones and 5 to 20 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/
cm); nonsodic (SAR less than 13); estimated
Unified classification—CL-ML, SM-SC; estimated
AASHTO classification—A-4
2 to 16 inches—very gravelly clay loam; 0 to 10 percent
cobbles and stones and 50 to 65 percent pebbles
(by weight); subangular blocky structure; hard, firm;
mildly alkaline (pH 7.4); nonsaline (less than 2
mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—GC; estimated
AASHTO classification—A-2
16 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 10 to 20 inches
Depth to a seasonal high water table: More than 60
inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 1.8 to 2.1 inches
Water-supplying capacity: About 9 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.24; T value—
1; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

Characteristics of the Rock Outcrop

Position on landscape: Ridgetops, mountains
Slope features: Scattered small peaks and ridges
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1
Position on landscape: South-facing foot slopes
Distinctive present vegetation: Shadscale

Inclusion 2
Position on landscape: North-facing back slopes
Distinctive present vegetation: Utah juniper, singleleaf
pinyon

Inclusion 3
Position on landscape: Areas along channels
Distinctive present vegetation: Basin big sagebrush

Major Uses

Current uses: Wildlife habitat

Ratings of the Locane soil for use as woodland

Site index for common trees: Singleleaf pinyon—22;
Utah juniper—22
Most important native understory plants: Basin wildrye,
Nevada ephedra, bluegrass, bluebunch wheatgrass,
mountain big sagebrush

Wildlife habitat elements

Suitability of the Locane soil for named elements: Wild
herbaceous plants (nonirrigated)—fair; coniferous
plants (nonirrigated)—fair; shrubs (nonirrigated)—
fair

Ratings and restrictive features of the Locane soil for
selected uses and practices

Range seeding: Poor—erodes easily, small stones
Daily cover for landfill: Poor—small stones, slope, depth
to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, depth to bedrock
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Locane—VIIe, nonirrigated;
Rock outcrop—VIIIa
Range site: Locane—024X049N
Woodland suitability group: Locane—3R

1530—Polum-Dekoom-Polum Variant
association

Map Unit Setting

Position on landscape: Mountains
Elevation: 7,500 to 9,000 feet
Average annual precipitation: About 15 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days

Composition

Major components:
• Polum gravelly silt loam, 30 to 50 percent slopes—
Calcic Pachic Coryborolls, loamy-skeletal, mixed—40
percent
• Dekoom very gravelly loam, 50 to 75 percent slopes—
Cryic Rendolls, loamy-skeletal, carbonatic—30 percent
• Polum Variant extremely gravelly loam, 4 to 15
percent slopes—Calcic Coryborolls, loamy-skeletal,
mixed—15 percent
Contrasting inclusions:
• Inclusion 1: Rock outcrop—9 percent
• Inclusion 2: Calcic Pachic Coryborolls very gravelly
loam, 30 to 50 percent slopes—Calcic Pachic
Coryborolls, loamy-skeletal, mixed—6 percent
**Characteristics of the Polum Soil**

*Position on landscape:* Mountains

*Parent material:* Kind—residuum; source—shale, limestone

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, snowberry, mountain brome, spike fescue

**Typical profile**

0 to 7 inches—gravelly silt loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-4

7 to 17 inches—very gravelly loam; 55 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

17 to 60 inches—very gravelly loam; 55 to 75 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches

*Flooding:* None

*Permeability:* Moderate

*Available water capacity:* 5.1 to 6.7 inches

*Water-supplying capacity:* About 14 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Dekoom Variant Soil**

*Position on landscape:* Mountains

*Parent material:* Kind—residuum; source—shale, limestone

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, spike fescue, Cusick bluegrass, lupine, Idaho fescue

*Rock fragments on the surface:* Kind—gravel, cobbles; percentage of surface covered—32

**Typical profile**

0 to 3 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

3 to 13 inches—gravelly silt loam; 40 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-4

13 to 37 inches—very gravelly loam; 50 to 75 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

37 to 60 inches—extremely gravelly loam; 75 to 85 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches

*Flooding:* None

*Permeability:* Moderate

*Available water capacity:* 4.8 to 6.3 inches

*Water-supplying capacity:* About 13 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* To steel—high; to concrete—low

*Potential for frost action:* Moderate
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—88

Typical profile
0 to 2 inches—extremely gravelly loam; 0 to 5 percent cobbles and stones and 80 to 90 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1
2 to 10 inches—very gravelly silt loam; 50 to 75 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2, A-4
10 to 23 inches—very gravelly silt loam; 0 to 5 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2, A-4
23 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 20 to 30 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 1.5 to 2.6 inches
Water-supplying capacity: About 10 inches
Runoff: Medium
Hydrologic group: C
Erosion factors (surface layer): K value—.05; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Scattered small peaks and ridges
Distinctive present vegetation: Barren

Inclusion 2
Position on landscape: Concave, north-facing side slopes of mountains
Distinctive present vegetation: Serviceberry, oceanspray

Major Uses
Current uses: Wildlife habitat, rangeland

Wildlife habitat elements
Suitability of the Polum soil for named elements: Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good
Suitability of the Dekoom soil for named elements: Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good
Suitability of the Polum Variant soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Polum soil for selected uses and practices
Range seeding: Poor—eroses easily
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, area reclaim
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the Dekoom soil for selected uses and practices
Range seeding: Poor—small stones, erodes easily
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, slope, area reclaim
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the Polum Variant soil for selected uses and practices
Range seeding: Poor—small stones, droughty
Daily cover for landfill: Poor—depth to bedrock, small stones
Shallow excavations: Poor—depth to bedrock
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups
Capability classification: Polum—VIIe, nonirrigated;
1540—Dewar-Tenabo-Beoska association

Map Unit Setting

Position on landscape: Fan piedmonts
Elevation: 4,200 to 5,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 48 degrees F
Frost-free period: About 110 days

Composition

Major components:
- Dewar gravelly silt loam, 4 to 15 percent slopes—Xerolic Nadurargids, loamy, mixed, mesic, shallow—35 percent
- Tenabo very fine sandy loam, 2 to 8 percent slopes—Typic Nadurargids, loamy, mixed, mesic, shallow—25 percent
- Beoska very fine sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine-loamy, mixed, mesic—25 percent

Contrasting inclusions:
- Inclusion 1: Cortez very fine sandy loam, 15 to 30 percent slopes—Xerolic Nadurargids, fine, montmorillonitic, mesic—8 percent
- Inclusion 2: Weso very fine sandy loam, 2 to 8 percent slopes—Duric Camborthids, coarse-loamy, mixed, mesic—4 percent
- Inclusion 3: Xeric Torriorthents cobbly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic—3 percent

Characteristics of the Dewar Soil

Position on landscape: Fan piedmont remnants
Parent material: Loess over mixed alluvium
Slope features: Length—long; shape—convex
Dominant present vegetation: Wyoming big sagebrush, Sandberg bluegrass, basin wildrye
Rock fragments on the surface: Kind—gravel; percentage of surface covered—20

Typical profile

0 to 5 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; moderately friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
5 to 17 inches—clay loam; 5 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL; estimated AASHTO classification—A-6
17 to 24 inches—indurated duripan; massive; extremely hard, extremely firm
24 to 60 inches—extremely gravelly loamy sand; 5 to 25 percent cobbles and stones and 45 to 65 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); slightly saline or moderately saline (4 to 16 mmhos/cm); nonsodic
Soil and water features

Depth to a hardpan: 15 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the duripan—moderately slow; below the duripan—rapid
Available water capacity: 3.2 to 3.5 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.55; T value—1; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Low

Characteristics of the Beoska Soil

Position on landscape: Fan piedmont remnants
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, bud sagebrush, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel; percentage of surface covered—2

Typical profile

0 to 13 inches—very fine sandy loam; 5 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4
13 to 25 inches—clay loam; 0 to 25 percent pebbles (by weight); prismatic structure; slightly hard, friable; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
25 to 44 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
44 to 60 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones and 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline or strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 6.0 to 8.3 inches
Water-supplying capacity: About 7 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.49; T value—5; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Side slopes of fan piedmont remnants
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Inclusion 2
Position on landscape: Smooth fan skirts adjacent to fan piedmonts
Distinctive present vegetation: Shadscale, bud sagebrush

Inclusion 3
Position on landscape: Concave inset fans adjacent to channels
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Dewar soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Tenabo soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Beoska soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Dewar soil for selected uses and practices

Range seeding: Poor—droughty
Daily cover for landfill: Poor—cemented pan
Shallow excavations: Severe—cemented pan
Local roads and streets: Severe—cemented pan
Roadfill: Poor—cemented pan
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan, small stones
Pond reservoir areas: Severe—cemented pan, slope
Embankments, dikes, and levees: Severe—piping
Drainage: Deep to water
Irrigation: Cemented pan, slope, erodes easily
Terraces and diversions: Slope, cemented pan, erodes easily

Ratings and restrictive features of the Tenabo soil for selected uses and practices

Range seeding: Poor—excess sodium, too crusty, too arid
Daily cover for landfill: Poor—cemented pan, seepage, too sandy
Shallow excavations: Severe—cemented pan, cutbanks, cave
Local roads and streets: Severe—cemented pan
Roadfill: Poor—cemented pan
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—cemented pan, small stones, too sandy
Pond reservoir areas: Severe—cemented pan, seepage
Embankments, dikes, and levees: Severe—seepage, excess sodium, excess salt
Drainage: Deep to water
Irrigation: Cemented pan, erodes easily, slope
Terraces and diversions: Cemented pan

Ratings and restrictive features of the Beoska soil for selected uses and practices

Range seeding: Poor—too arid, too crusty, excess sodium
Daily cover for landfill: Poor—small stones
Shallow excavations: Slight
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—area reclaim, small stones, excess salt

Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—excess salt
Drainage: Deep to water
Irrigation: Slope, excess sodium, erodes easily
Terraces and diversions: Erodes easily, soil blowing

Interpretive Groups
Capability classification: Dewar—IVe, irrigated, and VIIIs, nonirrigated; Tenabo—IVe, irrigated, and VIIIs, nonirrigated; Beoska—Ile, irrigated, and VIIIs, nonirrigated
Range site: Dewar—024X005N; Tenabo—024X002N; Beoska—024X002N

1550—Eastwell-Shabliss-Blackhawk association

Map Unit Setting
Position on landscape: Fan piedmont remnants
Elevation: 4,200 to 5,200 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

Composition
Major components:
• Eastwell very gravelly loam, 2 to 8 percent slopes—Haploxerolic Durothids, loamy-skeletal, mixed, mesic, shallow—35 percent
• Shabliss gravelly loam, 30 to 50 percent slopes—Haploxerolic Durothids, loamy, mixed, mesic, shallow—30 percent
• Blackhawk gravelly loam, 30 to 50 percent slopes—Entic Durothids, loamy, mixed, mesic, shallow—20 percent
Contrasting inclusions:
• Inclusion 1: Xeric Torriorthents cobbly loam, rarely flooded, 0 to 4 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcic), mesic—6 percent
• Inclusion 2: Haploxerolic Durothids gravelly loam, 30 to 50 percent slopes—Haploxerolic Durothids, loamy-skeletal, mixed, mesic—4 percent
• Inclusion 3: Hapludurargids gravelly loam, 2 to 8 percent slopes—Hapludurargids, loamy, mixed, mesic, shallow—4 percent
• Inclusion 4: Xerolic Hapludargids gravelly loam, 30 to 50 percent slopes—Xerolic Hapludargids, clayey-skeletal, mixed, mesic, shallow—1 percent

Characteristics of the Eastwell Soil
Position on landscape: Summits of fan piedmont remnants
Parent material: Mixed alluvium influenced by loess
Slope features: Length—short; shape—convex
Dominant present vegetation: Black sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—42

Typical profile
0 to 6 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
6 to 12 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC, GC; estimated AASHTO classification—A-1, A-2
12 to 20 inches—cemented layer; massive; very hard, very firm
20 to 60 inches—very gravelly loam; 15 to 45 percent cobbles and stones and 40 to 55 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-2, A-4

Soil and water features
Depth to a hardpan: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the cemented layer—moderate; below the cemented layer—moderately rapid
Available water capacity: 1.0 to 1.5 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Shabliss Soil
Position on landscape: North- and east-facing back slopes of partial ballenas
Parent material: Loess high in content of volcanic ash over mixed alluvium
Slope features: Length—long; shape—plane

Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

Typical profile
0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-4
3 to 19 inches—loam; 0 to 5 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
19 to 30 inches—cemented layer; massive; very hard, very firm
30 to 60 inches—very gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1

Soil and water features
Depth to a hardpan: 12 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Above the hardpan—moderate; below the hardpan—rapid
Available water capacity: 3.6 to 4.6 inches
Water-supplying capacity: About 8 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.28; T value—2; wind erodibility group—6
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Moderate

Characteristics of the Blackhawk Soil
Position on landscape: South- and west-facing back slopes of partial ballenas
Parent material: Mixed alluvium influenced by loess and volcanic ash
Slope features: Length—long; shape—plane
Dominant present vegetation: Shadscale, bud sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel; percentage of surface covered—25

Typical profile

0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 25 to 30 percent pebbles (by weight); platy structure; slightly hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

3 to 14 inches—gravelly loam; 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-4

14 to 30 inches—cemented layer; platy structure; very hard, very firm

30 to 48 inches—very gravelly fine sandy loam; 60 to 75 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—GP, GW; estimated AASHTO classification—A-1

48 to 60 inches—extremely gravelly coarse sand; 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—GP, GW; estimated AASHTO classification—A-1

Soil and water features

Depth to a hardpan: 12 to 20 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Above the cemented layer—moderate; below the cemented layer—rapid

Available water capacity: 3.6 to 4.1 inches

Water-supplying capacity: About 6 inches

Runoff: Rapid

Hydrologic group: D

Erosion factors (surface layer): K value—.37; T value—1; wind erodibility group—6

Hazard of erosion: By water—severe; by wind—slight

Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Low

Contrasting Inclusions

Inclusion 1

Position on landscape: Inset fans adjacent to channels

Distinctive present vegetation: Basin wildrye, basin big sagebrush

Inclusion 2

Position on landscape: Concave, south- and west-facing back slopes of partial ballenas and fan piedmont remnants

Distinctive present vegetation: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 3

Position on landscape: Convex crests of partial ballenas

Distinctive present vegetation: Bottlebrush squirreltail, shadscale, bud sagebrush

Inclusion 4

Position on landscape: The upper part of north- and east-facing side slopes on fan piedmont remnants and partial ballenas

Distinctive present vegetation: Wyoming big sagebrush, spiny hogsage

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Eastwell soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Shabliss soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Blackhawk soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Eastwell soil for selected uses and practices

Range seeding: Poor—too crusty, small stones, droughty

Daily cover for landfill: Poor—cemented pan, small stones

Shallow excavations: Severe—cemented pan

Local roads and streets: Moderate—cemented pan, large stones

Roadfill: Fair—large stones

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Topsoil: Poor—cemented pan, small stones, area reclaim

Pond reservoir areas: Severe—seepage, cemented pan

Embankments, dikes, and levees: Moderate— piping, large stones

Ratings and restrictive features of the Shabliss soil for selected uses and practices

Range seeding: Poor—droughty, too crusty, erodes easily
Daily cover for landfill: Poor—cemented pan, small stones, slope
Shallow excavations: Severe—cemented pan, cutbanks cave, slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan, small stones, area reclaim
Pond reservoir areas: Severe—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the Blackhawk soil for selected uses and practices
Range seeding: Poor—too arid, too crusty, erodes easily
Daily cover for landfill: Poor—cemented pan, small stones, slope
Shallow excavations: Severe—cemented pan, cutbanks cave, slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Probable source
Gravel: Probable source
Topsoil: Poor—small stones, slope, cemented pan
Pond reservoir areas: Severe—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—seepage, excess salt

Interpretive Groups
Capability classification: Eastwell—VIIa, nonirrigated; Shabliss—VIIb, nonirrigated; Blackhawk—Vile, nonirrigated
Range site: Eastwell—024X030N; Shabliss—024X020N; Blackhawk—024X025N

1551—Eastwell, moderately steep-Shabliss-Eastwell association

Map Unit Setting
Position on landscape: Fan piedmont remnants
Elevation: 4,500 to 6,000 feet
Average annual precipitation: About 9 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

Composition
Major components:
• Eastwell very gravelly loam, 15 to 30 percent slopes—Haploxerolic Durorthids, loamy-skeletal, mixed, mesic, shallow—25 percent
• Eastwell very gravelly loam, 2 to 8 percent slopes—Haploxerolic Durorthids, loamy-skeletal, mixed, mesic, shallow—20 percent
Contrasting inclusions:
• Inclusion 1: Trunk cobbly loam, 15 to 30 percent slopes—Xeric Hapludands, fine, montmorillonitic, mesic—9 percent
• Inclusion 2: Fluventic Hapludolls loam, 0 to 4 percent slopes—Fluventic Hapludolls, fine-loamy, mixed, mesic—1 percent

Characteristics of the Moderately Steep Eastwell Soil

Position on landscape: South-facing side slopes of fan piedmont remnants
Parent material: Mixed alluvium influenced by loess
Slope features: Length—long; shape—plane
Dominant present vegetation: Black sagebrush, Sandberg bluegrass
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—42

Typical profile
0 to 6 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
6 to 12 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC, GC; estimated AASHTO classification—A-1, A-2
12 to 20 inches—cemented layer; massive; very hard, very firm
20 to 60 inches—very gravelly loam; 15 to 45 percent cobbles and stones and 40 to 55 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-2, A-4

Soil and water features
Depth to a hardpan: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None  
Permeability: Above the cemented layer—moderate; below the cemented layer—moderately rapid  
Available water capacity: 1.0 to 1.5 inches  
Water-supplying capacity: About 8 inches  
Runoff: Rapid  
Hydrologic group: D  
Erosion factors (surface layer): K value—.15; T value—2; wind erodibility group—7  
Hazard of erosion: By water—moderate; by wind—slight  
Shrink-swell potential: Low  
Corrosivity: To steel—high; to concrete—low  
Potential for frost action: Low  

**Characteristics of the Shabliss Soil**  
Position on landscape: North-facing fan remnants  
Parent material: Loess high in content of volcanic ash over mixed alluvium  
Slope features: Length—long; shape—plane  
Dominant present vegetation: Wyoming big sagebrush, spiny hopsage, bottlebrush squirreltail  
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30  

**Typical profile**  
0 to 3 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-4  
3 to 19 inches—loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4  
19 to 30 inches—strongly cemented hardpan; massive; very hard, very firm  
30 to 60 inches—very gravelly loamy sand; 0 to 15 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GM; estimated AASHTO classification—A-1  

**Soil and water features**  
Depth to a hardpan: 12 to 20 inches  
Depth to a seasonal high water table: More than 60 inches  
Flooding: None  
Permeability: Above the hardpan—moderate; below the hardpan—rapid  
Available water capacity: 3.6 to 4.6 inches  
Water-supplying capacity: About 8 inches  
Runoff: Medium  
Hydrologic group: D  
Erosion factors (surface layer): K value—.28; T value—2; wind erodibility group—6  
Hazard of erosion: By water—moderate; by wind—slight  
Shrink-swell potential: Low  
Corrosivity: To steel—high; to concrete—low  
Potential for frost action: Moderate  

**Characteristics of the Less Sloping Eastwell Soil**  
Position on landscape: Summits of fan piedmont remnants  
Parent material: Mixed alluvium influenced by loess  
Slope features: Length—short; shape—convex  
Dominant present vegetation: Black sagebrush, Sandberg bluegrass  
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—42  

**Typical profile**  
0 to 6 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
6 to 12 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC, GC; estimated AASHTO classification—A-1, A-2  
12 to 20 inches—cemented layer; massive; very hard, very firm  
20 to 60 inches or more—very gravelly loam; 15 to 45 percent cobbles and stones and 40 to 55 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-2, A-4  

**Soil and water features**  
Depth to a hardpan: 10 to 20 inches  
Depth to a seasonal high water table: More than 60 inches  
Flooding: None  
Permeability: Above the cemented layer—moderate; below the cemented layer—moderately rapid  
Available water capacity: 1.0 to 1.5 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—1.5; T value—2; wind erodibility group—7
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Residual hills protruding through the fan piedmonts
Distinctive present vegetation: Thurber needlegrass, Wyoming big sagebrush

Inclusion 2
Position on landscape: Inset fans adjacent to stream channels
Distinctive present vegetation: Basin wildrye, basin big sagebrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the moderately steep Eastwell soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Shabliiss soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the less sloping Eastwell soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the moderately steep Eastwell soil for selected uses and practices

Range seeding: Poor—too crusty, small stones, droughty
Daily cover for landfill: Poor—cemented pan, small stones, slope
Shallow excavations: Severe—cemented pan, cutbanks, slope
Local roads and streets: Severe—slope
Roadfill: Fair—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan, small stones, area reclaim
Pond reservoir areas: Severe—seepage, cemented pan, slope
Embankments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the less sloping Eastwell soil for selected uses and practices

Range seeding: Poor—too crusty, small stones, droughty
Daily cover for landfill: Poor—cemented pan, small stones
Shallow excavations: Severe—cemented pan
Local roads and streets: Moderate—cemented pan, large stones
Roadfill: Fair—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—cemented pan, small stones, area reclaim
Pond reservoir areas: Severe—seepage, cemented pan
Embankments, dikes, and levees: Moderate—piping, large stones

Interpretive Groups

Capability classification: Eastwell, moderately steep—Ville, nonirrigated; Shabliiss—Ville, nonirrigated; the less sloping Eastwell—VIIIs, nonirrigated
Range site: Eastwell, moderately steep—024X030N; Shabliiss—024X020N; the less sloping Eastwell—024X030N

1560—Denay-Wereld-Xine association

Map Unit Setting

Position on landscape: Mountains
Elevation: 6,000 to 7,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 85 days
Composition

Major components:
- Denay gravelly loam, 30 to 50 percent slopes—Aridic Calcixerolls, loamy-skeletal, mixed, frigid—40 percent
- Wereld very gravelly silt loam, 30 to 50 percent slopes—Aridic Calcixerolls, loamy-skeletal, mixed, frigid—25 percent
- Xine very gravelly loam, 30 to 50 percent slopes—Aridic Calcixerolls, loamy-skeletal, mixed, frigid—20 percent

Contrasting inclusions:
- Inclusion 1: Mulhop very gravelly loam, 30 to 50 percent slopes—Lithic Xerollic Calcisols, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Cleavage extremely gravelly loam, 4 to 30 percent slopes—Lithic Argixerolls, loamy-skeletal, mixed, frigid—4 percent
- Inclusion 4: Aridic Haploxerolls very gravelly loam, 30 to 50 percent slopes—Aridic Haploxerolls, loamy-skeletal, mixed, frigid—1 percent

Characteristics of the Denay Soil

Position on landscape: South-facing side slopes of mountains

Parent material: Kind—residuum influenced by loess; source—limestone, shale

Slope features: Length—long; shape—convex

Dominant present vegetation: Mountain big sagebrush, basin wildrye, rabbitbrush

Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—30

Typical profile

0 to 10 inches—gravelly loam; 0 to 5 percent cobbles and stones and 30 to 50 percent pebbles (by weight); granular structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-4

10 to 44 inches—extremely gravelly loam; 0 to 5 percent cobbles and stones and 75 to 85 percent pebbles (by weight); massive; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

44 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 40 to 60 inches

Depth to a seasonal high water table: More than 60 inches

Flooding: None

Permeability: Moderately slow

Available water capacity: 4.5 to 5.4 inches

Water-supplying capacity: About 12 inches

Runoff: Rapid

Hydrologic group: B

Erosion factors (surface layer): K value—.24; T value—3; wind erodibility group—7

Hazard of erosion: By water—severe; by wind—slight

Shrink-swell potential: Low

Corrosivity: To steel—high; to concrete—low

Potential for frost action: Moderate

Characteristics of the Wereld Soil

Position on landscape: North-facing side slopes of mountains

Parent material: Kind—residuum; source—limestone, shale

Slope features: Length—long; shape—convex

Dominant present vegetation: Black sagebrush, Cusick bluegrass, Idaho fescue

Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—47

Typical profile

0 to 3 inches—very gravelly silt loam; 0 to 10 percent cobbles and stones and 50 to 65 percent pebbles (by weight); granular structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-4

3 to 10 inches—gravelly silt loam; 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, ML; estimated AASHTO classification—A-4

10 to 25 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 55 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2, A-4

25 to 42 inches—very gravelly loam; 0 to 15 percent cobbles and stones and 65 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
42 inches—unweathered bedrock

**Soil and water features**

*Depth to bedrock:* 40 to 60 inches  
*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 2.8 to 3.9 inches  
*Water-supplying capacity:* About 13 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—1.7, T value—2; wind erodibility group—G  
*Hazard of erosion:* By water—severe, by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* To steel—high, to concrete—low  
*Potential for frost action:* Moderate  

**Characteristics of the Xine Soil**

*Position on landscape:* North- and east-facing side slopes of mountains  
*Parent material:* Kind—residual; source—limestone, shale  
*Slope features:* Length—long, shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue  
*Rock fragments on the surface:* Kind—gravel, cobbles, stones; percentage of surface covered—50

**Typical profile**

0 to 10 inches—very gravelly loam; 0 to 5 percent cobbles and stones and 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
10 to 38 inches—very cobbly loam; 35 to 50 percent cobbles and stones and 35 to 60 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4, A-1  
38 inches—weathered bedrock  

**Soil and water features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to a seasonal high water table:* More than 60 inches  
*Flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 3.0 to 4.1 inches  
*Water-supplying capacity:* About 11 inches  

**Contrasting Inclusions**

**Inclusion 1**

*Position on landscape:* The upper part of side slopes on mountains  
*Distinctive present vegetation:* Utah juniper  

**Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges  
*Distinctive present vegetation:* Barren  

**Inclusion 3**

*Position on landscape:* Crests and shoulder slopes of mountains  
*Distinctive present vegetation:* Idaho fescue, low sagebrush  

**Inclusion 4**

*Position on landscape:* The lower part of mountain crests  
*Distinctive present vegetation:* Curlleaf mountain mahogany  

**Other minor inclusions**

• Areas on toe slopes adjacent to channels on mountains  
• Areas on concave, north-facing side slopes of mountains  

**Major Uses**

*Current uses:* Wildlife habitat, rangeland  

**Wildlife habitat elements**

*Suitability of the Denay soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Wereld soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Suitability of the Xine soil for named elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  

**Ratings and restrictive features of the Denay soil for selected uses and practices**

*Range seeding:* Poor—eroses easily  
*Daily cover for landfill:* Poor—small stones, slope  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—seepage

Ratings and restrictive features of the Wereld soil for selected uses and practices
Range seeding: Poor—erodes easily, small stones
Daily cover for landfill: Poor—small stones, slope
Shallow excavations: Severe—slope
Local roads and streets: Severe—slope
Roadfill: Poor—slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim, slope
Pond reservoir areas: Severe—slope
Embankments, dikes, and levees: Severe—seepage

Contrasting inclusions:
- Inclusion 1: Xeric Torriorthents loam, 30 to 50 percent slopes—Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 2: Xeric Torriulvent soil, 0 to 2 percent slopes—Xeric Torriulvent, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 3: Typic Torriulvent sandy loam, 0 to 2 percent slopes—Typic Torriulvent, sandy, mixed, mesic—3 percent
- Inclusion 4: Typic Torriulvent silty loam, 0 to 2 percent slopes—Typic Torriulvent, fine-loamy, mixed (calcareous), mesic—2 percent

Characteristics of the Pocker Variant Soil
Position on landscape: Flood plains
Parent material: Mixed alluvium
Slope features: Length—long; shape—smooth
Dominant present vegetation: Basin big sagebrush, inland saltgrass, willow

Typical profile
0 to 2 inches—loam; 0 to 10 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
2 to 60 inches—stratified silt loam to very fine sandy loam; 0 to 10 percent pebbles (by weight); massive; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4

Soil and water features
Depth to a seasonal high water table (artificially lowered): 18 to 24 inches
Flooding: None
Permeability: Moderate
Available water capacity: 10.8 to 11.9 inches
Water-supplying capacity: About 16 inches
Runoff: Slow
Hydrologic group: C
Erosion factors (surface layer): K value—.55; T value—5; wind erodibility group—4L
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: High

Interpretive Groups
Capability classification: Deny—VII, nonirrigated;
Wereld—VII, nonirrigated; Xine—VII, nonirrigated
Range site: Deny—024X029N; Wereld—024X042N;
Xine—024X021N

1570—Pocker Variant loam, wet

Map Unit Setting
Position on landscape: Flood plains
Elevation: 3,700 to 4,200 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

Composition
Major component:
- Pocker Variant loam, wet, 0 to 2 percent slopes—
Aque Xerorthent, coarse-silty, mixed (calcereous), mesic—85 percent

Inclusion 1
Position on landscape: Escarpments adjacent to flood plains
Distinctive present vegetation: Quaking aspen

Inclusion 2
Position on landscape: Stream terraces
Distinctive present vegetation: Black greasewood

Inclusion 3
Position on landscape: Concave inset fans
Distinctive present vegetation: Littleleaf horsebrush, rubber rabbitbrush

Inclusion 4
Position on landscape: Edges of active flood plains
Distinctive present vegetation: Torrey quailbush

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Pocker Variant soil for named elements:
- Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Pocker Variant soil for selected uses and practices

Range seeding: Good
Daily cover for landfill: Fair—wetness
Shallow excavations: Severe—wetness
Local roads and streets: Severe—frost action
Roadfill: Fair—wetness
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Good
Pond reservoir areas: Moderate—seepage
Embankments, dikes, and levees: Severe—piping, wetness
Drainage: Frost action
Irrigation: Erodes easily, wetness
Terraces and diversions: Erodes easily, wetness

Interpretive Groups
Capability classification: IIIw, irrigated, and VIw, nonirrigated
Range site: 025X001N

1640—Isole-Paran-Appian association

Map Unit Setting
Position on landscape: Lake plains, sand dunes
Elevation: 3,900 to 4,000 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 120 days

Composition
Major components:
- Isole fine sand, 4 to 15 percent slopes—Typic Torripsamments, mixed, mesic—45 percent
- Parra silty clay, 0 to 2 percent slopes—Typic Salortheds, fine, montmorillonitic, mesic—20 percent
- Appian sandy loam, moderately saline-sodic, 0 to 2 percent slopes—Typic Natarrgids, fine-loamy over sandy or sandy-skeletal, mixed, mesic—20 percent

Contrasting inclusions:
- Inclusion 1: Playas—5 percent
- Inclusion 2: Typic Torriorthents fine sandy loam, 4 to 15 percent slopes—Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic—5 percent
- Inclusion 3: Hawley sand, 2 to 8 percent slopes—Typic Torripsamments, mixed, mesic—3 percent
- Inclusion 4: Trocken fine sandy loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—2 percent

Characteristics of the Isole Soil
Position on landscape: Sand dunes
Parent material: Sandy eolian material
Slope features: Length—short; shape—convex
Dominant present vegetation: Black greasewood, hairy horsebrush, Indian ricegrass

Typical profile
0 to 1 inch—fine sand; single grain; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3
1 to 60 inches—fine sand; single grain; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very rapid
Available water capacity: 3.6 to 5.4 inches
Water-supplying capacity: About 4 inches
Runoff: Very slow
Hydrologic group: A
Erosion factors (surface layer): K value—.28; T value—5; wind erodibility group—1
Hazard of erosion: By water—slight; by wind—severe
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low
Characteristics of the Parran Soil

Position on landscape: Interdune lake plain terraces
Parent material: Mixed lacustrine sediments
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Black greasewood, seepweed
Rock fragments on the surface: Kind—gravel; percentage of surface covered—1

Typical profile

0 to 7 inches—silty clay; platy structure; hard, firm; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CH, CL; estimated AASHTO classification—A-7
7 to 26 inches—silty clay; massive; soft, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CH, CL; estimated AASHTO classification—A-7
26 to 60 inches—silty clay; massive; very hard, firm; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CH, CL; estimated AASHTO classification—A-7

Soil and water features

Depth to a seasonal high water table: November through March—30 to 42 inches; rest of year—more than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 8.4 to 9.6 inches
Water-supplying capacity: About 10 inches
Runoff: Pondered
Hydrologic group: D
Erosion factors (surface layer): K value—.37; T value—5; wind erodibility group—4
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—high
Potential for frost action: High

Characteristics of the Appian Soil

Position on landscape: Lake plain terraces
Parent material: Mixed alluvium over sandy lacustrine deposits
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Black greasewood, seepweed
Rock fragments on the surface: Kind—gravel; percentage of surface covered—5

Typical profile

0 to 4 inches—sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
4 to 9 inches—sandy clay loam; 0 to 10 percent pebbles (by weight); prismatic structure; hard, firm; very strongly alkaline (pH 9.4); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—SC, CL; estimated AASHTO classification—A-6, A-7
9 to 25 inches—stratified sandy loam to sand; 10 to 25 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—SM; estimated AASHTO classification—A-2
25 to 56 inches—sand; 10 to 25 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP, SP-PM; estimated AASHTO classification—A-1
56 to 60 inches—silt loam; massive; slightly hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, ML; estimated AASHTO classification—A-4

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 4.0 to 5.6 inches
Water-supplying capacity: About 4 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.24; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—moderate
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Depressions on the lower lake plains
Distinctive present vegetation: Barren
Inclusion 2
Position on landscape: Convex parna dunes
Distinctive present vegetation: Black greasewood

Inclusion 3
Position on landscape: Smooth beach plains
Distinctive present vegetation: Fourwing saltbush, Bailey greasewood

Inclusion 4
Position on landscape: Convex offshore bars
Distinctive present vegetation: Bluegrass, shadscale

Major Uses
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements
Suitability of the Islolde soil for named elements: Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Parran soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Appian soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Islolde soil for selected uses and practices
Range seeding: Poor—too arid, soil blowing
Daily cover for landfill: Poor—seepage, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—slope
Roadfill: Good
Sand: Probable source
Gravel: Improbable source—too sandy
Topsoil: Poor—too sandy
Pond reservoir areas: Severe—seepage, slope
Embankments, dikes, and levees: Severe—seepage, piping
Drainage: Deep to water
Irrigation: Droughty, fast intake, soil blowing
Terraces and diversions: Slope, droughty, soil blowing

Ratings and restrictive features of the Parran soil for selected uses and practices
Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—hard to pack
Shallow excavations: Moderate—too clayey, wetness
Local roads and streets: Severe—low strength, frost action, shrink-swell
Roadfill: Poor—low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—too clayey, excess salt
Pond reservoir areas: Slight
Embankments, dikes, and levees: Severe—excess salt

Ratings and restrictive features of the Appian soil for selected uses and practices
Range seeding: Poor—too arid, excess salt, excess sodium
Daily cover for landfill: Poor—seepage, too sandy
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—thin layer
Gravel: Improbable source—too sandy
Topsoil: Poor—excess salt, excess sodium, too sandy
Pond reservoir areas: Severe—seepage
Embankments, dikes, and levees: Severe—seepage, excess salt, excess sodium

Interpretive Groups
Capability classification: Islolde—IVs, irrigated, and VIIIs, nonirrigated; Parran—VIIw, nonirrigated; Appian—VIIw, nonirrigated
Range site: Islolde—027X016N; Parran—027X025N; Appian—027X024N

1650—Bango-Appian association

Map Unit Setting
Position on landscape: Lake plain terraces
Elevation: 3,900 to 4,100 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 52 degrees F
Frost-free period: About 120 days

Composition
Major components:
• Bango very gravelly loamy sand, 2 to 8 percent slopes—Haplic Natrargids, fine-loamy, mixed, mesic—50 percent
• Appian loam, 0 to 2 percent slopes—Typic Natrargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic—35 percent
Contrasting inclusions:
• Inclusion 1: Badland—5 percent
• Inclusion 2: Biddleman gravelly sandy loam, 4 to 15 percent slopes—Typic Natrargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic—5 percent
• Inclusion 3: Trocken very cobbly sandy loam, 2 to 8 percent slopes—Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—3 percent
• Inclusion 4: Lithic Torriorthents very gravelly sandy loam, 4 to 15 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—2 percent
Characteristics of the Bango Soil

Position on landscape: Low-lying lake plain terraces
Parent material: Mixed lacustrine sediments
Slope features: Length—long; shape—smooth
Dominant present vegetation: Bailey greasewood, shadscale, bud sagebrush
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—45

Typical profile

0 to 5 inches—very gravelly loamy sand; 0 to 5 percent cobbles and stones and 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

5 to 9 inches—loam; 0 to 5 percent cobbles and stones and 0 to 10 percent pebbles (by weight); prismatic structure; hard, friable; moderately alkaline (pH 8.2); slightly saline (4 to 8 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—CL; estimated AASHTO classification—A-6

9 to 60 inches—stratified gravelly fine sandy loam to silt loam; 0 to 5 percent cobbles and stones and 5 to 15 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); slightly sodic or moderately sodic (SAR 13 to 45); estimated Unified classification—CL; estimated AASHTO classification—A-6

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 8.4 to 9.2 inches
Water-supplying capacity: About 4 inches
Runoff: Slow
Hydrologic group: B
Erosion factors (surface layer): K value—.37; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Characteristics of the Appian Soil

Position on landscape: Lake plain terraces
Parent material: Mixed alluvium over sandy lacustrine deposits
Slope features: Length—long; shape—concave

Dominant present vegetation: Bailey greasewood, shadscale, bud sagebrush
Rock fragments on the surface: Kind—gravel; percentage of surface covered—5

Typical profile

0 to 4 inches—loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (2 to 4 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

4 to 9 inches—sandy clay loam; 0 to 10 percent pebbles (by weight); prismatic structure; hard, firm; very strongly alkaline (pH 9.4); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—SC, CL; estimated AASHTO classification—A-6, A-7

9 to 25 inches—stratified sandy loam to sand; 10 to 25 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2

25 to 60 inches—sand; 10 to 25 percent pebbles (by weight); single grain; loose; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP, SP-SPM; estimated AASHTO classification—A-1

Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 4.0 to 5.6 inches
Water-supplying capacity: About 4 inches
Runoff: Very slow
Hydrologic group: B
Erosion factors (surface layer): K value—.37; T value—2; wind erodibility group—3
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Deeply dissected lake plain terrace breaks
Distinctive present vegetation: Barren

Inclusion 2
Position on landscape: Convex, highly dissected lake plain terrace breaks
Distinctive present vegetation: Black greasewood, seemeed

Inclusion 3

Position on landscape: Concave inset fans adjacent to channels

Distinctive present vegetation: Seepweed

Inclusion 4

Position on landscape: The upper part of lake plain terraces

Distinctive present vegetation: Indian ricegrass, shadscale

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Bango soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Suitability of the Appian soil for named elements: Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Bango soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium

Daily cover for landfill: Good

Shallow excavations: Slight

Local roads and streets: Moderate—low strength, shrink-swell

Roadfill: Fair—low strength, shrink-swell

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Topsoil: Poor—excess sodium

Pond reservoir areas: Moderate—slope

Embankments, dikes, and levees: Severe—excess sodium

Ratings and restrictive features of the Appian soil for selected uses and practices

Range seeding: Poor—too arid, excess salt, excess sodium

Daily cover for landfill: Poor—seepage, too sandy

Shallow excavations: Severe—cutbanks cave

Local roads and streets: Slight

Roadfill: Good

Sand: Probable source

Gravel: Improbable source—too sandy

Topsoil: Poor—excess salt, excess sodium, too sandy

Pond reservoir areas: Severe—seepage

Embankments, dikes, and levees: Severe—seepage, excess sodium

Drainage: Deep to water

Irrigation: Droughty, excess sodium

Terraces and diversions: Erodes easily, too sandy

Interpretive Groups

Capability classification: Bango—VII, nonirrigated; Appian—III, irrigated, and VII, nonirrigated

Range site: Bango—027X018N; Appian—027X018N

1660—Biddlemann-Trocken-Biddlemann, stony, association

Map Unit Setting

Position on landscape: Beach plains, fan skirts

Elevation: 4,000 to 4,300 feet

Average annual precipitation: About 6 inches

Average annual air temperature: About 51 degrees F

Frost-free period: About 120 days

Composition

Major components:

- Biddlemann gravelly sandy loam, 2 to 4 percent slopes—Typic Natrargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic—35 percent
- Trocken gravelly very fine sandy loam, 2 to 8 percent slopes—Typic Torrithents, loamy-skeletal, mixed (calcareous), mesic—35 percent
- Biddlemann very stony sandy loam, 2 to 8 percent slopes—Typic Natrargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic—15 percent

Contrasting inclusions:

- Inclusion 1: Bluwing very cobbly loamy sand, frequently flooded, 2 to 8 percent slopes—Typic Torrithents, sandy-skeletal, mixed, mesic—9 percent
- Inclusion 2: Chiper gravelly sandy loam, 2 to 8 percent slopes—Duric Natrargids, fine, montmorillonitic, mesic—4 percent
- Inclusion 3: Rock outcrop—2 percent

Characteristics of the Gravelly Biddlemann Soil

Position on landscape: The lower part of beach terraces adjacent to escarpments

Parent material: Loamy alluvium over lacustrine material

Slope features: Length—long; shape—slightly convex

Dominant present vegetation: Black greasewood

Rock fragments on the surface: Kind—gravel; percentage of surface covered—20

Typical profile

0 to 3 inches—gravelly sandy loam; 5 to 10 percent cobbles and stones and 30 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); strongly saline (more than 16 mmhos/cm); moderately sodic (SAR
24 to 46; estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
3 to 13 inches—gravelly loam; 0 to 5 percent cobbles and stones and 35 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); slightly saline or moderately saline (4 to 16 mmhos/cm); moderately sodic (SAR 24 to 46); estimated Unified classification—SC, GC; estimated AASHTO classification—A-2, A-6
13 to 60 inches—stratified extremely gravelly loamy fine sand to coarse sand; 5 to 15 percent cobbles and stones and 80 to 90 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—GP; estimated AASHTO classification—A-1

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Moderately slow
*Available water capacity:* 2.9 to 4.1 inches
*Water-supplying capacity:* About 6 inches
*Runoff:* Slow
*Hydrologic group:* B
*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—4
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* Moderate
*Corrosivity:* To steel—high; to concrete—high
*Potential for frost action:* Low

**Characteristics of the Trocken Soil**

*Position on landscape:* Fan skirts, offshore bars
*Parent material:* Mixed alluvium
*Slope features:* Length—long; shape—convex
*Dominant present vegetation:* Shadscale, bud sagebrush, pine bluegrass
*Rock fragments on the surface:* Kind—gravel, cobbles; percentage of surface covered—30

**Typical profile**

0 to 3 inches—very stony sandy loam; 15 to 30 percent cobbles and stones and 30 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
3 to 13 inches—gravelly loam; 0 to 5 percent cobbles and stones and 35 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, GC; estimated AASHTO classification—A-2, A-4
3 to 60 inches—stratified extremely gravelly loamy coarse sand to very cobbly loam; 5 to 40 percent cobbles and stones and 60 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC, GP-GC; estimated AASHTO classification—A-2

**Soil and water features**

*Depth to a seasonal high water table:* More than 60 inches
*Flooding:* None
*Permeability:* Moderate
*Available water capacity:* 3.0 to 4.8 inches
*Water-supplying capacity:* About 6 inches
*Runoff:* Medium
*Hydrologic group:* B
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—4
*Hazard of erosion:* By water—slight; by wind—slight
*Shrink-swell potential:* Low
*Corrosivity:* To steel—high; to concrete—high
*Potential for frost action:* Low

**Characteristics of the Stony Biddleman Soil**

*Position on landscape:* The upper part of beach terraces
*Parent material:* Loamy alluvium over lacustrine material
*Slope features:* Length—long; shape—convex
*Dominant present vegetation:* Bailey greasewood, shadscale, bud sagebrush, seepweed
*Rock fragments on the surface:* Kind—gravel, stones; percentage of surface covered—22

**Typical profile**

0 to 3 inches—very stony sandy loam; 15 to 30 percent cobbles and stones and 30 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
3 to 13 inches—gravelly loam; 0 to 5 percent cobbles and stones and 35 to 45 percent pebbles (by weight); prismatic structure; hard, firm; strongly alkaline (pH 9.0); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—SC, GC; estimated AASHTO classification—A-2, A-6
13 to 60 inches—stratified extremely gravelly loamy fine sand to coarse sand; 5 to 15 percent cobbles and stones and 80 to 90 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1
Soil and water features

Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 2.9 to 4.1 inches
Water-supplying capacity: About 6 inches
Runoff: Medium
Hydrologic group: B
Erosion factors (surface layer): K value—.32; T value—1; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—high; to concrete—high
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Drainageways
Distinctive present vegetation: Nevada ephedra

Inclusion 2
Position on landscape: Convex fan piedmont remnants adjacent to beach plains
Distinctive present vegetation: Bluegrass, shadscale

Inclusion 3
Position on landscape: Escarpments
Distinctive present vegetation: Barren

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the gravelly Biddleman soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Trocken soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the stony Biddleman soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the gravelly
Biddleman soil for selected uses and practices

Range seeding: Poor—to arid, excess salt, excess sodium
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—small stones
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, excess salt, excess sodium
Pond reservoir areas: Severe—seepage
Embarkments, dikes, and levees: Severe—seepage, excess salt, excess sodium

Ratings and restrictive features of the Trocken soil
for selected uses and practices

Range seeding: Poor—to arid, too crusty
Daily cover for landfill: Poor—small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Moderate—large stones
Roadfill: Fair—large stones
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—small stones, area reclaim
Pond reservoir areas: Moderate—seepage, slope
Embarkments, dikes, and levees: Severe—large stones

Ratings and restrictive features of the stony
Biddleman soil for selected uses and practices

Range seeding: Poor—to arid, large stones, excess salt
Daily cover for landfill: Poor—seepage, too sandy, small stones
Shallow excavations: Severe—cutbanks cave
Local roads and streets: Slight
Roadfill: Good
Sand: Improbable source—small stones
Gravel: Probable source
Topsoil: Poor—small stones, area reclaim, excess sodium, too sandy
Pond reservoir areas: Severe—seepage
Embarkments, dikes, and levees: Severe—seepage, excess sodium

Interpretive Groups

Capability classification: Biddleman, gravelly—VIIs, nonirrigated; Trocken—VIIs, nonirrigated; Biddleman, stony—VIIs, nonirrigated
Range site: Biddleman, gravelly—027X025N; Trocken—027X028N; Biddleman, stony—027X030N

3000—Jobpeak-Teguro-Rock outcrop association

Map Unit Setting

Position on landscape: Mountains
Elevation: 6,000 to 7,500 feet
Average annual precipitation: About 13 inches
Average annual air temperature: About 46 degrees F
Frost-free period: About 90 days
Composition

Major components:
- Jobpeak very gravelly loam, 50 to 75 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic—40 percent
- Teguro very stony loam, 30 to 50 percent slopes—Lithic Argixerolls, loamy, mixed, frigid—30 percent
- Rock outcrop—15 percent

Contrasting inclusions:
- Inclusion 1: Singatse very gravelly loam, 30 to 50 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—5 percent
- Inclusion 2: Pachic Argixerolls very stony loam, 15 to 30 percent slopes—Pachic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 3: Lithic Xerollic Haplargids very gravelly loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey-skeletal, mixed, frigid—5 percent

Characteristics of the Jobpeak Soil

Position on landscape: South- and west-facing side slopes of mountains
Parent material: Kind—residuum; source—rhyolitic tuff
Slope features: Length—long; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones

Potential for frost action: Moderate

Characteristics of the Teguro Soil

Position on landscape: North- and east-facing side slopes of mountains
Parent material: Kind—residuum; source—rhyolitic tuff
Slope features: Length—long; shape—convex
Dominant present vegetation: Singleleaf pinyon, Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles, stones

Typical profile

0 to 2 inches—very stony loam; 10 to 25 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4
2 to 19 inches—gravelly loam; 0 to 10 percent cobbles and stones and 25 to 50 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6
19 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 14 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately slow
Available water capacity: 2.5 to 3.1 inches
Water-supplying capacity: About 10 inches
Runoff: Rapid
Hydrologic group: D

Erosion factors (surface layer): K value—20; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Moderate
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Characteristics of the Rock Outcrop

Position on landscape: The crests and upper side slopes of mountains
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex, south-facing foot slopes of mountains
Distinctive present vegetation: Bailey greasewood, shadscale

Inclusion 2

Position on landscape: Concave, north-facing side slopes of mountains

Distinctive present vegetation: Mountain big sagebrush

Inclusion 3

Position on landscape: Convex crests of mountains

Distinctive present vegetation: Singleleaf pinyon, Utah juniper

Major Uses

Current uses: Rangeland, wildlife habitat, woodland

Ratings of the Jobpeak soil for use as woodland

Site index for common trees: Singleleaf pinyon—25; Utah juniper—25

Most important native understory plants: Mountain big sagebrush, Sandberg bluegrass

Ratings of the Teguro soil for use as woodland

Site index for common trees: Singleleaf pinyon—55; Utah juniper—55

Most important native understory plants: Mountain big sagebrush, Sandberg bluegrass

Wildlife habitat elements

Suitability of the Jobpeak soil for named elements: Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Suitability of the Teguro soil for named elements: Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Jobpeak soil for selected uses and practices

Range seeding: Poor—droughty, small stones, depth to bedrock

Daily cover for landfill: Poor—depth to bedrock, slope

Shallow excavations: Severe—depth to bedrock, slope

Local roads and streets: Severe—depth to bedrock, slope

Roadfill: Poor—depth to bedrock, slope

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Topsoil: Poor—depth to bedrock, small stones, slope

Pond reservoir areas: Severe—depth to bedrock, slope

Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Teguro soil for selected uses and practices

Range seeding: Poor—small stones, erodes easily

Daily cover for landfill: Poor—depth to bedrock, small stones, slope

Shallow excavations: Severe—depth to bedrock, slope

Local roads and streets: Severe—depth to bedrock, slope

Roadfill: Poor—depth to bedrock, slope

Sand: Improbable source—excess fines

Gravel: Improbable source—excess fines

Topsoil: Poor—depth to bedrock, small stones, slope

Pond reservoir areas: Severe—depth to bedrock, slope

Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Jobpeak—VII, nonirrigated; Teguro—VIII, nonirrigated; Rock outcrop—VIII

Range site: Jobpeak—024X049N; Teguro—024X049N

Woodland suitability group: Jobpeak—3R; Teguro—2R

3010—Bedwyr-Bedzee-Jobpeak association

Map Unit Setting

Position on landscape: Mountains

Elevation: 5,200 to 6,300 feet

Average annual precipitation: About 10 inches

Average annual air temperature: About 51 degrees F

Frost-free period: About 110 days

Composition

Major components:

- Bedwyr stony loam, 15 to 30 percent slopes—Typic Natargids, clayey, montmorillonitic, mesic, shallow—50 percent
- Bedzee very stony loam, 15 to 30 percent slopes—Xerollic Haplorgids, clayey, montmorillonitic, mesic, shallow—20 percent
- Jobpeak very gravelly loam, 50 to 75 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic—15 percent

Contrasting inclusions:

- Inclusion 1: Lithic Xerollic Haplorgids very stony loam, 4 to 15 percent slopes—Lithic Xerollic Haplorgids, clayey, montmorillonitic, mesic, shallow—8 percent
- Inclusion 2: Rock outcrop—7 percent

Characteristics of the Bedwyr Soil

Position on landscape: Foot slopes and side slopes of mountains

Parent material: Kind—residuum; source—consolidated clayey lacustrine sediments that have a thin mantle of loess

Slope features: Length—long; shape—convex

Dominant present vegetation: Shadscale, bud sagebrush, pine bluegrass
Typical profile
0 to 3 inches—stony loam; 10 to 25 percent cobbles and stones and 25 to 40 percent pebbles (by weight); platy structure; slightly hard, friable; very strongly alkaline (pH 9.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-6

3 to 15 inches—clay; 0 to 10 percent pebbles (by weight); prismatic structure; very hard, firm; very strongly alkaline (pH 9.4); nonsaline or slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 23); estimated Unified classification—CH; estimated AASHTO classification—A-7

15 inches—weathered bedrock

Soil and water features

Depth to bedrock: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.0 to 2.4 inches
Water-supplying capacity: About 5 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.43; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—moderate
Potential for frost action: Moderate

Characteristics of the Jobpeak Soil

Position on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—basalt
Slope features: Length—long; shape—concave
Dominant present vegetation: Singleleaf pinyon, Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—70

Typical profile
0 to 5 inches—very gravelly loam; 15 to 30 percent cobbles and stones and 40 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4

5 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 4 to 12 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 0.3 to 0.5 inch
Water-supplying capacity: About 8 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Contrasting Inclusions

Inclusion 1
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Pine bluegrass, low sagebrush

Inclusion 2
Position on landscape: The crests and upper side slopes of mountains
Distinctive present vegetation: Barren

Major Uses

Current uses: Rangeland, wildlife habitat

Ratings of the Jobpeak soil for use as woodland

Site index for common trees: Singleleaf pinyon—25; Utah juniper—25
Most important native understory plants: Mountain big sagebrush, basin wildrye, Sandberg bluegrass

Wildlife habitat elements

Suitability of the Bedwyr soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor
Suitability of the Bedzee soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Jobpeak soil for named elements: Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the Bedwyr soil for selected uses and practices

Range seeding: Poor—too arid, droughty, large stones
Daily cover for landfill: Poor—depth to bedrock, hard to pack, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—low strength, slope, shrink-swell
Roadfill: Poor—depth to bedrock, low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, too clayey
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Jobpeak soil for selected uses and practices

Range seeding: Poor—droughty, small stones, depth to bedrock
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Bedwyr—V1e, nonirrigated; Bedzee—V1e, nonirrigated; Jobpeak—V1ls, nonirrigated
Range site: Bedwyr—027X028N; Bedzee—027X020N; Jobpeak—024X049N
Woodland suitability group: Jobpeak—3R

3020—Urpines-Rock outcrop association

Map Unit Setting

Position on landscape: Mountains
Elevation: 4,500 to 5,800 feet
Average annual precipitation: About 7 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 105 days

Composition

Major components:
- Urpines very stony sandy loam, 15 to 30 percent slopes—Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow—55 percent
- Rock outcrop—30 percent

Contrasting inclusions:
- Inclusion 1: Jobpeak very gravelly loam, 50 to 75
percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic—7 percent
• Inclusion 2: Xeric Torriorthents very stony sandy loam, 15 to 30 percent slopes—Xeric Torriorthents, loamy, mixed, nonacid, mesic—6 percent
• Inclusion 3: Xeric Torriorthents very cobbly sandy loam, 2 to 8 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic—2 percent

Characteristics of the Uripnes Soil

Position on landscape: Mountains
Parent material: Kind—residuum; source—granodiorite
Slope features: Length—long; shape—convex
Dominant present vegetation: Desert needlegrass, Indian ricegrass, littleleaf horsebrush
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—58

Typical profile
0 to 6 inches—very stony sandy loam; 20 to 35 percent cobbles and stones and 50 to 75 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1
6 to 22 inches—weathered bedrock
22 inches—unweathered bedrock

Soil and water features
Depth to bedrock: 3 to 8 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderately rapid
Available water capacity: 0.3 to 0.4 inch
Water-supplying capacity: About 6 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

Characteristics of the Rock Outcrop

Position on landscape: Scattered small peaks and ridges
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1
Position on landscape: Concave side slopes of mountains

Distinctive present vegetation: Singleleaf pinyon, Utah juniper

Inclusion 2
Position on landscape: Convex side slopes of mountains
Distinctive present vegetation: Pine bluegrass, Wyoming big sagebrush

Inclusion 3
Position on landscape: Channels
Distinctive present vegetation: Sandberg bluegrass, rubber rabbitbrush

Major Uses

Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the Uripnes soil for named elements: Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

Ratings and restrictive features of the Uripnes soil for selected uses and practices

Range seeding: Poor—depth to bedrock, large stones, too arid
Daily cover for landfill: Poor—depth to bedrock, slope
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—slope
Roadfill: Poor—depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—depth to bedrock, thin layer

Interpretive Groups

Capability classification: Uripnes—Vlls, nonirrigated; Rock outcrop—Vlls
Range site: Uripnes—027X017N

3030—Singatsale, very steep—Rock outcrop-Singatsale association

Map Unit Setting

Position on landscape: Mountains
Elevation: 4,500 to 6,500 feet
Average annual precipitation: About 5 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

Composition

Major components:
• Singatsale very gravelly loam, 50 to 75 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—40 percent
• Rock outcrop—30 percent
• Singatse very gravelly loam, 30 to 50 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed (calcareous), mesic—15 percent

**Contrasting inclusions:**
• Inclusion 1: Jobpeak very gravelly loam, 50 to 75 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic—6 percent
• Inclusion 2: Theon very gravelly loam, 15 to 30 percent slopes—Lithic Haplargids, loamy-skeletal, mixed, mesic—5 percent
• Inclusion 3: Lithic Xerolic Haplargids very gravelly loam, 4 to 15 percent slopes—Lithic Xerolic Haplargids, clayey-skeletal, mixed, mesic—2 percent
• Inclusion 4: Bluewing extremely gravelly loamy sand, frequently flooded, 2 to 8 percent slopes—Typic Torriorthents, sandy-skeletal, mixed, mesic—2 percent

**Characteristics of the Very Steep Singatse Soil**

**Position on landscape:** North-facing side slopes of mountains

**Parent material:** Kind—residuum; source—andesite, rhyolite, and, in some areas, granitic rocks

**Slope features:** Length—long; shape—convex

**Dominant present vegetation:** Shadscale, Bailey greasewood, bud sagebrush, Indian ricegrass

**Rock fragments on the surface:** Kind—gravel, cobbles; percentage of surface covered—35

**Typical profile**

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 45 to 55 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2

4 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

8 to 15 inches—weathered bedrock

15 inches—unweathered bedrock

**Soil and water features**

**Depth to bedrock:** 4 to 10 inches

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Moderate

**Available water capacity:** 0.7 to 1.0 inch

**Water-supplying capacity:** About 5 inches

**Runoff:** Very rapid

**Hydrologic group:** D

**Erosion factors (surface layer):** K value—17; T value—1; wind erodibility group—7

**Hazard of erosion:** By water—severe; by wind—slight

**Shrink-swell potential:** Low

**Corrosivity:** To steel—high; to concrete—low

**Potential for frost action:** Low

**Characteristics of the Rock Outcrop**

**Position on landscape:** Scattered small peaks and ridges

**Dominant present vegetation:** Barren

**Characteristics of the Less Sloping Singatse Soil**

**Position on landscape:** South-facing side slopes of mountains

**Parent material:** Kind—residuum; source—andesite, rhyolite, and, in some areas, granitic rocks

**Slope features:** Length—long; shape—convex

**Dominant present vegetation:** Shadscale, Bailey greasewood, bud sagebrush, Indian ricegrass

**Rock fragments on the surface:** Kind—gravel, cobbles, stones; percentage of surface covered—80

**Typical profile**

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 45 to 55 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

4 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

8 to 15 inches—weathered bedrock

15 inches—unweathered bedrock

**Soil and water features**

**Depth to bedrock:** 4 to 10 inches

**Depth to a seasonal high water table:** More than 60 inches

**Flooding:** None

**Permeability:** Moderate

**Available water capacity:** 0.7 to 1.0 inch

**Water-supplying capacity:** About 4 inches

**Runoff:** Rapid

**Hydrologic group:** D
Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—7
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

**Contrasting Inclusions**

**Inclusion 1**
Position on landscape: Concave side slopes of mountains
Distinctive present vegetation: Singleleaf pinyon, Utah juniper

**Inclusion 2**
Position on landscape: Convex foot slopes
Distinctive present vegetation: Desert needlegrass, shadscale

**Inclusion 3**
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Low sagebrush

**Inclusion 4**
Position on landscape: Concave toe slopes adjacent to channels
Distinctive present vegetation: Rubber rabbitbrush

**Major Uses**
Current uses: Rangeland, wildlife habitat

Wildlife habitat elements

Suitability of the very steep Singatse soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the less sloping Singatse soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

Ratings and restrictive features of the very steep Singatse soil for selected uses and practices
Range seeding: Poor—to arid, dry, erodes easily
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, slope, small stones
Pond reservoir areas: Severe—slope, depth to bedrock
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the less sloping Singatse soil for selected uses and practices
Range seeding: Poor—to arid, dry, depth to bedrock
Daily cover for landfill: Poor—slope, depth to bedrock
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, slope
Roadfill: Poor—depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, slope, small stones
Pond reservoir areas: Severe—slope, depth to bedrock
Embankments, dikes, and levees: Severe—thin layer

**Interpretive Groups**

**Capability classification:** Singatse, very steep—VIIa, nonirrigated; the less sloping Singatse—VIIa, nonirrigated; Rock outcrop—VIIa
Range site: Singatse, very steep—027X027N; the less sloping Singatse—027X027N

**3031—Singatse-Jobpeak-Rock outcrop association**

**Map Unit Setting**
Position on landscape: Mountains
Elevation: 4,500 to 6,500 feet
Average annual precipitation: About 8 inches
Average annual air temperature: About 50 degrees F
Frost-free period: About 110 days

**Composition**
Major components:
- Singatse very stony loam, 50 to 75 percent slopes—Lithic Torriorthents, loamy-skeletal, mixed (calcic), mesic—45 percent
- Jobpeak very gravelly loam, 50 to 75 percent slopes—Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic—25 percent
- Rock outcrop—20 percent

Contrasting inclusions:
- Inclusion 1: Tegu stony loam, 30 to 50 percent slopes—Lithic Argixerolls, loamy, mixed, frigid—5 percent
- Inclusion 2: Lithic Haplagichs very gravelly loam, 4 to 15 percent slopes—Lithic Haplagichs, clayey, montmorillonitic, mesic—3 percent
- Inclusion 3: Lithic Haplagichs very stony loam, 15 to 30 percent slopes—Lithic Haplagichs, loamy-skeletal, mixed, mesic—2 percent

**Characteristics of the Singatse Soil**
Position on landscape: Side slopes of mountains
Parent material: Kind—residuum; source—volcanic rocks
Slope features: Length—long; shape—convex
Dominant present vegetation: Shadscale, Bailey greasewood
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—35

Typical profile

0 to 4 inches—very stony loam; 40 to 50 percent cobbles and stones and 65 to 75 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

4 to 8 inches—very gravelly loam; 0 to 10 percent cobbles and stones and 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

8 to 15 inches—weathered bedrock

15 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 4 to 10 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 0.4 to 0.6 inch
Water-supplying capacity: About 7 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Characteristics of the Joppeak Soil

Position on landscape: Side slopes of mountains
Parent material: Kind—residuum, colluvium; source—volcanic rocks
Slope features: Length—long; shape—conave
Dominant present vegetation: Singleleaf pinyon, Utah juniper
Rock fragments on the surface: Kind—gravel, cobbles; percentage of surface covered—70

Typical profile

0 to 5 inches—very gravelly loam; 15 to 30 percent cobbles and stones and 40 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4

5 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 4 to 12 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Moderate
Available water capacity: 0.3 to 0.5 inch
Water-supplying capacity: About 7 inches
Runoff: Very rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—1; wind erodibility group—7
Hazard of erosion: By water—severe; by wind—slight
Shrink-swell potential: Low
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Moderate

Characteristics of the Joppeak Outcrop

Position on landscape: Scattered small peaks and ridges
Dominant present vegetation: Barren

Contrasting Inclusions

Inclusion 1
Position on landscape: Concave, north-facing side slopes of mountains
Distinctive present vegetation: Singleleaf pinyon, Utah juniper

Inclusion 2
Position on landscape: Convex crests of mountains
Distinctive present vegetation: Low sagebrush

Inclusion 3
Position on landscape: Convex, south-facing side slopes of mountains
Distinctive present vegetation: Desert needlegrass, shadscale

Major Uses

Current uses: Rangeland, wildlife habitat

Ratings of the Joppeak soil for use as woodland

Site index for common trees: Singleleaf pinyon—25; Utah juniper—25

Most important native understory plants: Mountain big sagebrush, Sandberg bluegrass

Wildlife habitat elements

Suitability of the Singatse soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
Suitability of the Jobpeak soil for named elements: Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; coniferous plants—poor

Ratings and restrictive features of the Singatse soil for selected uses and practices

Range seeding: Poor—to too arid, droughty, erodes easily
Daily cover for landfill: Poor—to depth to bedrock, slope
Shallow excavations: Severe—to depth to bedrock, slope
Local roads and streets: Severe—to depth to bedrock, slope
Roadfill: Poor—to depth to bedrock, slope
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—to small stones, slope, depth to bedrock
Pond reservoir areas: Severe—to depth to bedrock, slope
Embarkments, dikes, and levees: Severe—to thin layer

Ratings and restrictive features of the Jobpeak soil for selected uses and practices

Range seeding: Poor—to droughty, depth to bedrock, erodes easily
Daily cover for landfill: Poor—to depth to bedrock, slope
Shallow excavations: Severe—to depth to bedrock, slope
Local roads and streets: Severe—to depth to bedrock, slope
Roadfill: Poor—to slope, depth to bedrock
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—to small stones, slope, depth to bedrock
Pond reservoir areas: Severe—to depth to bedrock, slope
Embarkments, dikes, and levees: Severe—to thin layer

Interpretive Groups

Capability classification: Singatse—VIII(s), nonirrigated; Jobpeak—VIII(s), nonirrigated; Rock outcrop—VIII(s)
Range site: Singatse—027X027N; Jobpeak—024X049N
Woodland suitability group: Jobpeak—3R

3040—Madeline-Millerlux association

Map Unit Setting

Position on landscape: Plateaus
Elevation: 5,200 to 7,600 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days

Composition

Major components:
- Madeline very stony loam, 15 to 30 percent slopes—Lithic Xerollic Haplargids, clayey, montmorillonitic, frigid—30 percent
- Millerlux very stony loam, 4 to 15 percent slopes—Lithic Xerollic Haplargids, clayey, montmorillonitic, frigid—55 percent

Lithic Xerollic Haplargids, clayey, montmorillonitic, frigid—30 percent

Contrasting inclusions:
- Inclusion 1: Rock outcrop—6 percent
- Inclusion 2: Pachic Argixerolls loam, 30 to 50 percent slopes—Pachic Argixerolls, fine-loamy, mixed, frigid—5 percent
- Inclusion 3: Aridic Argixerolls loam, 4 to 15 percent slopes—Aridic Argixerolls, coarse-loamy, mixed, frigid—4 percent

Characteristics of the Madeline Soil

Position on landscape: Side slopes of plateaus
Parent material: Kind—residuum; source—basalt
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Mountain big sagebrush, snowberry, Thurber needlegrass
Rock fragments on the surface: Kind—gravels, cobbles, stones; percentage of surface covered—15

Typical profile

0 to 6 inches—very stony loam; 10 to 25 percent cobbles and stones and 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, SC, CL; estimated AASHTO classification—A-6

6 to 13 inches—clay loam; 0 to 10 percent cobbles and stones and 10 to 25 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, CL; estimated AASHTO classification—A-2, A-6, A-7

13 to 17 inches—gravely clay; 5 to 15 percent cobbles and stones and 20 to 45 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 3); estimated Unified classification—SC, CL, CH, GC; estimated AASHTO classification—A-2, A-7

17 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 10 to 20 inches
Depth to a seasonal high water table: More than 60 inches

Flooding: None
Permeability: Slow
Available water capacity: 2.1 to 2.5 inches
Water-supplying capacity: About 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.17; T value—1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

Characteristics of the Millerlux Soil

Position on landscape: Summits of plateaus
Parent material: Kind—residuum somewhat influenced by loess; source—basalt
Slope features: Length—long; shape—convex
Dominant present vegetation: Low sagebrush, black sagebrush, Idaho fescue
Rock fragments on the surface: Kind—gravel, stones, cobbles; percentage of surface covered—26

Typical profile

0 to 6 inches—very stony loam; 15 to 25 percent cobbles and stones and 20 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, GC; estimated AASHTO classification—A-4, A-6
6 to 13 inches—clay; 0 to 10 percent cobbles and stones and 0 to 15 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CH; estimated AASHTO classification—A-7
13 to 18 inches—gravelly clay; 0 to 15 percent cobbles and stones and 25 to 35 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CH, SC, CL; estimated AASHTO classification—A-7
18 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 12 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.3 to 2.7 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.20; T value—1; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight

Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: The rims and summits of plateaus
Distinctive present vegetation: Barren

Inclusion 2
Position on landscape: North-facing side slopes of plateaus
Distinctive present vegetation: Oceanspray, basin wildrye

Inclusion 3
Position on landscape: Concave areas around seeps and springs
Distinctive present vegetation: Sedge, rush

Major Uses

Current uses: Wildlife habitat, rangeland

Wildlife habitat elements

Suitability of the Madeline soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Suitability of the Millerlux soil for named elements: Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Ratings and restrictive features of the Madeline soil for selected uses and practices

Range seeding: Poor—droughty
Daily cover for landfill: Poor—depth to bedrock, too clayey, hard to pack
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, low strength, slope
Roadfill: Poor—depth to bedrock, low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Millerlux soil for selected uses and practices

Range seeding: Poor—droughty
Daily cover for landfill: Poor—depth to bedrock, hard to pack
Shallow excavations: Severe—depth to bedrock
Local roads and streets: Severe—depth to bedrock, low strength, shrink-swell
Roadfill: Poor—depth to bedrock, low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, too clayey
Pond reservoir areas: Severe—depth to bedrock, slope Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Madeline—VIle, nonirrigated; Millerlux—VIls, nonirrigated
Range site: Madeline—027X058N; Millerlux—024X016N

3050—Millerlux-Ninemile-Madeline association

Map Unit Setting

Position on landscape: Plateaus
Elevation: 5,500 to 7,600 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days

Composition

Major components:
- Millerlux very stony loam, 4 to 15 percent slopes—Lithic Xerollic Haplorgids, clayey, montmorrillonitic, frigid—40 percent
- Ninemile very stony loam, 4 to 15 percent slopes—Lithic Argixerolls, clayey, montmorrillonitic, frigid—35 percent
- Madeline very stony loam, 15 to 30 percent slopes—Lithic Argixerolls, clayey, montmorrillonitic, frigid—10 percent

Contrasting inclusions:
- Inclusion 1: Rock outcrop—6 percent
- Inclusion 2: Xeric Torriorthents gravelly loam, 4 to 15 percent slopes—Xeric Torriorthents, loamy-skeletal, mixed (calcareous), frigid—5 percent
- Inclusion 3: Pachic Argixerolls loam, 15 to 30 percent slopes—Pachic Argixerolls, fine-loamy, mixed, frigid—4 percent

Characteristics of the Millerlux Soil

Position on landscape: Summits of plateaus
Parent material: Kind—residuum; source—basalt
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Low sagebrush, black sagebrush, Idaho fescue
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—26

Typical profile

0 to 6 inches—very stony loam; 15 to 25 percent cobbles and stones and 20 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, SC; estimated AASHTO classification—A-4, A-6
6 to 13 inches—clay; 0 to 10 percent cobbles and stones and 0 to 15 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CH; estimated AASHTO classification—A-7
13 to 18 inches—gravelly clay; 0 to 15 percent cobbles and stones and 25 to 35 percent pebbles (by weight); angular blocky structure; hard, firm; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CH, SC, CL; estimated AASHTO classification—A-7
18 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 12 to 20 inches
Depth to a seasonal high water table: More than 60 inches
Flooding: None
Permeability: Very slow
Available water capacity: 2.3 to 2.7 inches
Water-supplying capacity: About 10 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—0.20; T value—1; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—high; to concrete—low
Potential for frost action: Low

Characteristics of the Ninemile Soil

Position on landscape: Summit of plateaus
Parent material: Kind—residuum; source—basalt
Slope features: Length—long; shape—slightly concave
Dominant present vegetation: Low sagebrush, pine bluegrass
Rock fragments on the surface: Kind—gravel, cobbles, stones; percentage of surface covered—15

Typical profile

0 to 7 inches—very stony loam; 40 to 70 percent cobbles and stones and 15 to 30 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—CL-ML; estimated
AASHTO classification—A-4
7 to 14 inches—gravelly clay; 0 to 15 percent cobbles
and stones and 25 to 35 percent pebbles (by
weight); angular blocky structure; hard, friable;
neutral (pH 7.2); nonsaline (less than 2 mmhos/cm);
nonsodic (SAR less than 13); estimated Unified
classification—CH; estimated AASHTO
classification—A-7
14 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 10 to 20 inches
Depth to a seasonal high water table: More than 60
inches
Flooding: None
Permeability: Very slow
Available water capacity: 1.3 to 1.6 inches
Water-supplying capacity: About 8 inches
Runoff: Medium
Hydrologic group: D
Erosion factors (surface layer): K value—.15; T value—
1; wind erodibility group—8
Hazard of erosion: By water—slight; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

Characteristics of the Madeline Soil

Position on landscape: Side slopes of plateaus
Parent material: Kind—residuum; source—basalt
Slope features: Length—long; shape—slightly convex
Dominant present vegetation: Mountain big sagebrush,
snowberry, Thurber needlegrass
Rock fragments on the surface: Kind—gravel, cobbles,
estones; percentage of surface covered—15

Typical profile
0 to 6 inches—very stony loam; 10 to 25 percent
cobbles and stones and 20 to 35 percent pebbles
(by weight); platy structure; slightly hard, very
friable; neutral (pH 7.0); nonsaline (less than 2
mmhos/cm); nonsodic (SAR less than 13);
estimated Unified classification—GC, SC, CL;
estimated AASHTO classification—A-6
6 to 13 inches—clay; 0 to 10 percent cobbles and
stones and 10 to 20 percent pebbles (by weight);
subangular blocky structure; hard, firm; neutral (pH
7.2); nonsaline (less than 2 mmhos/cm); nonsodic
(SAR less than 13); estimated Unified
classification—SC, CL; estimated AASHTO
classification—A-2, A-6, A-7
13 to 27 inches—gravelly clay; 5 to 15 percent cobbles
and stones and 25 to 45 percent pebbles (by
weight); angular blocky structure; hard, firm; neutral
(pH 7.2); nonsaline (less than 2 mmhos/cm);
nonsodic (SAR less than 3); estimated Unified
classification—SC, CL, CH, GC; estimated AASHTO
classification—A-2, A-7
17 inches—unweathered bedrock

Soil and water features

Depth to bedrock: 10 to 20 inches
Depth to a seasonal high water table: More than 60
inches
Flooding: None
Permeability: Slow
Available water capacity: 2.1 to 2.5 inches
Water-supplying capacity: About 7 to 9 inches
Runoff: Rapid
Hydrologic group: D
Erosion factors (surface layer): K value—.17; T value—
1; wind erodibility group—8
Hazard of erosion: By water—moderate; by wind—slight
Shrink-swell potential: High
Corrosivity: To steel—moderate; to concrete—low
Potential for frost action: Low

Contrasting Inclusions

Inclusion 1
Position on landscape: Shoulder slopes of plateaus
Distinctive present vegetation: Barren

Inclusion 2
Position on landscape: Shoulder slopes of plateaus
Distinctive present vegetation: Idaho fescue, low
sagebrush

Inclusion 3
Position on landscape: North-facing side slopes of
plateaus
Distinctive present vegetation: Oceanspray, basin
wildrye

Major Uses

Current uses: Wildlife habitat, rangeland

Wildlife habitat elements

Suitability of the Millerlux soil for named elements: Wild
herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Ninemile soil for named elements: Wild
herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair
Suitability of the Madeline soil for named elements: Wild
herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

Rating and restrictive features of the Millerlux soil
for selected uses and practices

Range seeding: Poor—droughty
Daily cover for landfill: Poor—depth to bedrock, hard to pack
Shallow excavations: Severe—depth to bedrock
Local roads and streets: Severe—depth to bedrock, low strength, shrink-swell
Roadfill: Poor—depth to bedrock, low strength, shrink-swell
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Ninemile soil for selected uses and practices

Range seeding: Poor—droughty large stones
Daily cover for landfill: Poor—depth to bedrock, too clayey, hard to pack
Shallow excavations: Severe—depth to bedrock
Local roads and streets: Severe—depth to bedrock, low strength
Roadfill: Poor—depth to bedrock, low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones

Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Ratings and restrictive features of the Madeline soil for selected uses and practices

Range seeding: Poor—droughty
Daily cover for landfill: Poor—depth to bedrock, too clayey, hard to pack
Shallow excavations: Severe—depth to bedrock, slope
Local roads and streets: Severe—depth to bedrock, low strength, slope
Roadfill: Poor—depth to bedrock, low strength
Sand: Improbable source—excess fines
Gravel: Improbable source—excess fines
Topsoil: Poor—depth to bedrock, small stones, slope
Pond reservoir areas: Severe—depth to bedrock, slope
Embankments, dikes, and levees: Severe—thin layer

Interpretive Groups

Capability classification: Millerlux—VII, nonirrigated; Ninemile—VII, nonirrigated; Madeline—Vile, nonirrigated
Range site: Millerlux—024X016N; Ninemile—027X046N; Madeline—027X058N
Prime Farmland

In this section, prime farmland is defined and the soils in the survey area that are considered prime farmland are listed.

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

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban or built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

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

Soils that receive an inadequate amount of rainfall qualify for prime farmland only in areas where this limitation has been overcome by irrigation. Onsite evaluation is needed to determine whether or not the limitation has been overcome by corrective measures.

The following map units meet the soil requirements for prime farmland where irrigated. The extent of each listed map unit is shown in Table 4. The location of each map unit is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

<table>
<thead>
<tr>
<th>Code</th>
<th>Soils Description</th>
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<tbody>
<tr>
<td>231</td>
<td>Dun Glen very fine sandy loam, 2 to 4 percent slopes</td>
</tr>
<tr>
<td>233</td>
<td>Dun Glen very fine sandy loam, 0 to 2 percent slopes</td>
</tr>
<tr>
<td>234</td>
<td>Dun Glen silt loam, frequently flooded, 0 to 2 percent slopes</td>
</tr>
<tr>
<td>360</td>
<td>Needle Peak silt loam, slightly saline-sodic</td>
</tr>
<tr>
<td>400</td>
<td>Orovada loam, 0 to 2 percent slopes</td>
</tr>
<tr>
<td>470</td>
<td>Raglan silt loam</td>
</tr>
<tr>
<td>480</td>
<td>Rebel loam, 0 to 2 percent slopes</td>
</tr>
<tr>
<td>481</td>
<td>Rebel loam, 2 to 4 percent slopes</td>
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<tr>
<td>482</td>
<td>Rebel loam, rarely flooded, 0 to 2 percent slopes</td>
</tr>
<tr>
<td>600</td>
<td>Valmy fine sandy loam, 0 to 2 percent slopes</td>
</tr>
<tr>
<td>610</td>
<td>Weso very fine sandy loam, 0 to 2 percent slopes</td>
</tr>
<tr>
<td>980</td>
<td>Mazuma very fine sandy loam, 0 to 4 percent slopes</td>
</tr>
<tr>
<td>1020</td>
<td>Wholan very fine sandy loam, rarely flooded, 0 to 2 percent slopes</td>
</tr>
<tr>
<td>1111</td>
<td>Yipor silt loam, sandy substratum</td>
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</tbody>
</table>
Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

A.R. Melis, district conservationist, and Edward W. Biggs, soil conservationist, helped prepare this section.

In this section, general management needed for crops and pasture is suggested and the system of land capability classification used by the Soil Conservation Service is explained.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Detailed Soil Map Units.” Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Resource management systems are a combination of interrelated conservation practices and management techniques used in arresting or preventing deterioration of cropland or pasture and in maintaining the productive capability of the soil. These systems keep erosion within acceptable limits and help to solve other problems that may restrict production.

Different management is needed on diverse kinds of soil. Basic management practices, however, apply to all cultivated soils. These practices are described in the following paragraphs.

Conservation cropping systems.—A conservation cropping system consists of a crop rotation and the soil-improving cultural and management practices that more than offset the effects of soil-depleting crops and of practices that result in deterioration of tilth. The system should control erosion and maintain or improve fertility and the physical condition of the soil. It should include perennial legumes, grass-legume mixtures, or other crops that produce large quantities of residue to compensate for the crops in the rotation that produce little or no residue.

Applying the proper kinds and amounts of fertilizer helps to maintain or improve fertility. Limiting tillage operations to those that are essential for seedbed preparation and weed control and timing them to coincide with the proper soil moisture condition help to prevent compaction and maintain tilth.

A typical cropping system used in this survey area consists of 8 to 10 years of alfalfa and 2 years of small grain. Residue from small grain is usually returned to the soil. Seeding alfalfa into the grain stubble helps to prevent excessive erosion and frost damage. The stubble reduces the evaporation rate and minimizes surface crusting.

Irrigation water management.—Proper irrigation water
management is the application of irrigation water at
rates and in amounts adequate to produce high crop
yields and to minimize soil and water losses. Applying
the water according to the needs of the crop and the
characteristics of the soil results in an efficient irrigation
system. Properly locating and controlling the system
can ensure that seepage losses are minimal. Control
structures are needed to facilitate water management.
The design of an irrigation system is governed by the
method of irrigation to be used and the expected
efficiency in applying water.

Efficient water application involves consideration of
the available water capacity of the soil, the rate at
which water penetrates the surface and moves through
the soil, and the amount of water required by the crop.
Most crops should be irrigated when 40 to 50 percent of
the available moisture in the top half of the root zone
has been used. Adjusting the application of irrigation
water to the available water capacity, the water intake
rate, and the needs of the crop generally helps to
prevent overirrigating, the leaching of plant nutrients,
and a rise in the level of a high water table.

Management of saline soils.—Like most soils in arid
and subarid regions, the soils in this survey area
contain at least small quantities of soluble salts and
alkali. Because the amount of rainfall is low and the
rate of evaporation is high, salts are not leached out of
the root zone. In some soils high concentrations of salts
and sodium limit or prevent the growth of crops. In
addition, many low-lying areas receive salty water from
runoff or seepage. Surface evaporation of this water
generally results in an increase in the content of soluble
salts on or in the soils. In some areas that have a high
water table, water carrying dissolved salts rises in the
soils through capillary action. The soluble salts, which
are readily dissolved in water, can be moved to any part
of the soil profile.

A saline soil contains excessive amounts of soluble
salts. A sodic soil contains excessive amounts of
exchangeable sodium. A saline-sodic soil contains
excessive amounts of both soluble salts and sodium.

Saline-sodic phases of several of the soil series in
the survey area have been mapped. The map unit
name generally does not indicate the degree to which
these soils are affected, nor does it indicate that they
contain both salts and sodium. This information is given
in the map unit descriptions.

Four classes of salinity are recognized in the detailed
map unit descriptions. These classes are nonsaline,
slightly saline, moderately saline, and strongly saline.

A nonsaline soil contains less than 0.15 percent
soluble salts. The electrical conductivity of the
saturation extract is less than 4 millimhos per
centimeter at 25 degrees C.

A slightly saline soil contains 0.15 to 0.35 percent
soluble salts. The electrical conductivity of the
saturation extract is 4 to 8 millimhos per centimeter at
25 degrees C.

A moderately saline soil contains 0.35 to 0.65 percent
soluble salts. The electrical conductivity of the
saturation extract is 8 to 16 millimhos per centimeter at
25 degrees C.

A strongly saline soil contains more than 0.65 percent
soluble salts. The electrical conductivity of the
saturation extract is more than 16 millimhos per
centimeter at 25 degrees C.

Four classes of sodicity are recognized in the
detailed map unit descriptions. These classes are
nonsodic, slightly sodic, moderately sodic, and strongly
sodic. A nonsodic soil contains less than 15 percent
exchangeable sodium; a slightly sodic soil, 15 to 25
percent; a moderately sodic soil, 25 to 40 percent; and a
strongly sodic soil, more than 40 percent.

Soils differ in the kinds of salts they contain and in
the practices needed for improvement. For this reason,
each soil requires individual treatment. Some general
guidelines, however, can be given.

A good supply of water and an adequate drainage
system are needed to reclaim any salt- or sodium-
affected soil. Two methods of applying water are
commonly used. One method is land leveling that
results in flat basins in which the water can accumulate.
The other method involves leveling the land to a
uniform grade and then flooding between border dikes.
If drainage is adequate and if large amounts of water
are applied, either method can leach the soluble salts
out of the root zone. This leaching process is more
difficult where a soil contains an excessive amount of
exchangeable sodium. In addition to drainage and
leaching, other practices are needed to improve
sodium-affected soils.

Chemical amendments used to replace sodium are
gypsum and its various forms, including gypsite,
anhydrite, and selenite, as well as elemental sulfur,
sulfuric acid, iron sulfate, and aluminum sulfate. Any of
these amendments can be successfully used, although
some react faster than others. Cost, availability, and
the content of calcium carbonates in the soil generally
determine the choice. The amount of an amendment
needed can be determined by laboratory analysis of soil
samples, which indicates the amount of sodium that
must be replaced if the soil is to be improved.

An alternative to reclamation through the use of large
quantities of gypsum is the seeding of salt- and sodium-
tolerant grasses. The well suited grasses include tall
wheatgrass, western wheatgrass, and alta fescue.
These grasses can grow in soils that have relatively
strong concentrations of both soluble salts and sodium.
Applications of plant nutrients.—Most crops in the survey area respond well to applications of solid or liquid fertilizer. Specific fertilizer requirements are based on soil sampling or analysis of plant tissue. Applications of phosphorus and nitrogen increase the production of small grain and aid in establishing alfalfa. Unless seeded in combination with grasses, established alfalfa generally requires only applications of phosphorus throughout the duration of the stand.

Erosion control.—Protection of the surface layer from wind erosion and water erosion is important because this layer contains most of the organic matter in the soil and is generally more fertile than the subsoil. Wind erosion can be controlled by leaving a protective plant cover on the surface and minimizing tillage during windy periods. Water erosion generally can be controlled by leveling to a proper irrigation grade and by applying irrigation water at the proper rate.

Pasture management.—Proper pasture management includes a grazing system that maintains a prolonged stand of high-quality grasses and legumes, protects the soil from erosion, and limits water losses. Two biological systems, plants and animals, are included in the management program. Their needs can be best met by rotating grazing among several pastures. A rotation grazing system allows irrigation, drying, and regrowth in each pasture during the grazing cycle. Grazing when the pastures are too wet results in compaction and deterioration of soil structure and decreases the rate of water intake.

Forage yields generally can be increased by applications of commercial fertilizer or barnyard manure. Mowing or applying selected herbicides can control weeds. Manure droppings can be spread with a drag in spring.

The frequency of irrigation varies, depending on soil texture, the number of daylight hours, temperature, and plant growth and vigor. Irrigation is needed before the soil moisture is depleted below 50 percent of the available water capacity.

Hayland management.—Proper hayland management prolongs the life of desirable forage plants, maintains or improves the quality of forage, protects the soil from erosion, and limits water losses. Alfalfa hay is grown on most of the hayland in the survey area. High-quality, certified, inoculated seeds of climatically adapted species produce the highest yields during the relatively short growing season. The amount of irrigation water and the frequency of application depend on the available water capacity of the soil and the rate of evapotranspiration.

Land leveling, grading, shaping, and subsossiling should be completed before final seedbed preparation. An annual crop should be grown for a year or two before alfalfa is established or reestablished. Yields generally can be increased by applications of fertilizer. For the highest quality forage, alfalfa should be harvested at about one-tenth bloom or when new crown buds are 0.5 to 1.0 inch long.

Aftermath grazing can be used in fall or winter. Leaving a stubble height of 3 to 4 inches helps to control erosion. Plants should not be grazed in late winter or in early spring, when they have started new growth. Grazing at this time depletes food reserves in the roots. This depletion can damage the stand and reduce forage production.

Drainage.—Soils on flood plains along perennial and intermittent streams generally have a seasonal high water table from December through July. The water table rises in fall, when the rate of evapotranspiration decreases, and is at a maximum height during peak runoff periods in spring. Soils that are flooded naturally or by seasonal irrigation may require a surface drainage system. Field ditch mains or laterals are needed to dispose of excess surface or subsurface water, to intercept ground water, to control the level of the ground water, and to aid in leaching saline or alkali soils.

Yields per Acre

Information about the average yields per acre that can be expected of the principal crops grown in the survey area under a high level of management can be obtained at the local office of the Soil Conservation Service. In any given year, yields may be higher or lower because of variations in rainfall and other climatic factors.

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The
numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

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

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, e, w, s, or c, to the class numeral, for example, Ile. 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, stony, or stony; and c, used only in some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

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

The capability classification of each map unit is given in the section “Detailed Soil Map Units.”

Rangeland

About 96 percent of this survey area is rangeland. Almost all of the agricultural income in the area is derived from the sale of livestock, mainly cattle. Cattle-calf enterprises are dominant, but cow-calf-yearling enterprises are in some areas. The ranches in the survey area range from about 230,000 acres to 5,000 acres in size. Most of the grazing in the survey area is on land administered by the Bureau of Land Management.

On some ranches the forage produced on rangeland is supplemented by aftermath grazing on hayland and in fields of small grain stubble in fall. In winter the native forage is supplemented by hay. Creep feeding is used to increase the market weight of calves and yearlings on some ranches.

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

The tables in the section “Rangeland Plants and Woodland Understory” show the rangeland plants and woodland understory for each major soil and contrasting inclusion in the detailed soil map units; the common plant name and plant symbol for the grasses, forbs, and shrubs that make up the potential native plant community on the unit; the percentage composition of each species; and the total annual production of vegetation in favorable, normal, and unfavorable years. There are tables only for those soils that are used for or suited to rangeland.

The percentage composition is the expected percentage of the total annual production. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

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

Dry weight is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by
comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only. It does not have a specific meaning that pertains to the present plant community in a given use.

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

Grazing management should be at an intensity that maintains enough cover to protect the soil and maintains or improves the quality and quantity of desirable vegetation. This management applies to all grazing animals, including livestock, game animals, and wild horses.

A planned grazing system is the most practical and efficient way to achieve good management of livestock grazing. Where this system is applied, the same grazing unit is not grazed at the same time year after year. Two or more grazing units are alternately rested in a planned sequence over a period of years. The rest period should extend at least through the growing season of the key plants.

The planned grazing system should be designed so that it not only meets the needs of the individual grazing unit but also helps to achieve management objectives. A uniform distribution of grazing can be achieved by providing livestock watering facilities and salt, fencing, and constructing livestock trails.

In some areas measures that accelerate range improvement can be used. Good grazing management should be applied in conjunction with these measures.

Brush control is needed when the amount of the less desirable woody species is in excess of what is natural for the site. If effectively planned and applied, this practice can be beneficial to both livestock and wildlife and can minimize sedimentation and improve the quality of the watershed.

Chemical treatment and prescribed burning are effective in controlling brush. When chemicals are applied according to the manufacturer’s recommendations and at the proper time, good results can be expected. There must be an adequate amount of desirable plant species in the understory to respond to the treatment. Prescribed burning is relatively inexpensive but requires precautions. It can be successful if a good understory is available to provide fuel and if the burning is properly timed. Prescribed burning is less selective than chemical treatment.

Mechanical treatment practices, such as plowing, chaining, and beating, are effective in controlling brush on certain sites, but the cost of these practices is high.

Range seeding is needed when the range has so deteriorated that the desired plant species have disappeared. It also is needed as critical area treatment following a wildfire. Evaluating the sites to be seeded on the basis of the soil, climate, topography, and planned use helps to determine the suitable species and the seeding techniques that can be used. Rainfall strongly influences the success of seeding in this survey area. Precipitation fluctuates significantly from year to year even in the areas of higher rainfall. The success of range seeding depends on the amount of moisture available during the growing season.

In the detailed soil map units, soils are rated for planned range seeding. The criteria used to develop these ratings are listed in the “Appendix.” If critical area treatment is needed, a good plant cover can help to prevent accelerated erosion on bare soils that are poorly suited to seeding.

Woodland Management

Woodland in this survey area is limited to small areas of singleleaf pinyon and Utah juniper and a few small stands of quaking aspen. These sites are mainly on the south- and west-facing crests and side slopes of mountains. They are on the East, Humboldt, Sonoma, Stillwater, and Tobin Ranges and on Augusta Mountain.

The woodland has low potential for wood products. It is used mainly for wildlife habitat and for understory grazing by livestock. The pinyon and juniper are used for fenceposts and firewood on a limited basis. Steep slopes limit access to most of the stands.

The descriptions of the detailed soil map units can be used by woodland owners or forest managers in planning the use of soils for wood crops. In the descriptions, the soils that are suitable for wood crops are identified and the woodland suitability group for each of these soils is identified. The group is indicated by an ordination symbol. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the ordination symbol, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter
indicates steep slopes; X, stoniness or rockiness; W, excess water in or on the soil; T, toxic substances in the soil; D, a restricted rooting depth; C, clay in the upper part of the soil; S, sandy texture; and F, a high content of coarse fragments. The letter O indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

The potential productivity of common trees on a soil is expressed as a site index. This index is the basal area that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

**Woodland Understory Vegetation**

Understory vegetation consists of grasses, forbs, shrubs, and other plants. If well managed, some woodland can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

The quantity and quality of understory vegetation varies with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter. The density of the canopy determines the amount of light that understory plants receive.

The potential production of understory vegetation is given for each soil suitable for woodland in the tables under the heading “Rangeland Plants and Woodland Understory.” An X in the tables indicates that the named plant occurs in the understory when the canopy density is most nearly typical of woodland in areas where the production of wood crops is highest.

The total production of understory vegetation includes the herbaceous plants and the leaves, twigs, and fruit of woody plants up to a height of 4.5 feet. It is expressed in pounds per acre of air-dry vegetation in favorable, normal, and unfavorable years. In a favorable year, soil moisture is above average during the optimum part of the growing season; in a normal year, soil moisture is average; and in an unfavorable year, it is below average.

**Windbreaks and Environmental Plantings**

A.R. Melis, district conservationist, and Edward W. Biggs, soil conservationist, helped prepare this section.

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

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

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

Few windbreaks are planted in this survey area, although they are desirable because they can protect livestock and buildings. The windbreaks in the area should be irrigated.

The species that are suited to the soils on the proposed site for the windbreak should be selected for planting. The species that can be grown on deep, well drained soils include Fremont cottonwood (male), Siberian elm, Scotch pine, cotoneaster, and caragana. Poplar, cottonwood, Russian-olive, golden willow, buffaloberry, redosier dogwood, and honeysuckle can be grown on wet soils. The species that can be grown on saline-sodic soils include Siberian elm, mulberry, Russian-olive, buffaloberry, fourwing saltbush, and big saltbush. The species that can be grown on shallow soils include honeylocust, Rocky Mountain juniper, chokecherry, cotoneaster, currant, caragana, and pyracantha.

Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local offices of the Soil Conservation Service or the Cooperative Extension Service or from a nursery.

**Wildlife Habitat**

Wildlife is a valuable resource in the survey area. It provides opportunities for such outdoor activities as hunting and fishing.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

Good management is needed to provide food and cover for wildlife. Most managed wildlife habitat is created, improved, or maintained by planting suitable
vegetation, by manipulating the existing vegetation to bring about the natural establishment of desired plants, or by a combination of these. The combination of habitat elements needed by specific species of wildlife generally requires several kinds of soil and a combination of land uses. As a result, the best interpretations for wildlife habitat are those that relate to the map units described in the section "General Soil Map Units." In the following paragraphs, the general soil map units in the survey area are divided into wildlife areas that differ from one another in potential wildlife species and environmental factors.

Wildlife area 1 is in general soil map units 2, 3, and 5. The soils in this area are nearly level to moderately sloping and are on bolson and semibolson floors. The native vegetation is big saltbush, black greasewood, shadscale, and Bailey greasewood.

The wildlife species in this area include jackrabbit, coyote, bobcat, and some quail. The availability of water is the main concern in managing the habitat. The rangeland in the area should be managed so that the content of alkali and alkali in the soils is not increased. The alkali and alkali result in a less desirable plant community.

Wildlife area 2 is in general soil map unit 4. The soils in this area are nearly level and are on the broad flood plains, stream terraces, and lake plain terraces along the Humboldt River. The vegetation is mainly basin wildrye, willows, alkali sacaton, inland saltgrass, and black greasewood in strongly salt- and alkali-affected areas.

The wildlife species in this area include ducks, geese, beaver, muskrat, cottontail, jackrabbit, mule deer, coyote, bobcat, pheasant, and quail. Management of the area should include measures that reduce the content salts in the soils. Long-term management is limited by periods of flooding caused by the uncontrolled flow of the Humboldt River. The river supports such species as catfish and carp.

Wildlife area 3 is in general soil map units 6, 7, and 8. The soils in this area are on fan piedmonts, fan skirts, and inset fans. The native vegetation varies. It includes black greasewood, bud sagebrush, shadscale, Wyoming big sagebrush, grasses, and some black sagebrush. Because of a shortage of water, the area has relatively few kinds of wildlife species and a low population of wildlife. Some of the area is used as cropland.

The wildlife species in this area include jackrabbit, coyote, and bobcat. Quail is in or near the areas of cropland. A few mule deer and Hungarian partridge use this area in winter. In cultivated areas fence rows and ditches that support desirable plants provide good habitat for quail and other kinds of openland wildlife.

The availability of water is the main concern in managing the habitat.

Wildlife area 4 is in general soil map units 9, 10, 11, 13, 14, and 16. The soils in this area are on moderately sloping to very steep foothills and at low and mid elevations on mountains. The native vegetation is mainly big sagebrush, low sagebrush, and grasses. Black sagebrush is in areas of limestone, and shadscale and bud sagebrush are in some areas on foothills.

The wildlife species in this area include jackrabbit, cottontail, deer, coyote, bobcat, chukar, Hungarian partridge, and sage grouse. Drainageways, seeps, and springs provide some water in the area. Properly located watering facilities can improve the habitat.

Wildlife area 5 is in general soil map units 12 and 15. The soils in this area are on moderately sloping to very steep, high mountains. The native vegetation is mainly mountain big sagebrush, low sagebrush, and an understory of bluebunch wheatgrass and Idaho fescue.

Included in this area are small wet meadows, which significantly enhance the overall potential of the area for wildlife habitat. The meadows should be protected from gullying.

The wildlife species in this area include mule deer, sage grouse, chukar, jackrabbit, cottontail, coyote, and bobcat.

Wildlife area 6 is in general soil map unit 14. The soils in this area are on steep and very steep side slopes on intermediate mountains. The native vegetation is mainly singleleaf pinyon and Utah juniper. Areas of limestone have an understory of mountain big sagebrush and black sagebrush.

The wildlife species in this area include mule deer, chukar, cottontail, coyote, and bobcat. Drainageways, seeps, and springs provide some water in the area.

Recreation

This survey area can be developed for recreational uses in many areas, including mountainous areas, valley bottoms, and other areas. The chief recreational activities in the area are hunting, fishing, picnicking, riding, and hiking.

Restrictive soil features, such as wetness, slope, texture of the surface layer, and susceptibility to flooding, should be considered in the selection of sites for recreational development. Other important considerations 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 are also
important. Soils 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.

Camp areas, picnic areas, playgrounds, and paths and trails require special attention.

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 best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not flooded more than once a year during the period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Engineering

The section "Detailed Soil Map Units" provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified (21). The ratings are given for roadfill; daily cover for landfill; shallow excavations; local roads and streets; pond reservoir areas; embankments, dikes, and levees; sand; topsoil; gravel; terraces and diversions; drainage; and irrigation. The ratings are based on observed performance of the soils and on estimated data given in the map unit descriptions. Information on other uses can be obtained from local offices of the Soil Conservation Service.

The information is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

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

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information. 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. The criteria used to determine the ratings are provided in the "Appendix." During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

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

The information in the map unit descriptions, along with the soil maps, series 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."
Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features are given in the section "Detailed Soil Map Units."

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

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

The estimates of soil properties given in the map unit descriptions include the range of grain-size distribution, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area are given in the detailed map unit descriptions and in table 5. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

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

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

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silt 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, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 3 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. The estimates are rounded to the nearest 5 percent.

Percentage of soil particles passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on
laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

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

Physical and Chemical Properties

Estimates of some characteristics and features that affect soil behavior are given in the detailed map unit descriptions. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading “Soil Series and Their Morphology.”

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

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

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

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 map unit descriptions. Salinity affects the suitability of a soil for rangeland seeding and crop production, the stability of the soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodicity is a measure of exchangeable sodium in the soil at saturation. It is expressed as a sodium adsorption ratio (SAR), or the ratio of sodium to calcium plus magnesium. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The sodicity of irrigated soils is affected by the quality of irrigation water and management of the soil. Hence, the sodicity of soils in individual fields can differ greatly from the value given in the map unit descriptions. Sodicity affects the suitability of a soil for range seeding and crop production and the stability of the soil if used as construction material.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are low, a change of less than 3 percent; moderate, 3 to 6 percent; and high, more than 6 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six
factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, very fine sand, sand, and organic matter (up to 4 percent) and on soil structure and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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

_Wind erodibility groups_ are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils containing rock fragments can occur in any group. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

The _hazard of erosion_ is an estimate of the likelihood of erosion by water and wind when the soil is bare. The hazard of water erosion is determined on the basis of erosion factor K and the slope. The hazard of wind erosion is determined on the basis of the stability of the soil surface and the climate. The guidelines used in estimating the hazard of erosion are given in the "Appendix."

### Soil and Water Features

Estimates of various soil and water features are given in the detailed map unit descriptions. The estimates are used in land use planning that involves engineering considerations.

_Hydrologic soil groups_ are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils 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 clays 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 permanent 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.

_Flooding_, the temporary inundation of an area, is caused by overflowing streams or by runoff from
adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

The frequency and duration of flooding and the time of year when flooding is most likely are given in the map unit descriptions.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. None means that flooding is not probable; rare that it is unlikely but possible under unusual weather conditions; occasional that it occurs, on the average, no more than once in 2 years; and frequent that it occurs, on the average, more than once in 2 years. Duration is expressed as very brief if less than 2 days, brief if 2 to 7 days, and long if more than 7 days. Probable dates are expressed in months.

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.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. The depth to the seasonal high water table is indicated in the map unit descriptions. A water table that is seasonally high for less than 1 month is not indicated. Only saturated zones within a depth of about 6 feet are indicated.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping.

A hardpan is a cemented or indurated subsurface layer within a depth of 5 feet. Such a pan causes difficulty in excavation. Pans are classified as thin or thick. A thin pan is less than 3 inches thick if continuously indurated or less than 18 inches thick if discontinuous or fractured. Excavations can be made by trenching machines, backhoes, or small rippers. A thick pan is more than 3 inches thick if continuously indurated or more than 18 inches thick if discontinuous or fractured. Such a pan is so thick or massive that blasting or special equipment is needed in excavation.

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

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

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

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

The system of soil classification used by the National Cooperative Soil Survey has six categories (20). 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 6 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

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

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Orthid (Orth, meaning true, plus id, from Aridisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; 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 Camborthids. (Camb, meaning change, plus orthid, a suborder of the Aridisols).

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

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistency, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is loamy-skeletal, mixed, mesic Typic Camborthids.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistency, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The typical pedon of some of the soils in the survey area is located in the eastern part of Humboldt County because a large part of Pershing County was mapped in an older survey of the Sonoma area, which included parts of Humboldt and Pershing Counties (22). For these soils, the description of the typical pedon already available has been used regardless of the survey area in which the pedon occurred.

The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (19). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (20). Unless otherwise stated, matrix colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.
The map units of each soil series are described in the section "Detailed Soil Map Units."

**Adelaide Series**

The Adelaide series consists of shallow, well drained, very slowly permeable soils that formed in a mantle of loess high in content of volcanic glass over mixed alluvium. Adelaide soils are on fan piedmont remnants. Slopes are 0 to 15 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Entic Durothids

**Typical pedon:** Adelaide silt loam, 0 to 2 percent slopes:

A—0 to 2 inches; brownish gray (10YR 6/2), slightly micaceous silt loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and few fine vesicular pores; neutral (pH 6.8); abrupt smooth boundary. (1 to 5 inches thick)

Bw—2 to 8 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and few fine tubular pores; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 7 inches thick)

Bq—8 to 11 inches; light gray (10YR 7/2) loam, dark grayish brown (10YR 4/2) moist; weak thick platy structure; very hard, firm, nonsticky and slightly plastic; few very fine and fine roots in the matrix, but common in fractures; many very fine and fine tubular pores; common thin pale brown (10YR 6/3) silica films in bands and pores and occurring as bridges between sand grains; 10 percent pebbles; weak silica cementation; strongly alkaline (pH 8.6); clear wavy boundary. (2 to 4 inches thick)

Bqkm—11 to 14 inches; light gray (10YR 7/2) and pale brown (10YR 6/3), strongly silica-cemented duripan, grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) moist; moderate fine angular and subangular blocky structure; extremely hard, firm and very firm; common very fine and few fine exped roots; common very fine interstitial pores; many thin silica films on faces of ped and lining pores and occurring as laminae; many medium and fine prominent white (10YR 8/2) lime veins and coatings; slightly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (2 to 5 inches thick)

Btkb—14 to 23 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate fine angular blocky structure; hard, friable, sticky and plastic; few very fine roots; few very fine tubular and many very fine interstitial pores; many thin clay films on faces of ped and lining pores; many fine distinct white (10YR 8/2) lime coatings and filaments; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary. (5 to 10 inches thick)

Bqkb—23 to 30 inches; very pale brown (10YR 7/3) gravelly loam, brown (10YR 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular and common very fine interstitial pores; 20 percent pebbles; 20 percent very hard and firm durinodes; common fine distinct white (10YR 8/2) lime veins; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (5 to 10 inches thick)

2Bqkm—30 to 40 inches; light gray (10YR 7/2) extremely gravelly loamy sand that is indurated in the upper one-eighth to one-quarter inch and weakly cemented below, brown (10YR 5/3) moist; massive; extremely hard, extremely firm in the upper part, and slightly hard, friable in the lower part; common very fine interstitial pores; 80 percent pebbles; many very fine white (10YR 8/2) lime coatings on indurated material and on discontinuous silica laminae in the lower part and very fine white lime coatings completely covering pebbles in the upper part and covering the underside of pebbles in the lower part; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (7 to 14 inches thick)

2Ck—40 to 60 inches; very pale brown (10YR 7/3) extremely gravelly loamy sand, brown (10YR 5/3) moist; single grain; loose; many fine interstitial pores; 80 percent pebbles; white (10YR 8/2) lime coatings on the underside of some pebbles; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Pershing County, Nevada; approximately 11 miles south of Winnemucca, 0.2 mile north of a county road and 0.6 mile west of the Sonoma Ranch house, about 700 feet north and 300 feet west of the southeast corner of sec. 9, T. 34 N., R. 38 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and spring

**Soil temperature:** 49 to 53 degrees F

**Depth to a duripan:** 10 to 15 inches

**Depth to the buried indurated pan:** 26 to 40 inches

**Control section:** Content of clay—6 to 18 percent; texture—loam, silt loam, or very fine sandy loam; content of rock fragments—as much as 5 percent
Other features: Content of silt and very fine sand ranging from 65 to 80 percent

A horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Structure—weak or moderate, thin to thick platy; massive in some pedons
Reaction—neutral or mildly alkaline

Bw horizon:
Structure—weak fine or medium subangular blocky or thin to thick platy; massive in some pedons
Other features—considered a cambic horizon where its base is below a depth of 10 inches

Bqkm horizon:
Structure—platy; massive in some pedons
Consistence—extremely hard or very hard
Other features—lime coatings on 10 to 30 percent of faces of peds and on silica laminae; a slightly effervescent to strongly effervescent matrix

Btkb horizon:
Content of clay—27 to 40 percent
Content of rock fragments—as much as 5 percent
Structure—moderate or strong, fine or medium angular blocky
Reaction—moderately alkaline or strongly alkaline
Other features—strongly effervescent or violently effervescent; white lime coatings on silica laminae, faces of peds, or pebbles in as much as 50 percent of the various horizons of the buried soil

2Bqkm horizon:
Structure—moderate or strong, thin or medium platy; massive in some pedons
Thickness—\( \frac{1}{8} \) inch to 6 inches of laminated strata separated by less strongly cemented material

Alley Series

The Alley series consists of very deep, well drained, moderately slowly permeable soils that formed in colluvium derived from basalt and andesite and somewhat influenced by loess. Alley soils are on low mountains and foothills. Slopes are 30 to 50 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 49 degrees F.

Taxonomic class: Fine-loamy, mixed, mesic Durixerollic Hapludolls

Typical pedon: Alley very cobbly very fine sandy loam, 30 to 50 percent slopes, in an area of Alley-Snowmore-Rock outcrop association where pebbles cover approximately 25 percent, cobbles 15 percent, and stones 15 percent of the surface:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very cobbly very fine sandy loam, dark brown (10YR 3/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine and few coarse vesicular pores; 25 percent cobbles, 10 percent pebbles; strongly effervescent; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 5 inches thick)

A2—2 to 5 inches; light brownish gray (10YR 6/2) very cobbly fine sandy loam, dark brown (10YR 3/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many fine tubular pores; 25 percent cobbles, 10 percent pebbles; strongly effervescent; mildly alkaline (pH 7.8); clear smooth boundary. (0 to 3 inches thick)

Bt1—5 to 18 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 5 percent cobbles, 15 percent pebbles; few thin clay films on faces of peds and lining pores; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 13 inches thick)

Bt2—18 to 22 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few very fine roots; many very fine and fine tubular pores; 15 percent pebbles, 5 percent cobbles; few thin clay films on faces of peds and lining pores; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 9 inches thick)

Bqk—22 to 30 inches; very pale brown (10YR 7/3) cobbly fine sandy loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; few very fine roots; many very fine tubular pores; 20 percent cobbles, 10 percent pebbles; weak silica and lime cementation; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (6 to 10 inches thick)

2Bk—30 to 60 inches; very pale brown (10YR 7/3) very cobbly fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 25 percent cobbles, 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4).

Type location: Pershing County, Nevada; approximately 37 miles south of Winnemucca, on the east slope of the East Range, about 350 feet
north and 800 feet west of the southeast corner of sec. 29, T. 30 N., R. 38 E.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist in winter and spring  
*Soil temperature:* 47 to 52 degrees F  
*Depth to strata of weak silica and lime cementation:* 16 to 30 inches  
*Depth to carbonates:* 16 to 22 inches  
*Other features:* Few to many fine to coarse lime segregations in most pedons where depth to the Bqk horizon is more than 22 inches

**A horizon:**  
Value—5 or 6 dry, 3 or 4 moist; more than 5.5 dry and 3.5 moist when the uppermost 7 inches is mixed  
Chroma—2 or 3  
Structure—weak or moderate, very thin to thick, platy or granular  
Reaction—neutral or mildly alkaline

**B horizon:**  
Value—5 or 6 dry, 4 or 5 moist  
Chroma—2 to 4  
Texture—gravelly loam, gravelly clay loam, or gravelly sandy clay loam  
Content of clay—20 to 30 percent  
Content of rock fragments—15 to 30 percent, mainly pebbles  
Structure—weak or moderate, fine to coarse subangular blocky  
Reaction—mildly alkaline or moderate alkaline

**Bqk horizon:**  
Value—6 to 8 dry, 4 to 6 moist  
Chroma—1 to 4  
Texture—gravelly fine sandy loam, gravelly sandy loam, or cobbly fine sandy loam  
Content of rock fragments—15 to 35 percent, mainly pebbles or cobbles  
Consistence—hard or very hard  
Reaction—moderately alkaline or strongly alkaline  
Silica cementation—few thin or very thin, discontinuous silica laminae in some pedons; some pedons commonly having durinodes in a friable matrix below the horizons with weak cementation

**2Bk horizon (not in all pedons):**  
Content of rock fragments—40 to 60 percent, when mixed, mostly pebbles and cobbles; a few stones in some pedons

**Alyan Series**

The Alyan series consists of moderately deep, well drained, slowly permeable soils that formed in residuum and colluvium derived from basalt and siliceous tuff. Alyan soils are on side slopes of plateaus and mountains. Slopes are 15 to 30 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Alyan extremely stony loam, 15 to 30 percent slopes, in an area of Alyan-Chen-Rock outcrop association where stones cover approximately 15 percent and pebbles and cobbles 10 percent each of the surface:

A1—0 to 5 inches; grayish brown (10YR 5/2) extremely stony loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common fine vesicular and many fine tubular pores; 20 percent stones, 2 percent cobbles, 2 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (1 to 5 inches thick)

A2—5 to 11 inches; grayish brown (10YR 5/2) very stony loam, dark brown (10YR 3/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; many fine tubular pores; 20 percent stones, 10 percent cobbles, 10 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (3 to 9 inches thick)

Bt1—11 to 15 inches; brown (7.5YR 5/2) gravelly clay loam, dark brown (7.5YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; few fine tubular pores; 5 percent cobbles, 10 percent pebbles; many thin clay films on faces of ped; mildly alkaline (pH 7.8); clear smooth boundary. (3 to 8 inches thick)

Bt2—15 to 33 inches; light brown (7.5YR 6/4) gravelly clay, brown (7.5YR 4/4) moist; strong medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; few fine tubular pores; 10 percent pebbles, 5 percent cobbles; continuous, thin clay films on faces of ped; mildly alkaline (pH 7.8); abrupt smooth boundary. (4 to 18 inches thick)

2R—33 inches; fractured basalt.

**Type location:** Pershing County, Nevada;  
approximately 8 miles south of Table Mountain, in the East Range, about 2,000 feet west and 700 feet south of the northeast corner of sec. 23, T. 29 N., R. 37 E.

**Range in Characteristics**

*Soil moisture:* Usually dry during the growing season;
moist in winter and spring, dry from mid-June through mid-October

Soil temperature: 44 to 47 degrees F

Mollic epipedon: 8 to 18 inches thick; includes the upper part of the argillic horizon

Depth to bedrock: 20 to 40 inches

Combined thickness of the A and Bt horizons: 20 to 40 inches

Control section: Content of clay—40 to 55 percent; content of rock fragments—average of 15 to 35 percent, mainly pebbles

A horizon:
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Structure—platy or subangular blocky
Reaction—neutral or mildly alkaline

B horizon:
Hue—10YR or 7.5YR
Value—5, 6, or 7 dry, 3, 4, or 5 moist; darker values commonly in the upper part of the horizon
Chroma—2, 3, or 4
Texture—clay or gravelly clay and thin subhorizons of very gravelly clay overlying the bedrock in most pedons; thin subhorizons of gravelly clay loam in some pedons
Structure—subangular blocky; massive in some pedons
Reaction—neutral or mildly alkaline

Appian Series

The Appian series consists of very deep, well drained, moderately slowly permeable soils that formed in loamy mixed alluvium over sandy lacustrine material. Appian soils are on lake plains. Slopes are 0 to 2 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 53 degrees F.

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Natargids

Typical pedon: Appian sandy loam, moderately saline-sodic, 0 to 2 percent slopes, in an area of Isole-Parran-Appian association where pebbles cover approximately 5 percent of the surface.

A—0 to 4 inches; light gray (10YR 7/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine, common fine, and few coarse vesicular pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (1 to 8 inches thick)

Btk—4 to 9 inches; pale brown (10YR 5/3) sandy clay loam, brown (10YR 6/3) moist; weak medium prismatic structure; hard, firm, very sticky and plastic; few very fine roots; common very fine tubular pores; common thin clay films on faces of pebbles and lining pores; 5 percent pebbles; few fine lime filaments; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (5 to 12 inches thick)

C—9 to 18 inches; light brownish gray (10YR 6/2) loamy sand, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 10 inches thick)

2C1—18 to 25 inches; light brownish gray (10YR 6/2), stratified sand and sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (7 to 18 inches thick)

2C2—25 to 56 inches; light brownish gray (10YR 6/2) sand, very dark grayish brown (10YR 3/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (15 to 30 inches thick)

3C—56 to 60 inches; light gray (5Y 7/2) silt loam, olive gray (5Y 5/2) moist; massive; slightly hard, friable, slightly sticky and plastic; few very fine roots; few very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8).

Type location: Pershing County, Nevada; approximately 12 miles southeast of Lovelock, in the Carson Sink, about 1,100 feet north and 900 feet west of the southeast corner of sec. 17, T. 25 N., R. 33 E.

Range in Characteristics

Soil moisture: Usually dry; moist for short periods in winter and early spring

Soil temperature: 53 to 57 degrees F

Combined thickness of the A and Btk horizons: 7 to 18 inches

Depth to the sandy 2C horizon: 7 to 18 inches

A horizon:
Value—6 or 7 dry, 3 or 4 moist
Chroma—1 or 2
Structure—weak or moderate subangular blocky or thin to thick platy; massive or single grain in some pedons
Reaction—moderately alkaline or strongly alkaline

Btkn horizon:
Hue—10YR or 7.5YR
Value—4 to 6 dry, 4 or 5 moist
Chroma—2, 3, or 4
Texture—dominantly clay loam, but sandy clay loam
in some pedons
Content of clay—27 to 35 percent
Exchangeable sodium—20 to 50 percent
Structure—moderate or strong, fine or coarse,
columnar or prismatic
Reaction—strongly alkaline or very strongly alkaline
Other features—few or common fine or medium
white lime or gypsum segregations and
filaments

2C horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—6 or 7 dry, 3 to 5 moist
Chroma—2 or 3
Texture—predominantly sand that is stratified with
coarse sand, fine sand, loamy sand, loamy fine
sand, fine sandy loam, or sandy loam
Content of rock fragments—as much as 75 percent
pebbles in some pedons
Relict iron mottles—few to many fine to large, faint
to prominent high-chroma mottles that have hue
of 10YR, 7.5YR, or 5YR
Reaction—mildly alkaline to strongly alkaline

3C horizon (not in all pedons):
Depth to the horizon—40 to 60 inches
Texture—clay, silty clay, silty clay loam, or silt loam

Argenta Series

The Argenta series consists of very deep, somewhat
poorly drained, moderately permeable soils that formed
in loamy alluvium derived from mixed rock sources.
Argenta soils are on lake plains. Slopes are 0 to 2
percent. The mean annual precipitation is about 7
inches, and the mean annual temperature is about 48
degrees F.

Taxonomic class: Coarse-loamy, mixed (calcareous),
mesic Aeric Halaquepts

Typical pedon: Argenta very fine sandy loam, 0 to 2
percent slopes, in an area where pebbles cover
approximately 3 percent of the surface:
A1—0 to 1 inch; very pale brown (10YR 7/3) very fine
sandy loam, brown (10YR 4/3) moist; moderate
medium platy structure; soft, very friable, nonsticky
and nonplastic; few very fine roots; common very
fine tubular pores; strongly effervescent; very
strongly alkaline (pH 9.4); clear smooth boundary.
(1 to 6 inches thick)
A2—1 to 6 inches; very pale brown (10YR 7/3) very fine
sandy loam, brown (10YR 4/3) moist; moderate thin
platy structure; soft, very friable, nonsticky and
nonplastic; few very fine roots; common very fine
tubular pores; strongly effervescent; very strongly
alkaline (pH 9.4); clear smooth boundary. (0 to 8
inches thick)
BA—6 to 17 inches; pale brown (10YR 6/3) fine sandy
loam, brown (10YR 4/3) moist; massive; soft, very
friable, nonsticky and nonplastic; common fine and
medium roots; common fine tubular pores; strongly
effervescent; very strongly alkaline (pH 9.4); clear
smooth boundary. (4 to 11 inches thick)
Bk—17 to 22 inches; pale brown (10YR 6/3) loam,
brown (10YR 4/3) moist; massive; slightly hard, very
friable, nonsticky and nonplastic; common very fine
and fine roots; common very fine tubular pores;
common fine lime filaments; strongly effervescent;
strongly alkaline (pH 9.0); clear smooth boundary.
(0 to 6 inches thick)
Bqk1—22 to 33 inches; pale brown (10YR 6/3) fine
sandy loam, brown (10YR 4/3) moist; few faint
mottles, brown (7.5YR 5/6) moist; massive;
slightly hard, very friable, nonsticky and nonplastic;
few very fine roots; few very fine tubular pores; 25
percent weak, 10- to 25-millimeter durinodes;
few fine lime filaments; strongly effervescent; strongly
alkaline (pH 8.8); clear smooth boundary. (10 to 20
inches thick)
Bqk2—33 to 36 inches; pale brown (10YR 6/3) fine
sandy loam, brown (10YR 4/3) moist; few faint
mottles, brown (7.5YR 5/6) moist; moderate
thin platy structure; slightly hard, friable, nonsticky
and slightly plastic; few very fine roots; few very fine
tubular pores; 10 percent weak, 10- to 25-millimeter
durinodes; strongly effervescent; few fine lime
filaments; strongly alkaline (pH 8.8); clear smooth
boundary. (3 to 25 inches thick)
Bq—36 to 60 inches; very pale brown (10YR 8/3)
gravelly sandy loam, brown (10YR 5/3) moist;
moderate thin platy structure; slightly hard, friable,
nonsticky and nonplastic; few very fine roots; few
very fine tubular pores; 15 percent pebbles; 35
percent weak, 10- to 25-millimeter durinodes;
strongly effervescent; strongly alkaline (pH 8.8).

Type location: Pershing County, Nevada; in the
northern part of Dixie Valley, about 1,200 feet west
and 90 feet north of the southeast corner of sec. 21,
T. 25 N., R. 38 E.

Range in Characteristics

Soil moisture: A seasonal high water table at a depth of
32 to 40 inches from February through July  
Soil temperature: 47 to 52 degrees F  
Depth to the Bqk horizon: 12 to 24 inches  
Control section: Content of clay—8 to 18 percent;  
content of rock fragments—as much as 15 percent  
pebbles; texture—very fine sandy loam or fine  
sandy loam having 15 to 40 percent fine sand or  
coarser sand  
Reaction throughout the profile: Moderately alkaline to  
very strongly alkaline  
Relict mottles: In the upper part of some pedons  
Salt and sodium: Slightly to strongly saline and strongly  
sodium affected to a depth of 24 to 30 inches,  
becoming less saline and sodic with depth;  
exchangeable sodium ranging from 15 to 70 percent  
in half or more of the upper 15 inches, decreasing  
with depth  
Other features: Unconformable strata of loamy fine  
sand, fine sand, gravelly or very gravelly sand, or  
very coarse sand below a depth of 40 inches in  
some pedons  
A horizon:  
Value—6 to 8 dry, 4 or 5 moist  
Chroma—2 or 3  
Bqk horizon:  
Hue—10YR or 7.5YR  
Value—6 to 8 dry, 4 or 5 moist  
Chroma—2 to 4  
Texture—very fine sandy loam, fine sandy loam, silt  
loam, or loam  
Other features—15 to 70 percent durinodes in a  
friable matrix  

Atlow Series  
The Atlow series consists of shallow, well drained,  
moderately slowly permeable soils that formed in  
residuum derived from chert, rhyolitic tuff, argillite,  
shale, mudstone, and sands. Atlow soils are on side  
slopes of mountains. Slopes are 4 to 75 percent. The  
mean annual precipitation is about 10 inches, and the  
mean annual temperature is about 46 degrees F.  
Taxonomic class: Loamy-skeletal, mixed, mesic Lithic  
Xerollic Haplargids  
Typical pedon: Atlow very gravelly loam, 30 to 50  
percent slopes, in an area of Atlow-Wiskan association  
where pebbles cover approximately 55 percent, cobbles  
5 percent, and stones 2 percent of the surface:  
A1—0 to 2 inches; pale brown (10YR 6/3) very gravelly  
loam, brown (10YR 4/3) moist; moderate very thin  
platy structure; slightly hard, very friable, slightly  
sticky and slightly plastic; common very fine roots;  
many very fine vesicular pores; 40 percent pebbles;  
moderately alkaline (pH 8.2); clear smooth  
boundary. (2 to 5 inches thick)  
A2—2 to 4 inches; pale brown (10YR 6/3) very gravelly  
loam, brown (10YR 4/3) moist; moderate very thin  
platy structure; soft, very friable, slightly sticky and  
slightly plastic; many very fine roots; common very  
fine tubular pores; 35 percent pebbles; moderately  
alkaline (pH 8.2); clear smooth boundary. (0 to 4  
inches thick)  
AB—4 to 6 inches; light gray (10YR 7/2) very gravelly  
loam, grayish brown (10YR 5/2) moist; weak fine  
subangular blocky structure; soft, very friable,  
slightly sticky and slightly plastic; many very fine  
roots; common very fine tubular pores; 45 percent  
pebbles, 2 percent cobbles; moderately alkaline (pH  
8.4); clear smooth boundary. (0 to 4 inches thick)  
Bt—6 to 15 inches; pale brown (10YR 6/3) very gravelly  
clay loam, dark brown (10YR 4/3) moist; moderate  
medium subangular blocky structure; slightly hard,  
friable, sticky and plastic; common very fine and few  
fine roots; common very fine tubular pores; 40  
percent pebbles, 2 percent cobbles; thin lime  
coatings on the underside of pebbles; moderately  
alkaline (pH 8.2); abrupt smooth boundary. (8 to 12  
inches thick)  
R—15 inches; argillite.  
Type location: Pershing County, Nevada; in the  
southern part of the Tobin Range, about 500 feet  
east and 1,500 feet north of the projected southwest  
corner of sec. 21, T. 27 N., R. 39 E.  

Range in Characteristics  
Soil moisture: Usually dry during the growing season;  
moot in winter and spring, dry from June through  
October  
Soil temperature: 48 to 52 degrees F  
Thickness of the solum: 14 to 20 inches  
Depth to bedrock: 14 to 20 inches  
A horizon:  
Value—6 or 7 dry, 3, 4, or 5 moist  
Chroma—2 or 3  
Reaction—mildly alkaline or moderately alkaline  
Bt horizon:  
Value—5, 6, or 7 dry, 4 or 5 moist  
Chroma—2 to 4  
Texture—very gravelly clay loam or very cobbly clay  
loam  
Content of clay—27 to 35 percent  
Content of rock fragments—35 to 50 percent,  
dominantly pebbles and cobbles  
Structure—angular or subangular blocky  
Reaction—moderately alkaline or strongly alkaline
Carbonates—a noncalcareous matrix; thin lime coatings on the underside of rock fragments

**Bango Series**

The Bango series consists of very deep, well drained, moderately permeable soils that formed in mixed alluvium over lacustrine deposits. Bango soils are on lake plain terraces. Slopes are 2 to 8 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 51 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Haplud Natrargids

**Typical pedon:** Bango very gravelly loamy sand, 2 to 8 percent slopes, in an area of Bango-Appian association where pebbles cover approximately 40 percent and cobbles 5 percent of the surface:

A1—0 to 2 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many fine vesicular pores; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 7 inches thick)

A2—2 to 5 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine and few fine tubular pores; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 3 inches thick)

Bt—in—5 to 9 inches; light yellowish brown (10YR 6/4) loam, brown (10YR 4/3) moist; weak coarse prismatic structure; hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; few thin clay films on faces of peds and lining pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 13 inches thick)

C1—9 to 14 inches; pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 8 inches thick)

C2—14 to 36 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 10 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (10 to 24 inches thick)

2C—36 to 60 inches; light gray (10YR 7/2) fine sandy loam, grayish brown (10YR 5/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Pershing County, Nevada; approximately 12 miles southeast of Lovelock, in the Carson Sink, about 1,100 feet north and 2,400 feet east of the southwest corner of sec. 27, T. 25 N., R. 32 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods in winter and early spring

**Soil temperature:** 53 to 57 degrees F

**Depth to lacustrine material:** 10 to 26 inches

**Depth to the base of the natic horizon:** 6 to 20 inches

**Control section:** Content of clay—18 to 30 percent

A horizon:

Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Structure—moderate or strong, medium or thick platy

Bt horizon:

Hue—7.5YR or 10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 to 4
Texture—loam, clay loam, or sandy clay loam
Content of clay—20 to 30 percent
Structure—medium or coarse prismatic parting to weak or moderate, fine or medium subangular blocky
Reaction—moderately alkaline or strongly alkaline
Dendritic tuff layer—commonly discontinuous, within 10 inches of the base of the natic horizon; not in all pedons

C horizon:

Texture—finely stratified fine sandy loam, very fine sandy loam, silt loam, loam, or silty clay
Content of clay—18 to 30 percent
Reaction—moderately alkaline or strongly alkaline
Relict iron mottles—generally below a depth of 24 inches

**Batan Series**

The Batan series consists of very deep, moderately well drained, moderately slowly permeable soils that formed in alluvium derived from mixed rock sources. Batan soils are on alluvial flat remnants and lake plain terraces. Slopes are 0 to 2 percent. The mean annual
precipitation is about 7 inches, and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Durothric Torriorthents

**Typical pedon:** Batan silt loam, 0 to 2 percent slopes, in an area of Batan-Wendane-Valmy association:

A—0 to 3 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak very thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many very fine vesicular and few very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 6 inches thick)

C—3 to 10 inches; pale brown (10YR 6/3) silt loam, yellowish brown (10YR 5/4) moist; moderate thin platy structure; slightly hard, very friable, sticky and slightly plastic; many very fine and few fine roots; many very fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 19 inches thick)

Cq—10 to 30 inches; light brownish gray (10YR 6/2) silt loam, grayish brown (10YR 5/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; 20 percent 10- to 15-millimeter, hard, firm, brittle durinodes; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 16 inches thick)

Cqk—30 to 37 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; few fine faint iron mottles, brown (7.5YR 5/4) and dark brown (7.5YR 4/4) moist; massive; hard, friable, slightly sticky and plastic; common very fine roots; many very fine tubular pores; 25 percent 10- to 15-millimeter, hard, firm, brittle durinodes; few very fine lime filaments; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 13 inches thick)

Cqy—37 to 47 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; few fine distinct iron mottles, strong (7.5YR 5/6 and 5/8) moist; many fine manganese stains; massive; hard, firm, sticky and plastic; common very fine roots; many very fine tubular pores; 20 percent 10- to 15-millimeter, hard, firm, brittle durinodes; common fine gypsum crystals; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 12 inches thick)

Cq—47 to 60 inches; light brownish gray (10YR 6/2) loamy fine sand, brown (10YR 5/3) moist; few fine distinct iron mottles, strong (7.5YR 5/6 and 5/8) moist; many fine manganese stains; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; weak cementation; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (8 to 18 inches thick)

C—60 to 65 inches; light gray (2.5YR 7/2) silt loam, light brownish gray (2.5Y 6/2) moist; few fine distinct iron mottles, strong brown (7.5YR 5/6 and 5/8) moist; many fine manganese stains; massive; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Pershing County, Nevada; approximately 2 miles north of Oreana, near the Humboldt River, about 400 feet north and 250 feet east of the southwest corner of sec. 20, T. 29 N., R. 33 E.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist in winter and spring; a water table directly below a depth 60 inches in most years

*Soil temperature:* 47 to 53 degrees F

*Control section:* Content of clay—average of 20 to 30 percent; texture—dominantly silt loam or silty clay loam, but may be stratified fine sandy loam to silty clay

*Depth to the Cq horizon:* 9 to 24 inches

*Salt and sodium:* Salt and sodium affected in most pedons; not affected in the upper horizons in some pedons near drainageways and stream channels

*Mottles:* Faint or distinct iron mottles commonly in any horizon below a depth of 10 inches

*Gypsum:* Gypsum crystals below a depth of 20 inches in some pedons

**A horizon:**

Hue—2.5Y or 10YR
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 to 4
Structure—platy or granular
Consistency—slightly hard or hard, slightly sticky or sticky, and slightly plastic or plastic
Reaction—moderately alkaline to very strongly alkaline
Other features—slightly effervescent to violently effervescent

**C horizon:**

Hue—2.5Y or 10YR
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 to 4
Structure—platy, angular blocky, or prismatic; massive in some pedons
Reaction—strongly alkaline or very strongly alkaline
Other features—strongly effervescent or violently effervescent

*Cq and Cqk* horizons:
Hue—2.5Y or 10YR
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 to 4
Cementation—20 to 40 percent durinodes;
subhorizons with as much as 70 percent weak, discontinuous silica cementation in some pedons

*2C* horizon:
Unconformable, stratified very gravelly sands and fine sands below a depth of 50 inches in some pedons

**Bedwyr Series**

The Bedwyr series consists of shallow, well drained, very slowly permeable soils that formed in residuum derived from Tertiary sediments. Bedwyr soils are on side slopes of low hills. Slopes are 15 to 30 percent. The mean annual precipitation is about 4 inches, and the mean annual temperature is about 52 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Typic Natrargids

**Typical pedon:** Bedwyr stony loam, 15 to 30 percent slopes, in an area of Bedwyr-Bedzee-Jobpeak association:

*A*—0 to 3 inches; pale brown (10YR 6/3) stony loam,
yellowish brown (10YR 5/4) moist; strong medium
platy structure parting to strong fine granular;
slightly hard, friable, sticky and very plastic; few fine
and medium roots; common fine vesicular and fine
interstitial pores; 1 percent stones, 10 percent
pebbles; violently effervescent; very strongly
alkaline (pH 9.4); abrupt smooth boundary. (2 to 4
inches thick)

*Btn*—3 to 15 inches; yellowish brown (10YR 5/4) clay,
dark yellowish brown (10YR 4/4) moist; strong
medium prismatic structure parting to strong
medium angular blocky; very hard, firm, very sticky
and very plastic; few medium and coarse roots; few
fine and medium tubular pores; many thick clay
films on faces of peds and lining pores; violently
effervescent; very strongly alkaline (pH 9.4); abrupt
wavy boundary. (7 to 12 inches thick)

*Crs*—15 inches; weathered Tertiary sediments.

**Type location:** Pershing County, Nevada; in the
northwestern part of the Stillwater Range, about 200
feet south and 300 feet west of the northeast corner
of sec. 28, T. 25 N., R. 36 E.

**Range in Characteristics**

*Soil moisture:* Usually dry; intermittently moist in winter
and spring

*Soil temperature:* 53 to 57 degrees F

*Depth to the base of the natic horizon:* 9 to 15 inches

*Depth to paralithic contact:* 10 to 20 inches

**A horizon:**
Value—6 or 7 dry, 3 to 5 moist
Chroma—2 or 3 dry or moist
Reaction—mildly alkaline to very strongly alkaline

**Btr horizon:**
Hue—10YR or 7.5YR
Value—5 or 6 dry, 4 to 6 moist
Chroma—3 or 4 dry or moist
Texture—clay or silty clay
Content of clay—40 to 55 percent
Content of rock fragments (not in all pedons)—as
much as 15 percent
Structure—moderate or strong, fine or medium
prismatic
Reaction—mildly alkaline to very strongly alkaline

**C horizon (not in all pedons):**
Hue—10YR, 7.5YR, or 2.5Y
Value—6 or 7 dry, 5 to 7 moist
Chroma—4 or 5 dry or moist
Texture—gravelly silty clay or gravelly clay
Content of clay—45 to 60 percent
Content of rock fragments—15 to 30 percent
pebbles
Reaction—moderately alkaline or strongly alkaline

**Bedzee Series**

The Bedzee series consists of very shallow, well drained soils that formed in residuum derived from clayey lacustrine sediments and having a thin mantle of loess. Bedzee soils are on side slopes of low hills. Slopes are 15 to 30 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 52 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Xericolic Haplargids

**Typical pedon:** Bedzee very stony loam, 15 to 30
percent slopes, in an area of Bedwyr-Bedzee-Jobpeak
association where stones cover approximately 5 percent
of the surface:

*A*—0 to 4 inches; light brownish gray (10YR 6/2) very
stony loam, brown (10YR 5/3) moist; moderate
medium subangular blocky structure; soft, very
friable, nonsticky and nonplastic; common fine
roots; common fine tubular pores; 5 percent stones,
10 percent pebbles, 10 percent cobbles; moderately
alkaline (pH 7.9); abrupt smooth boundary. (3 to 7 inches thick)
Bt—4 to 10 inches; pale brown (10YR 6/3) gravelly clay, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, very sticky and very plastic; many very fine and fine and few medium roots; common fine and medium tubular pores; 15 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (6 to 13 inches thick)
Cr—10 inches; weathered, mottled, clayey Tertiary sediments.

**Type location:** Pershing County, Nevada; in the northern part of the Stillwater Range, about 200 feet west and 700 feet north of the southeast corner of sec. 21, T. 25 N., R. 36 E.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist in winter and spring
*Soil temperature:* 54 to 59 degrees F
*Depth to paralithic horizon:* 10 to 20 inches
*Control section:* Content of clay—35 to 60 percent; content of rock fragments—15 to 35 percent

**A horizon:**
Value—4 or 5 moist
Chroma—2, 3, or 4

**Bt horizon:**
Chroma—3 or 4
Content of clay—40 to 60 percent
Structure—prismatic or angular blocky; massive in the lower part in some pedons
Reaction—moderately alkaline or strongly alkaline

**Benin Series**

The Benin series consists of very deep, well drained, very slowly permeable soils that formed in thin deposits of alluvium and loess high in content of volcanic ash over moderately fine textured and fine textured lacustrine sediments. Benin soils are on lake plain terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine, montmorillonitic (calcareous), mesic Typic Torriorthents

**Typical pedon:** Benin silt loam, 0 to 2 percent slopes, in an area of Bubus-Benin-Wendane association where pebbles cover approximately 2 percent of the surface:
A1—0 to 4 inches; light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; strong very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine, fine, and medium vesicular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 4 inches thick)
A2—4 to 9 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; moderate very thin platy structure; slightly hard, very friable, sticky and plastic; common very fine and few fine and medium roots; few very fine tubular pores; common thin silica coatings on faces of pedds; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (0 to 6 inches thick)
2C—9 to 19 inches; very pale brown (10YR 7/3) silty clay, brown (10YR 5/3) moist; moderate very fine subangular blocky structure; slightly hard, friable, very sticky and very plastic; common very fine and few fine and medium roots; few very fine tubular pores; very thin silica coatings on faces of pedds; few fine manganese stains; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 11 inches thick)
2Cy1—19 to 33 inches; very pale brown (10YR 7/4) clay, light yellowish brown (10YR 6/4) moist; weak medium prismatic structure; hard, firm, very sticky and very plastic; few very fine roots; many very fine and common fine tubular pores; 10 percent durinodes and few very thin silica coatings on faces of pedds; few fine manganese stains; fine and medium gypsum filaments; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (10 to 29 inches thick)
2Cy2—33 to 44 inches; very pale brown (10YR 7/4) clay, yellowish brown (10YR 5/4) moist; weak medium prismatic structure; hard, firm, very sticky and very plastic; few very fine roots; many very fine and few fine tubular pores; few fine faint reddish yellow (7.5YR 6/6) relict mottles; very thin silica coatings on faces of pedds; many fine and common medium manganese stains; common medium gypsum filaments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 12 inches thick)
2Cy—44 to 60 inches; very pale brown (10YR 7/4) clay, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure; hard, firm, very sticky and very plastic; many very fine and fine and medium tubular pores; many fine and medium faint reddish yellow (7.5YR 6/6) relict mottles; few fine gypsum filaments; few very thin silica coatings on faces of pedds; common fine manganese stains; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Pershing County, Nevada; in the western part of Buffalo Valley, about 400 feet east
and 700 feet south of the northwest corner of sec. 19, T. 29 N., R. 41 E.

Range in Characteristics

Soil moisture: Intermittently moist in winter and spring, dry in summer and fall
Soil temperature: 47 to 52 degrees F
Depth to lacustrine material: 1 to 10 inches
Reaction throughout the profile: Moderately alkaline to very strongly alkaline
Other features: Electrical conductivity of 4 to 32 millimhos and exchangeable sodium making up 15 to 60 percent of the volume between depths of 1 and 36 inches

A horizon:
- Value—6 or 7 dry
- Chroma—1 or 2
- Effervescence—non-effervescent to strongly effervescent

C horizon (not in all pedons):
- Hue—10YR or 2.5Y
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3
- Texture—silt loam or loam
- Effervescence—non-effervescental to violently effervescental
- Gypsum—common in some pedons

2C horizon:
- Hue—10YR, 2.5Y, or 5Y
- Value—7 or 8 dry, 4 to 6 moist
- Chroma—2 or 3
- Texture—silty clay or clay
- Structure—weak to strong, medium or coarse prismatic, commonly parting to strong medium or coarse angular blocky; massive in some pedons
- Other features—few to many silica coatings on faces of peds in some pedons; gypsum in some subhorizons in most pedons; as much as 10 percent durinodes in some pedons

Beoska Series

The Beoska series consists of very deep, well drained, moderately permeable soils that formed in loess over loamy and gravelly alluvium derived from mixed sources. Beoska soils are on fan piedmont remnants. Slopes are 2 to 15 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 49 degrees F.

Taxonomic class: Fine-loamy, mixed, mesic Duric Natrargids

Typical pedon: Beoska very fine sandy loam, 2 to 8 percent slopes, in an area of Oxcored-Weso-Beoska association where Pebbles cover approximately 2 percent of the surface:
A1—0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine common medium vesicular pores; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 7 inches thick)
A2—2 to 7 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 6 inches thick)
A3—7 to 13 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak very thin platy structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine few roots; many very fine tubular pores; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 10 inches thick)
Bt—13 to 19 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; few thin clay films on faces of peds and lining pores; 5 percent pebbles; strongly alkaline (pH 8.6); clear smooth boundary. (4 to 13 inches thick)
Bt—19 to 25 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; common thin clay films on faces of peds and lining pores; 10 percent pebbles; common fine lime filaments; slightly effervescetal; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 8 inches thick)
2Bq—25 to 44 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, nonsticky and nonplastic; common very fine and few fine roots; few very fine tubular pores; weak, discontinuous silica cementation; lime coatings on the underside of rock fragments; 30 percent
pebbles, 2 percent cobbles; common fine and medium lime filaments; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (15 to 35 inches thick)
2Bk—44 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 45 percent pebbles, 2 percent cobbles; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Pershing County, Nevada; in the southern part of Grass Valley, about 2,250 feet east and 2,200 feet south of the northwest corner of sec. 32, T. 32 N., R. 38 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to the 2Bqk horizon:** 16 to 26 inches

**A horizon:**
- Hue—10YR or 2.5Y
- Value—6 or 7 dry
- Chroma—2 or 3
- Structure—platy or subangular blocky

**Bth horizon:**
- Value—3 or 4 moist, 6 or 7 dry
- Chroma—3 or 4
- Texture—silty clay loam, silt loam, or clay loam
- Content of clay—25 to 35 percent
- Content of rock fragments—as much as 15 percent, mainly pebbles
- Reaction—moderately alkaline or strongly alkaline
- Other features—secondary carbonates in some subhorizons

**Bqk horizon:**
- Value—7 or 8 dry, 4 to 6 moist
- Texture—very fine sandy loam, fine sandy loam, or sandy loam
- Content of clay—5 to 15 percent
- Content of rock fragments—15 to 35 percent within a depth of 40 inches, 15 to 65 percent below a depth of 40 inches, mainly pebbles
- Consistence—soft to hard, very friable to firm
- Reaction—moderately alkaline or strongly alkaline
- Other features—either 20 to 40 percent durinodes in a friable matrix or weak or strong, discontinuous silica cementation

**Bezo Series**

The Bezo series consists of very deep, poorly drained, moderately permeable soils that formed in lacustrine sediments. Bezo soils are on lake plains.

Slopes are 0 to 2 percent. The mean annual precipitation is about 6 inches, and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Bezo silty clay, 0 to 2 percent slopes, in an area of Yobe-Bezo-Yobe, occasionally flooded, association:

A1—0 to 1 inch; brown (10YR 4/3) silty clay, very pale brown (10YR 7/3) dry; strong medium platy structure; hard, friable, very sticky and very plastic; many very fine and few fine vesicular pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (1 to 5 inches thick)

A2—1 to 3 inches; brown (10YR 4/3) silty clay, very pale brown (10YR 7/3) dry; moderate thin platy structure; slightly hard, very friable, very sticky and very plastic; few very fine roots; few very fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 8 inches thick)

2By1—3 to 7 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; weak medium granular structure; soft, very friable, sticky and plastic; common very fine roots; many very fine interstital pores; common fine soft masses of gypsum; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (3 to 12 inches thick)

2By2—7 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct dark brown (7.5YR 4/4) iron mottles, very pale brown (10YR 7/3) dry; massive; slightly hard, friable, sticky and plastic; common very fine roots; many very fine tubular pores; common fine filaments of gypsum; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (6 to 15 inches thick)

2C—15 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct dark brown (7.5YR 4/4) iron mottles, pale brown (10YR 6/3) dry; massive; slightly hard, friable, sticky and plastic; few very fine roots; many very fine tubular pores; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 20 inches thick)

2Ck—32 to 42 inches; pale brown (10YR 6/3) silty clay loam; common fine distinct brown (7.5YR 5/4) iron mottles, white (10YR 8/2) dry; massive; slightly hard, friable, sticky and plastic; few very fine roots; many very fine and few fine tubular pores; common medium lime filaments; violently effervescent; moderately alkaline (pH 8.2); gradual smooth boundary. (0 to 15 inches thick)

3C—42 to 60 inches; pale brown (10YR 6/3) silty clay; few fine distinct yellowish brown (10YR 5/4) iron
mottles, white (10YR 8/2) dry; massive; slightly hard, friable, very sticky and very plastic; many very fine tubular pores; violently effervescent; moderately alkaline (pH 8.2).

**Type location:** Pershing County, Nevada; approximately 23 miles southeast of Mill City, in Buena Vista Valley, about 500 feet east and 350 feet north of the southwest corner of sec. 22, T. 29 N., R. 36 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; saturated in some horizons between depths of 12 and 24 inches for at least 1 month during most years

**Soil temperature:** 53 to 56 degrees F

**Depth to the By horizon:** 3 to 13 inches

**Control section:** Content of clay—27 to 35 percent

**Other features:** Thin strata of silty clay in some pedons

**Reaction:** Strongly alkaline in the upper part of the profile, becoming moderately alkaline with depth

**A horizon:**
- Value—4 or 5 moist, 6 or 7 dry

**By horizon:**
- Value—4 or 5 moist, 6 or 7 dry
- Chroma—3 or 4

**C horizon:**
- Value—5 or 6 moist, 6 to 8 dry
- Chroma—3 or 4 moist, 2 or 3 dry
- Reaction—moderately alkaline or strongly alkaline
- Carbonates—strongly effervescent or violently effervescent; lime accumulations commonly in any subhorizon
- Other features—texture of silty clay below a depth of 40 inches in most pedons

### Biddleman Series

The Biddleman series consists of very deep, well drained, moderately permeable soils that formed in a thin mantle of alluvium over lacustrine terrace material. Biddleman soils are on beach terraces. Slopes are 2 to 8 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Natragids

**Typical pedon:** Biddleman very stony sandy loam, 2 to 8 percent slopes, in an area of Biddleman-Trocken-Biddleman, stony, association where pebbles cover approximately 20 percent and stones 5 percent of the surface:
- A—0 to 3 inches; light brownish gray (10YR 6/2) very stony sandy loam, dark grayish brown (10YR 4/2) moist; moderate very thin platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine vesicular pores; 5 percent stones, 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 5 inches thick)

**Bn—**3 to 8 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; strong medium prismatic structure; hard, firm, sticky and plastic; many very fine roots; many very fine tubular pores; common thin clay films on faces of ped; 20 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (3 to 12 inches thick)

**Bn—**8 to 13 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common fine tubular pores; 30 percent pebbles; few thin clay films on faces of ped; lime coatings on the underside of rock fragments; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 5 inches thick)

**2Bk—**13 to 22 inches; light gray (2.5YR 7/2) very gravelly loamy fine sand, pale yellow (2.5YR 7/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 45 percent pebbles; lime coatings on the underside of rock fragments; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (6 to 12 inches thick)

**2Bk—**22 to 29 inches; dark grayish brown (2.5Y 4/2) very gravelly sand, light olive brown (2.5Y 5/4) moist; single grain; loose, nonsticky and nonplastic; few very fine interstitial pores; 50 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (0 to 8 inches thick)

**2C1—**29 to 60 inches; very pale brown (10YR 7/3) extremely gravelly sand, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine tubular pores; few weakly silica-cemented fragments; 50 percent pebbles, 10 percent cobbles; lime coatings on the underside of rock fragments; strongly effervescent; strongly alkaline (pH 9.0).

**Type location:** Pershing County, Nevada; approximately 20 miles southeast of Lovelock, in Buena Vista Valley, about 1,500 feet east and 700 feet north of the southwest corner of sec. 10, T. 25 N., R. 34 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; intermittently moist in winter and spring
Soil temperature: 53 to 55 degrees F
Combined thickness of the A and Bt horizons: 8 to 17 inches
Control section: Content of clay—average of 7 to 15 percent where the base of the Bt horizon is within a depth of 10 inches; content of rock fragments, mainly pebbles—average of 50 to 70 percent but ranging from 20 to 80 percent in subhorizons
Reaction throughout the profile: Moderately alkaline to very strongly alkaline
Other features: Discontinuous, weakly cemented to strongly cemented lithoid tufa occurring sporadically along beach terraces, generally below a depth of 36 inches but locally as shallow as 24 inches

A horizon:
Hue—10YR or 2.5Y
Value—3, 4, or 5 moist
Structure—weak or moderate, very thin to thick platy; granular in some pedons

Bt horizon:
Hue—10YR or 2.5Y
Value—3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—loam, sandy clay loam, or clay loam that has common thin subhorizons of sandy loam
Content of clay—20 to 30 percent
Content of rock fragments—average of 20 to 35 percent, mainly pebbles
Exchangeable sodium—15 to 25 percent
Other features—lime coatings on the underside of rock fragments in the Btk horizon in some pedons

2C horizon:
Hue—10YR or 2.5Y
Value—6 to 8 dry, 4 to 6 moist
Chroma—2 to 4
Texture—loamy fine sand, loamy coarse sand, or sand
Content of clay—2 to 10 percent
Content of rock fragments—average of 60 to 80 percent, mainly pebbles
Other features—discontinuous, weakly cemented to strongly cemented lithoid tufa below a depth of 24 inches

Blackhawk Series

The Blackhawk series consists of shallow, well drained, moderately permeable soils that formed in loess and mixed alluvium. Blackhawk soils are on fan piedmont remnants, fan aprons, and partial ballenas. Slopes are 0 to 50 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 47 degrees F.

Taxonomic class: Loamy, mixed, mesic, shallow Entic Durorthids

Typical pedon: Blackhawk silt loam, 0 to 2 percent slopes:

A—0 to 3 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak thick platy structure; slightly hard, friable, slightly sticky and slightly plastic; few roots; many fine and medium vesicular pores; polygonal cracks 1 to 1 1/2 inches deep and 3 to 6 inches apart on the surface; strongly alkaline (pH 8.6); abrupt smooth boundary. (2 to 8 inches thick)

Bw—3 to 14 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; weak medium and fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common fine roots; many very fine and fine interstitial pores; moderately alkaline (pH 8.3); abrupt smooth boundary. (6 to 15 inches thick)

Bqm—14 to 16 inches; light brownish gray (10YR 6/2), strongly silica-cemented duripan, dark grayish brown (10YR 4/2) moist; strong thin platy structure; very hard, very firm; few fine roots; many very fine interstitial pores; common thin silica films coating pores and bridging sand grains and discontinuous silica-cemented laminae; very strongly alkaline (pH 8.8); abrupt smooth boundary. (2 to 5 inches thick)

Bqk—16 to 21 inches; pale brown (10YR 6/3) loam, dark grayish brown (10YR 4/2) moist; weak thick platy structure parting to weak fine angular blocky; slightly hard, friable, nonsticky and nonplastic; common very fine roots; many very fine tubular pores; 30 percent very hard, firm, brittle durinodes; a noneffervescent matrix; strongly effervescent in spots; few fine line filaments and coatings on durinodes; strongly alkaline (pH 9.0); abrupt smooth boundary. (0 to 21 inches thick)

Bqkm—21 to 30 inches; pale brown (10YR 6/3), strongly silica-cemented duripan, dark grayish brown (10YR 4/2) moist; weak and moderate thick platy structure; extremely hard, extremely firm; few very fine and fine roots only in seams and between plates; few fine interstitial pores; many fine silica films lining pores and bridging sand grains and common moderately thick, discontinuous silica laminae; white (10YR 8/2) lime coatings on most silica films, mainly on laminae; violently effervescent; very strongly alkaline (pH 9.2); abrupt wavy boundary. (0 to 10 inches thick)

2Bqk—30 to 48 inches; very pale brown (10YR 7/3) coarse sand, brown (10YR 5/3) moist; massive;
slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few fine and many very fine interstitial pores; 30 percent hard, firm, brittle durinodes; violently effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary. (0 to 20 inches thick)

2C—48 to 60 inches; brown (10YR 5/3) very gravelly coarse sand, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 40 percent pebbles; strongly alkaline (pH 8.6).

**Type location:** Pershing County, Nevada; approximately 21 miles south of Winnemucca, about 600 feet east and 1,300 feet south of the north quarter corner of sec. 3, T. 32 N.; R. 38 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and early spring

**Soil temperature:** 47 to 54 degrees F

**Depth to a duripan:** 14 to 20 inches

**Control section:** Content of clay—average of 5 to 10 percent; content of rock fragments—as much as 30 percent, mainly pebbles; content of silt and very fine sand—65 to 80 percent

**A horizon:**
- Hue—10YR or 2.5Y
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3
- Structure—weak or moderate, very thin to thick platy
- Reaction—mildly alkaline to strongly alkaline

**Bw horizon:**
- Hue—10YR or 2.5Y
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3
- Texture—silt loam, loam, or very fine sandy loam
- Content of clay—average of 5 to 10 percent
- Content of rock fragments—0 to 30 percent, mainly pebbles
- Structure—weak or moderate, thin to thick, platy or subangular blocky; massive in some pedons
- Reaction—mildly alkaline to strongly alkaline

**Bq, Bk, and C horizons:**
- Hue—10YR or 2.5Y
- Value—5 to 7 dry, 4 to 6 moist
- Chroma—2 or 3
- Structure—weak to strong, thin to thick platy; massive in some pedons

**Duripan:**
- Consistence—very hard or extremely hard

Reaction—moderately alkaline to very strongly alkaline

Silica cementation—the duripan generally consisting of two or more strongly cemented layers interbedded with weakly silica-cemented material or strata with a friable matrix containing durinodes

**Bk and Bqk horizons:**
- Texture—stratified loam, gravelly coarse sandy loam, or gravelly coarse sand, directly below the upper duripan in most pedons

**2Bqk, 2Bk, and 2C horizons:**
- Texture—unconformable strata of very gravelly sand, extremely gravelly sand, coarse sand, loamy coarse sand, or sandy loam, commonly below a depth of 30 inches
- Other features—strata of clay below a depth of 30 inches in some pedons

**Bliss Series**

The Bliss series consists of moderately deep, well drained, moderately permeable soils that formed in mixed alluvium. Bliss soils are on fan piedmont remnants and partial ballenas. Slopes are 8 to 30 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Haploxerollc Durothids

**Typical pedon:** Bliss fine sandy loam, 2 to 8 percent slopes; in Humboldt County, east part:

**A**—0 to 4 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak thick platy structure; soft, friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; mildly alkaline (pH 7.5); abrupt wavy boundary. (2 to 6 inches thick)

**Bw1**—4 to 13 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine interstitial pores; mildly alkaline (pH 7.5); clear wavy boundary. (6 to 10 inches thick)

**Bw2**—13 to 22 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, friable, nonsticky and nonplastic; common very fine and few fine and medium roots; many very fine interstitial pores; mostly non-effervescent but slightly effervescent in
some spots; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 12 inches thick)

Bk—22 to 28 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; massive; soft, friable, nonsticky and nonplastic; common very fine and few fine and medium roots; many very fine interstitial pores; slightly effervescence; strongly alkaline (pH 9.0); abrupt wavy boundary. (4 to 8 inches thick)

Bqkm—28 to 45 inches; very pale brown (10YR 7/3), strongly cemented duripan, brown (10YR 5/3) moist; moderate thick platy structure; very hard, very firm; common fine faint white (10YR 8/2) lime mottles; roots matted between plates; strongly effervescence; strongly alkaline (pH 9.0).

Type location: Humboldt County, Nevada; approximately 4 miles northeast of Winnemucca, about 800 feet west and 600 feet south of the northeast corner of sec. 14, T. 36 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring

Soil temperature: 48 to 53 degrees F

Depth to a duripan: 20 to 36 inches

Control section: Content of clay—5 to 15 percent;
texture—very fine sandy loam, silt loam, or fine sandy loam containing 15 to 40 percent fine sand or coarser sand; content of rock fragments—as much as 15 percent

A horizon:
Chroma—2 or 3
Reaction—neutral or mildly alkaline

Bw horizon:
Content of clay—8 to 16 percent
Content of rock fragments—as much as 15 percent
Reaction—neutral to moderately alkaline

Bk horizon:
Reaction—strongly alkaline or very strongly alkaline
Calcium carbonate equivalent—as much as 15 percent

Bqkm horizon:
Structure—platy; massive in some pedons
Other features—pebbles underlying the duripan in some pedons

Bluewing Series

The Bluewing series consists of very deep, excessively drained, very rapidly permeable soils that formed in alluvium derived from mixed rock sources. Bluewing soils are on inset fans, alluvial flats, fan collars, and side slopes of fan piedmont remnants. Slopes are 0 to 30 percent. The mean annual precipitation is about 6 inches, and the mean annual temperature is about 53 degrees F.

Taxonomic class: Sandy-skeletal, mixed, mesic Typic Torriorthents

Typical pedon: Bluewing very gravelly loam, 0 to 2 percent slopes, in an area of Genegraf-Chilper-Bluewing association where pebbles cover approximately 30 percent, cobbles 10 percent, and stones 2 percent of the surface:

A—0 to 5 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 5/3) moist; moderate very thin platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine vesicular pores; 40 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 9 inches thick)

Bk1—5 to 13 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine tubular pores; 40 percent pebbles, 5 percent cobbles; strongly effervescence; lime coatings on the underside of pebbles; strongly alkaline (pH 8.6); clear smooth boundary. (5 to 25 inches thick)

Bk2—13 to 27 inches; very pale brown (10YR 7/3) very gravelly loamy coarse sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 45 percent pebbles, 5 percent cobbles, 5 percent stones; strongly effervescence; lime coatings on the underside of rock fragments; strongly alkaline (pH 8.8); clear smooth boundary. (6 to 24 inches thick)

Bk3—27 to 42 inches; very pale brown (10YR 7/3) extremely gravelly loamy coarse sand, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 60 percent pebbles, 10 percent cobbles, 2 percent stones; violently effervescence; lime coatings on all sides of rock fragments; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 16 inches thick)

Bk4—42 to 60 inches; very pale brown (10YR 8/3) extremely gravelly loamy coarse sand, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 50 percent pebbles, 10 percent cobbles, 5 percent stones; violently effervescence; lime coatings on all sides of rock fragments; strongly alkaline (pH 9.0).

Type location: Pershing County, Nevada; in the eastern part of Buena Vista Valley, about 400 feet
south and 900 feet west of the northeast corner of sec. 16, T. 30 N., R. 36 E.

Range in Characteristics

Soil moisture: Usually dry; intermittently moist in winter and early spring
Soil temperature: 53 to 59 degrees F
Reaction throughout the profile: Mildly alkaline to strongly alkaline

A horizon:
Hue—10YR or 2.5Y
Value—5 to 7 dry, 3 to 5 moist
Chroma—2 to 4
Structure—platy or single grain
Consistence—loose, soft, or slightly hard
Other features—noneffervescent to violently effervescent

Bk horizon:
Hue—10YR or 2.5Y
Value—5 to 8 dry, 3 to 5 moist
Chroma—2 to 4
Texture—dominantly loamy coarse sand or coarse sand but may include strata ranging from loamy sand to loam
Content of clay—average of 4 to 8 percent
Content of rock fragments—50 to 80 percent, mainly pebbles ¾ inch to 1¾ inches in diameter but as much as 25 percent cobbles and stones
Structure—massive or single grain

Bojo Series

The Bojo series consists of shallow, well drained, moderately slowly permeable soils that formed in residuum derived from metamorphic or volcanic rocks. Bojo soils are on crests and side slopes of mountains and foothills. Slopes are 4 to 50 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Loamy, mixed, mesic Lithic Haplargids

Typical pedon: Bojo very cobbly loam, 30 to 50 percent slopes, in an area of Bojo, steep-Hoot-Bojo association where pebbles cover approximately 25 percent, cobbles 20 percent, and stones 5 percent of the surface:
A—0 to 3 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and common fine and medium vesicular pores; 20 percent pebbles, 15 percent cobbles, 2 percent stones; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 5 inches thick)
Bt—3 to 10 inches; pale brown (10YR 6/3) gravelly clay loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 10 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 10 inches thick)
R—10 inches; unweathered andesite.

Type location: Pershing County, Nevada; in the southern part of the Tobin Range, about 100 feet west and 1,800 feet south of the northeast corner of sec. 5, T. 26 N., R. 39 E.

Range in Characteristics

Soil moisture: Usually dry during the growing season; moist in winter and spring, dry from June through October
Soil temperature: 47 to 52 degrees F
Depth to bedrock: 5 to 14 inches
Control section: Content of clay—18 to 35 percent; content of rock fragments—15 to 35 percent; reaction—mildly alkaline or moderately alkaline

A horizon:
Value—6 or 7 dry, 4 or 5 moist
Chroma—2, 3, or 4

Bk horizon:
Value—5 or 6 dry, 4 or 5 moist
Chroma—2, 3, or 4
Content of rock fragments—10 to 25 percent, dominantly pebbles
Texture—loam, clay loam, sandy clay loam, gravelly clay loam, or gravelly loam
Content of clay—25 to 35 percent
Other features—slightly calcareous in some pedons

Bojo Variant

The Bojo Variant consists of shallow, well drained, slowly permeable soils that formed in residuum derived from welded and nonwelded, siliceous ash-flow tuff. Bojo Variant soils are on side slopes of low foothills. Slopes are 15 to 30 percent. The mean annual precipitation is 6 to 10 inches, and the mean annual temperature is 47 to 49 degrees F.

Taxonomic class: Clayey, montmorillonitic, mesic, shallow Typic Haplargids

Typical pedon: Bojo Variant very cobbly loam, 15 to 30 percent slopes, in an area of Bojo Variant-Schamp-Trunk association where pebbles cover approximately
25 percent, cobbles 25 percent, and stones 5 percent of
the surface.

A—0 to 5 inches; pale brown (10YR 6/3) very cobbled
loam, dark brown (10YR 4/3) moist; moderate very
thin platy structure; slightly hard, very friable,
slightly sticky and slightly plastic; common very fine
and fine roots; many fine vesicular pores; 25
percent pebbles, 25 percent cobbles, 5 percent
stones; slightly effervescent; moderately alkaline
(pH 8.2); clear smooth boundary. (2 to 6 inches
thick)

Bt—5 to 9 inches; pale brown (10YR 6/3) very gravelly
loam, dark brown (10YR 4/3) moist; weak fine and
medium subangular blocky structure; slightly hard,
very friable, sticky and plastic; common very fine
and fine roots; common fine tubular pores; 35
percent pebbles, 5 percent cobbles; common thin
clay films on faces of peds and lining pores; slightly
effervescent; moderately alkaline (pH 8.2); clear
smooth boundary. (3 to 6 inches thick)

Btk—9 to 18 inches; pinkish gray (7.5YR 6/2) clay, dark
brown (7.5YR 4/2) moist; moderate fine prismatic
structure; hard, firm, sticky and plastic; few very fine
roots; few very fine tubular pores; 10 percent
pebbles, 2 percent cobbles; continuous, thin clay
films on faces of peds and lining pores; common
fine lime filaments; strongly effervescent;
moderately alkaline (pH 8.2); clear smooth
boundary. (6 to 10 inches thick)

Cr—18 inches; weathered tuff.

**Type location:** Pershing County, Nevada; in the Tobin
Range, about 1,200 feet east and 800 feet south of
the northwest corner of sec. 35, T. 29 N., R. 39 E.

**Range in Characteristics**

Soil moisture: Usually dry; intermittently moist in winter
and spring

Soil temperature: 48 to 53 degrees F

Depth to paralithic contact: 14 to 20 inches

Control section: Content of clay—35 to 50 percent;
content of rock fragments—15 to 35 percent

**Bt horizon:**

Texture—very gravelly loam or very gravelly clay
loam; commonly clay in the lower part

**Boton Series**

The Boton series consists of very deep, well drained,
moderately slowly permeable soils that formed in a thin
layer of loess and alluvium influenced by volcanic ash
and in the underlying lacustrine sediments. Boton soils
are on lake plain terraces. Slopes are 0 to 2 percent.

The mean annual precipitation is about 7 inches, and
the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic
Durothric Torriorthents

**Typical pedon:** Boton silt loam, 0 to 2 percent slopes,
in an area of Boton-Playas association:

A1—0 to 3 inches, light gray (10YR 7/2) silt loam,
grayish brown (10YR 5/2) moist; weak thin platy
structure; slightly hard, very friable, slightly sticky
and slightly plastic; few very fine roots; common
very fine and fine vesicular pores; violently
effervescent (less than 1 percent calcium carbonate
equivalent); strongly alkaline (pH 8.6); abrupt
smooth boundary. (2 to 6 inches thick)

A2—3 to 10 inches; grayish brown (10YR 7/2) silt loam,
grayish brown (10YR 5/2) moist; strong thin platy
structure; hard, very friable, slightly sticky and
slightly plastic; common very fine roots; many fine
and medium vesicular pores; violently effervescent
(less than 1 percent calcium carbonate equivalent);
strongly alkaline (pH 8.8); clear smooth boundary.
(4 to 14 inches thick)

Bq—10 to 12 inches; light gray (10YR 7/2) silt loam,
pale brown (10YR 6/3) moist; strong thin platy
structure; hard, friable, slightly sticky and plastic;
common very fine roots; common fine and medium
tubular pores; 20 percent durinodes; violently
effervescent (10 percent calcium carbonate
equivalent); strongly alkaline (pH 9.0); clear smooth
boundary. (0 to 6 inches thick)

2Bqk1—12 to 18 inches; light gray (2.5Y 7/2) silt loam
stratified with thin lenses of silty clay loam and very
fine sandy loam; light brownish gray (2.5Y 6/2)
moist; common fine manganese stains on faces of
peds and common fine distinct dark yellowish brown
(10YR 4/4) relict mottles; prominent thin platelike
bedding planes; slightly hard, very friable, sticky
and plastic; many very fine and common fine roots;
many fine tubular pores; 20 percent durinodes; few
fine lime filaments; violently effervescent (17
percent calcium carbonate equivalent); very strongly
alkaline (pH 9.2); abrupt smooth boundary. (5 to 12
inches thick)

2Bqk2—18 to 27 inches; light gray (2.5Y 7/2) silt loam
stratified with thin lenses of silty clay loam and very
fine sandy loam; light brownish gray (2.5Y 6/2)
moist; few fine manganese stains and many coarse
distinct dark brown (7.5YR 4/4) relict mottles;
massive; hard, friable, sticky and plastic; few very
fine roots; few fine tubular pores; 50 percent
durinodes; few fine lime filaments; violently
effervescent (22 percent calcium carbonate
equivalent); strongly alkaline (pH 8.8); clear smooth boundary. (6 to 15 inches thick)

2Bk—27 to 32 inches; light gray (2.5Y 7/2) silt loam stratified with thin lenses of silty clay loam and very
fine sandy loam; light brownish gray (2.5Y 6/2)
moist; few fine manganese stains on faces of peds
and many coarse distinct dark brown (7.5YR 4/4)
relict mottles; weak thin platelike bedding planes;
slightly hard, slightly friable, sticky and plastic; few
very fine roots; many fine tubular pores; few fine
tlime filaments; violently effervescent (20 percent
calcium carbonate equivalent); strongly alkaline (pH
8.8); clear smooth boundary. (4 to 18 inches thick)

2Bk—32 to 60 inches; light brownish gray (2.5Y 6/2)
silt loam stratified with thin lenses of silty clay loam
and very fine sandy loam; light brownish gray (2.5Y
6/2) moist; few fine manganese stains on faces of peds
and common fine distinct dark yellowish brown
(10YR 4/4) relict mottles; weak thin platelike
bedding planes; slightly hard, very friable, sticky
and plastic; few very fine roots; common fine tubular
pores; few fine and medium lime filaments; few fine
soft masses of gypsum; violently effervescent (20
percent calcium carbonate equivalent); strongly
alkaline (pH 8.8).

Type location: Pershing County, Nevada;
approximately 5 miles south of Jengo, in an
unsurveyed area about 13,000 feet east and 5,000
feet north of the southeast corner of sec. 1, T. 34
N., R. 31 E. (40 degrees, 50 minutes, 22 seconds
north latitude and 118 degrees, 25 minutes, 6
seconds west longitude).

Range in Characteristics

Soil moisture: Usually dry during the growing season;
moist for short periods in winter and spring, dry
from May through October

Soil temperature: 53 to 57 degrees F

Depth to lacustrine material: 10 to 20 inches

Depth to the Bq or Bq horizon: 8 to 20 inches

Control section: Content of clay—18 to 27 percent;
texture—averages silt loam that has common very
thin strata of silty clay loam and very fine sandy
loam

Reaction throughout the profile: Strongly alkaline or very
strongly alkaline

Relict iron mottles: Common or many, faint or distinct,
and fine to coarse in the lacustrine sediments

Other features: Subhorizons that commonly have thin or
very thin varves or lenses in the lacustrine
sediments

A horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3
Structure—platy or granular

Bq and 2Bqk horizons:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 5 or 6 moist

Structure—platelike bedding planes; massive in
some peds
Cementation—20 to 60 percent weakly or strongly
cemented durinodes in a friable matrix

Calcium carbonate equivalent—average of 5 to 20
percent

Salinity—moderate or strong

Exchangeable sodium—45 to 70 percent

Gypsum filaments—do not occur in subhorizons of
some peds

2Bk horizon:
Value—6 or 7 dry, 5 or 6 moist

Chroma—2 or 3

Structure—platelike bedding planes; massive in
some peds

Calcium carbonate equivalent—average of 5 to 20
percent

Salinity—strong

Exchangeable sodium—55 to 70 percent

Gypsum filaments—do not occur in subhorizons of
some peds

Bubus Series

The Bubus series consists of very deep, well drained,
moderately permeable soils that formed in alluvium and
lacustrine sediments derived from mixed rock sources
high in content of pyroclastic material. Bubus soils are
on alluvial flat remnants and lake plain terraces. Slopes
are 0 to 2 percent. The mean annual precipitation is
about 7 inches, and the mean annual temperature is
about 49 degrees F.

Taxonomic class: Coarse-loamy, mixed (calcareous),
mesic Durothidic Torrorthents

Typical pedon: Bubus very fine sandy loam, 0 to 2
percent slopes, in an area where pebbles cover
approximately 2 percent of the surface:

A—0 to 2 inches; pale brown (10YR 6/3) very fine
sandy loam, brown (10YR 4/3) moist; strong thick
platy structure parting to weak very thin platy; soft,
very friable, slightly sticky and slightly plastic; few
very fine roots; few very fine and fine vesicular
pores; strongly effervescent; moderately alkaline
(pH 8.4); abrupt smooth boundary. (2 to 10 inches
thick)

C1—2 to 6 inches; pale brown (10YR 6/3) very fine
sandy loam, brown (10YR 4/3) moist; strong thin
platy structure; soft, very friable, slightly sticky and
slightly plastic; common fine and few very fine roots; common very fine and few fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 11 inches thick)

C2—6 to 13 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine and few fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (5 to 13 inches thick)

Cq—13 to 26 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 2 percent fine pebbles; 30 percent durinodes; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (5 to 13 inches thick)

Cqk—26 to 37 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; few very fine tubular pores; 2 percent fine pebbles; 25 percent durinodes; violently effervescent; few fine lime filaments; moderately alkaline (pH 8.4); clear smooth boundary. (7 to 16 inches thick)

C’1—37 to 53 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine, fine, and coarse roots; few very fine and fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 20 inches thick)

C’2—53 to 60 inches; light gray (10YR 7/2) fine sandy loam, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6).

Type location: Pershing County, Nevada; approximately 2 miles west of Imlay, about 800 feet north and 300 feet east of the southwest corner of sec. 7, T. 32 N., R. 34 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 53 degrees F
Control section: Content of clay—10 to 15 percent; content of rock fragments—0 to 5 percent pebbles
Other features: Faint or distinct iron mottles and gypsum segregations commonly in horizons below a depth of 10 inches
Salt and sodium: Strongly salt and sodium affected throughout the profile in most pedons but only moderately or slightly affected in the upper horizons in some pedons

A horizon:
Value—6 or 7 dry, 4 or 5 moist
Chroma—2, 3, or 4
Structure—platy or granular
Consistence—nonsticky or slightly sticky and nonplastic or slightly plastic
Reaction—moderately alkaline to very strongly alkaline
Effervescence—slightly effervescent to violently effervescent

C horizon:
Value—6 or 7 dry, 4 to 6 moist
Chroma—2 to 4
Texture—loam, silt loam, very fine sandy loam, fine sandy loam, or sandy loam (dominantly very fine sandy loam)
Structure—platy; massive in some pedons
Reaction—moderately alkaline to very strongly alkaline, commonly decreasing in alkalinity with depth
Effervescence—strongly effervescent to violently effervescent

Cqk horizon:
Reaction—moderately alkaline to very strongly alkaline
Other features—20 to 70 percent durinodes

2C horizon (not in all pedons):
Texture—stratified sand and gravel below a depth of 40 inches

Burnborough Series

The Burnborough series consists of very deep, well drained, moderately permeable soils that formed in residuum and colluvium weathered dominantly from andesitic and rhyolitic rocks. Burnborough soils are on side slopes of mountains. Slopes are 15 to 75 percent. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F.

Taxonomic class: Loamy-skeletal, mixed, frigid Aridic Argixerolls

Typical pedon: Burnborough very gravelly loam, 50 to 75 percent slopes, in an area of Burrita-Burnborough association where pebbles cover approximately 50 percent and cobbles 5 percent of the surface:

A1—0 to 3 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; strong very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine and common medium vesicular pores; 35 percent pebbles, 2 percent
cobbles; neutral (pH 6.8); clear smooth boundary. (3 to 8 inches thick)
A2—3 to 7 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium roots; few very fine tubular pores; 35 percent pebbles; neutral (pH 6.8); clear smooth boundary. (3 to 8 inches thick)
Bt1—7 to 13 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, sticky and plastic; common very fine and fine and few medium roots; common very fine and few fine tubular pores; common thin clay films lining pores; 35 percent pebbles; neutral (pH 7.2); clear smooth boundary. (0 to 10 inches thick)
Bt2—13 to 23 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine and few medium roots; few very fine and fine tubular pores; 35 percent pebbles, 10 percent cobbles; common thin clay films on faces of pedis and lining pores; neutral (pH 7.2); clear smooth boundary. (8 to 16 inches thick)
Bt3—23 to 60 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, very friable, sticky and plastic; common very fine, fine, and medium and few coarse roots; few very fine tubular pores; 40 percent pebbles, 15 percent cobbles; continuous, thin clay films on faces of pedis and lining pores; neutral (pH 7.2).
Type location: Pershing County, Nevada; in the Fish Creek Mountains, near Jersey Valley, about 1,300 feet east and 900 feet north of the southwest corner of sec. 14, T. 27 N., R. 40 E.

Range in Characteristics
Soil moisture: Usually dry during the growing season; moist in winter and spring, dry in summer and fall; depth of wetting exceeding 30 inches in most years
Soil temperature: 42 to 46 degrees F
Depth to bedrock: 60 to 80 inches
Mollis epipedon: 10 to 20 inches thick; includes the Bt1 horizon
Reaction throughout the profile: Slightly acid or neutral
A horizon:
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3
Bt1 horizon:
Value—4 or 5 dry
Chroma—2 or 3
Texture—very gravelly sandy loam or very gravelly loam
Content of clay—18 to 25 percent
Content of rock fragments—35 to 50 percent, mainly pebbles
Bt2 and Bt3 horizons:
Value—5 or 6 dry, 3, 4, or 5 moist
Chroma—3 or 4 dry
Texture—very gravelly loam or very gravelly clay loam
Content of clay—18 to 35 percent
Content of rock fragments—35 to 60 percent, mainly pebbles
C horizon (not in pedons):
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 to 6
Texture—loam to loamy sand
Content of rock fragments—35 to 75 percent, mainly pebbles

Burrita Series

The Burrita series consists of shallow, well drained, slowly permeable soils that formed in residuum and colluvium derived from metamorphic and volcanic rocks. Burrita soils are on crests and side slopes of mountains and hills. Slopes are 4 to 75 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Clayey-skeletal, montmorillonitic, mesic Lithic Xerolic Hapludands

Typical pedon: Burrita very cobbly loam, 30 to 50 percent slopes, in an area of Hoot-Burrita-Bojo association where pebbles cover approximately 25 percent, cobbles 15 percent, and stones 5 percent of the surface:
A1—0 to 2 inches; light brownish gray (10YR 6/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; strong very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 15 percent pebbles, 15 percent cobbles, 5 percent stones; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 5 inches thick)
A2—2 to 4 inches; light brownish gray (10YR 6/2) loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 7 inches thick)
BA—4 to 8 inches; pale brown (10YR 6/3) gravelly
loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine and few fine roots; common fine tubular pores; 20 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.4); gradual smooth boundary. (0 to 4 inches thick)

Bt—8 to 17 inches; dark brown (7.5YR 4/4) very gravelly clay, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; common very fine and fine roots; few fine tubular pores; 45 percent pebbles, 5 percent cobbles; many thin clay films on faces of pedds and lining pores; slightly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (7 to 14 inches thick)

2R—17 inches; unweathered andesite; thin lime coatings on the surface of the bedrock.

Type location: Pershing County, Nevada; in the southern part of the Tobin Range, about 2,300 feet west and 700 feet south of the northeast corner of sec. 3, T. 26 N., R. 39 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 50 degrees F
Depth to bedrock: 14 to 20 inches
Control section: Content of clay—35 to 50 percent; content of rock fragments—35 to 60 percent, when mixed, mainly pebbles, cobbles, or stones
Reaction throughout the profile: Moderately alkaline or strongly alkaline

A horizon:
  Value—5 to 7 dry, 3 to 5 moist
  Chroma—2, 3, or 4
  Consistence—soft or slightly hard

Bt horizon:
  Hue—10YR or 7.5YR
  Value—4 to 6 dry, 3 or 4 moist
  Chroma—3 to 6
  Texture—very gravelly clay, very cobbly clay, very stony clay, very gravelly clay loam, very cobbly clay loam, or very stony clay loam
  Structure—subangular or angular blocky

Chen Series

The Chen series consists of shallow, well drained, very slowly permeable soils that formed in residuum and colluvium weathered from rhyolite, andesite, or tuff and influenced by loess high in content of volcanic ash. Chen soils are on crests and side slopes of plateaus and buttes. Slopes are 4 to 15 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F.

Taxonomic class: Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls

Typical pedon: Chen very stony loam, 4 to 15 percent slopes, in an area of Alyan-Chen-Rock outcrop association where stones cover 5 percent, cobbles 10 percent, and pebbles 15 percent of the surface:

A1—0 to 2 inches; grayish brown (10YR 5/2) very stony loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common fine vesicular pores; 10 percent pebbles, 10 percent cobbles, 5 percent stones; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 6 inches thick)

A2—2 to 10 inches; brown (10YR 5/3) stony loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; 10 percent stones, 5 percent pebbles, 1 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 8 inches thick)

Bt1—10 to 15 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; common brown (10YR 5/3) stains on faces of pedds, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; 35 percent pebbles, 10 percent cobbles; continuous pressure faces on pedds; neutral (pH 6.8); clear smooth boundary. (0 to 5 inches thick)

Bt2—15 to 19 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; common very fine and fine roots; common very fine tubular pores; continuous pressure faces on pedds; 40 percent pebbles, 10 percent cobbles; neutral (pH 7.0); abrupt smooth boundary. (4 to 7 inches thick)

2R—19 inches; unweathered andesite.

Type location: Pershing County, Nevada; approximately 32 miles south of Winnemucca, in the East Range, about 1,585 feet east and 1,848 feet north of the southwest corner of sec. 5, T. 30 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 43 to 47 degrees
Mollic epipedon: 7 to 15 inches thick; generally includes the upper part of the argilllic horizon

Depth to bedrock: 12 to 20 inches

Reaction throughout the profile: Slightly acid to mildly alkaline

A horizon:
  Value—4 to 6 dry (less than 5.5 when the uppermost 7 inches is mixed), 2 or 3 moist
  Chroma—2 or 3
  Structure—weak or moderate, medium or thin platy or very fine to medium, granular or subangular blocky

Bt horizon:
  Hue—7.5YR or 10YR; 5YR commonly in areas where high iron concentrations are in the parent material
  Value—4 or 5 dry, 3 or 4 moist
  Chroma—2 to 4
  Texture—very gravelly clay, extremely gravelly clay, very cobbly clay, or extremely cobbly clay; in some pedons a thin Bt horizon of very gravelly clay loam that has 35 to 40 percent clay
  Content of clay—40 to 55 percent
  Content of rock fragments—40 to 65 percent pebbles and cobbles, generally increasing in amount with depth
  Structure—weak to strong, fine or medium, angular or subangular blocky or platy

Chiara Series

The Chiara series consists of shallow, well drained, moderately permeable soils that formed in alluvium derived from mixed rock sources and in a mantle of loess high in content of volcanic ash. Chiara soils are on fan piedmont remnants. Slopes are 2 to 30 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Loamy, mixed, mesic, shallow Xerollic Durothids

Typical pedon: Chiara fine sandy loam, 2 to 8 percent slopes, in an area of Bliss-Chiara association:

A1—0 to 2 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; many very fine vesicular pores; neutral (pH 7.0); clear smooth boundary. (2 to 3 inches thick)

A2—2 to 4 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; many very fine tubular pores; neutral (pH 7.0); clear smooth boundary. (1 to 5 inches thick)

Bw—4 to 10 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few medium roots; common very fine tubular pores; mildly alkaline (pH 7.4); clear smooth boundary. (4 to 7 inches thick)

Bqk—10 to 15 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive; hard, firm, slightly sticky and slightly plastic; common fine and very fine roots; few very fine tubular pores; 20 percent durinodes; slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary. (5 to 10 inches thick)

2Bqkm—15 to 21 inches; light gray (10YR 7/2), indurated duripan, pale brown (10YR 6/3) moist; massive; extremely hard, extremely firm; violently effervescent; moderately alkaline (pH 8.4).

Type location: Pershing County, Nevada; approximately 5 miles east of Mill City, near Dun Glen Canyon, about 2,000 feet south and 1,000 feet west of the northeast corner of sec. 17, T. 33 N., R. 36 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring

Soil temperature: 47 to 53 degrees F

Control section: Content of clay—5 to 18 percent; texture—very fine sandy loam, loam, or silt loam having 70 to 85 percent silt and very fine sand; content of rock fragments—when mixed, as much as 5 percent, mainly pebbles, but 4 to 25 percent, mainly duripan fragments, in thin subhorizons in some pedons

Depth to a duripan: 10 to 20 inches

Depth to lime: 7 to 15 inches

Other features: A stratified gravelly and sandy substratum below a depth of 40 inches in some pedons

A horizon:
  Value—3 or 4 moist
  Chroma—2 or 3
  Structure—weak or moderate, thin to thick, platy or granular
  Reaction—neutral to moderately alkaline

Bw horizon:
  Value—6 or 7 dry, 3 to 5 moist
  Chroma—3 or 4
  Structure—weak to strong, fine to coarse subangular blocky or weak prismatic
  Reaction—mildly alkaline to strongly alkaline
Bqk horizon:
  Reaction—moderately alkaline or strongly alkaline
  Cementation—20 to 60 percent weakly cemented
    and brittle durinodes 0.3 to 1.0 inch in diameter

Bqkm horizon:
  Value—6 to 8 dry, 5 to 7 moist
  Chroma—2 to 4
  Structure—massive or weak or moderate thick platy

Chilper Series

The Chilper series consists of very deep, well
  drained, very slowly permeable soils that formed in
  loess over alluvium derived from mixed rock sources.
  Chilper soils are on side slopes of fan piedmont
  remnants. Slopes are 2 to 50 percent. The mean annual
  precipitation is about 5 inches, and the mean annual
  temperature is about 52 degrees F.

T axonomic class: Fine, montmorillonitic, mesic Duric
  Natrargids

Typical pedon: Chilper cobbly very fine sandy loam, 2
  to 8 percent slopes, in an area of Chilper-Trocken-
  Jerval association where pebbles cover approximately
  10 percent and cobbles 7 percent of the surface:
  A1—0 to 3 inches; light gray (10YR 7/2) cobbly very
  fine sandy loam, grayish brown (10YR 5/2) moist;
  moderate thick platy structure; slightly hard, very
  friable, nonsticky and slightly plastic; many very fine
  and few fine roots; many fine and medium vesicular
  pores; 10 percent pebbles, 7 percent cobbles;
  strongly effervescent; moderately alkaline (pH 8.4);
  clear smooth boundary. (1 to 3 inches thick)
  A2—3 to 7 inches; very pale brown (10YR 7/3) very fine
  sandy loam, brown (10YR 5/3) moist; moderate thin
  platy structure; slightly hard, very friable, nonsticky
  and slightly plastic; common very fine roots; many
  very fine and fine tubular pores; 2 percent pebbles;
  strongly effervescent; moderately alkaline (pH 8.4);
  clear smooth boundary. (0 to 4 inches thick)
  AB—7 to 13 inches; pale brown (10YR 6/3) very fine
  sandy loam, brown (10YR 5/3) moist; weak medium
  subangular blocky structure; slightly hard, very
  friable, slightly sticky and slightly plastic; few very
  fine to medium roots; many very fine and fine
  tubular pores; 2 percent pebbles; slightly
  effervescent; moderately alkaline (pH 8.4); abrupt
  smooth boundary. (0 to 5 inches thick)
  Btkn—13 to 22 inches; light brown (7.5YR 6/4) clay
  loam, dark brown (7.5YR 4/4) moist; strong fine
  prismatic structure; hard, firm, sticky and plastic;
  common very fine and fine roots; few very fine
  tubular pores; 5 percent pebbles; many thin clay
  films on faces of peds and lining pores; common
  fine lime filaments; strongly effervescent; strongly
  alkaline (pH 8.8); clear smooth boundary. (5 to 12
  inches thick)
  Btnc—22 to 29 inches; light brown (7.5YR 6/4) clay
  loam, dark brown (7.5YR 4/4) moist; strong fine
  prismatic structure; hard, firm, very sticky and very
  plastic; few very fine and fine roots; few very fine
  tubular pores; 10 percent pebbles; many thin clay
  films on faces of peds and lining pores; many fine
  lime and gypsum seams; strongly effervescent;
  strongly alkaline (pH 9.0); clear smooth boundary.
  (3 to 12 inches thick)
  Bqk—29 to 60 inches; light yellowish brown (10YR 6/4)
  extremely gravelly sandy loam, dark yellowish
  brown (10YR 4/4) moist; massive; hard, firm,
  slightly sticky and nonplastic; few very fine roots;
  few very fine tubular pores; 70 percent pebbles, 2
  percent cobbles; weak, continuous silica and lime
  cementation; violently effervescent; strongly alkaline
  (pH 9.0).

T ype location: Pershing County, Nevada;
  approximately 20 miles southeast of Lovelock, near
  Buena Vista Hill, about 1,900 feet east and 800 feet
  north of the southwest corner of sec. 23, T. 25 N.,
  R. 34 E.

R ange in Characteristics

Soil moisture: Usually dry; moist for short periods in
  winter and early spring

Soil temperature: 53 to 59 degrees F

Depth to a weakly cemented horizon and the base of the
  argillic horizon: 20 to 35 inches

Control section: Content of clay—35 to 50 percent;
  content of rock fragments—0 to 15 percent, mainly
  pebbles; exchangeable sodium—35 to 60 percent

Reaction throughout the profile: Moderately alkaline or
  strongly alkaline

A horizon:
  Value—6 or 7 dry, 4 or 5 moist
  Chroma—2 or 3
  Other features—noneffervescent in some pedons

Bkn horizon:
  Hue—10YR or 7.5YR
  Value—5 or 6 dry, 4 or 5 moist
  Chroma—3 to 6
  Texture—clay loam or clay
  Other features—a strongly effervescent matrix;
    segregated lime throughout and gypsum in the
    lower subhorizons

Bqk horizon:
  Value—5, 6, or 7 dry, 4, 5, or 6 moist
  Chroma—3 or 4
  Content of rock fragments—60 to 80 percent
Cementation—weak, continuous lime and silica cementation with a minimum thickness of 6 inches in at least one subhorizon within a depth of 40 inches.

**Chumall Series**

The Chumall series consists of very deep, moderately well drained, moderately slowly permeable soils that formed in lacustrine deposits derived from mixed sources. Chumall soils are on beach plain lagoons. Slopes are 0 to 2 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 52 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Chumall silt loam, 0 to 2 percent slopes, in an area of Mazuma-Toulon-Chumall association:

A1—0 to 2 inches; light gray (10YR 7/2) silt loam, grayish brown (2.5Y 5/2) moist; strong thin platy structure; very hard, friable, sticky and plastic; few very fine roots; many very fine and fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 5 inches thick)

A2—2 to 7 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; strong thin platy structure; hard, friable, sticky and plastic; few very fine roots; many very fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 6 inches thick)

Bw—7 to 14 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak fine prismatic structure parting to moderate thin platy; hard, friable, sticky and plastic; common very fine and fine roots; many very fine tubular pores; very thin silica coatings on faces of ped; violently effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (6 to 18 inches thick)

2C1—14 to 23 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; few fine distinct relict mottles, brown (7.5YR 4/4) moist; moderate thin platy bedding planes; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and fine tubular pores; few fine rounded relict soft lime masses embedded in plates; violently effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (6 to 20 inches thick)

2C2—23 to 60 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; few fine distinct relict mottles, brown (7.5YR 4/4) moist; common relict manganese stains; moderate thin platy bedding planes; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; few fine gypsum crystals; violently effervescent; strongly alkaline (pH 9.0).

**Type location:** Pershing County, Nevada; along the northern part of the Carson Sink, about 700 feet west and 400 feet north of the southeast corner of sec. 3, T. 25 N., R. 33 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods in winter and spring

**Soil temperature:** 53 to 57 degrees F

**Depth to lacustrine deposits:** 10 to 20 inches

**Control section:** Content of clay—18 to 27 percent; reaction—moderately alkaline to very strongly alkaline, becoming more alkaline with depth

**Other features:** Relict mottles or manganese stains

**Exchangeable sodium:** More than 50 percent in the Bw and C horizons

**A horizon:**
- Hue—10YR or 2.5Y
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3
- Reaction—moderately alkaline or strongly alkaline

**Bw horizon:**
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry, 3, 4, or 5 moist
- Chroma—3 or 4
- Consistency—very hard or hard, friable or firm (but not both hard and firm)
- Reaction—strongly alkaline or very strongly alkaline

**2C horizon:**
- Hue—10YR, 2.5Y, or 5Y
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3
- Texture—dominantly silt loam that has thin strata of silty clay loam
- Structure—platy bedding planes; massive in some pedons
- Reaction—strongly alkaline or very strongly alkaline

Segregated lime—a few relict soft masses of lime commonly in any part of the horizon

**Other features:** Silty clay below a depth of 40 inches in some pedons; a substratum of fine sand in other pedons

**Cleavage Series**

The Cleavage series consists of shallow, well drained, moderately slowly permeable soils that formed in residuum or colluvium derived from rhyolitic flow and
other igneous rocks. Cleavage soils are on crests and shoulders of mountains. Slopes are 4 to 50 percent. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 44 degrees F.

**Taxonomic class**: Loamy-skeletal, mixed, frigid Lithic Argixerols

**Typical pedon**: Cleavage very gravelly loam, 4 to 15 percent slopes, in an area of Burnborough-Cleavage-Reluctan association where pebbles cover approximately 15 percent and cobbles 5 percent of the surface:

A1—0 to 6 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine vesicular pores; 40 percent pebbles, 5 percent cobbles, 1 percent stones; neutral (pH 7.2); clear smooth boundary. (1 to 9 inches thick)

A2—6 to 10 inches; grayish brown (10YR 5/2) very gravelly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; common very fine tubular pores; 35 percent pebbles; neutral (pH 7.2); clear smooth boundary. (0 to 8 inches thick)

BA—10 to 14 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 3/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 40 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (0 to 6 inches thick)

Bt—14 to 17 inches; light yellowish brown (10YR 6/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; few very fine tubular pores; common thin clay films on faces of ped and lining pores; 25 percent pebbles, 25 percent cobbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (4 to 12 inches thick)

2R—17 inches; unweathered rhyolite.

**Type location**: Pershing County, Nevada; in the Augusta Mountains, near Dixie Valley, about 1,600 feet north and 1,800 feet west of the southeast corner of sec. 24, T. 25 N., R. 39 E.

**Range in Characteristics**

**Soil moisture**: Usually dry; moist in winter and spring

**Soil temperature**: 44 to 47 degrees F

**Mollis epipedon**: 7 to 10 inches thick; does not include the Bt horizon

**Depth to bedrock**: 14 to 20 inches

**Control section**: Content of clay—20 to 35 percent; content of rock fragments—50 to 80 percent, mostly pebbles or cobbles

**Reaction throughout the profile**: Neutral or mildly alkaline

**A horizon**:
- Value—4 or 5 dry, 2 or 3 moist
- Chroma—2 or 3
- Structure—platy, granular, or subangular blocky

**BA horizon**:
- Chroma—2 to 4
- Texture—very cobbly loam or very gravelly loam

**Bt horizon**:
- Hue—7.5YR or 10YR
- Value—5 or 6 dry, 3 or 4 moist
- Chroma—3 or 4
- Texture—very cobbly, extremely cobbly, very gravelly, or extremely gravelly clay loam; very gravelly sandy clay loam; very cobbly or very gravelly loam in some pedons
- Structure—subangular or angular blocky

**Cleaver Series**

The Cleaver series consists of shallow, well drained, slowly permeable soils that formed in alluvium derived primarily from basic igneous rocks. Cleaver soils are on fan piedmont remnants. Slopes are 2 to 4 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 51 degrees F.

**Taxonomic class**: Loamy, mixed, mesic, shallow Typic Durargids

**Typical pedon**: Cleaver gravelly loam, 2 to 4 percent slopes, in an area of Cleaver-Trocken-Bluewing association where pebbles cover approximately 15.0 percent, cobbles 2.0 percent, and stones 0.1 percent of the surface:

A—0 to 5 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; strong thick platy structure parting to weak very thin platy; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium and coarse roots; many very fine and common fine and medium vesicular and common very fine tubular pores; 15 percent pebbles, 1 percent cobbles; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (2 to 8 inches thick)

Bt1—5 to 11 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky
structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; many very fine tubular pores; 15 percent pebbles; common thin clay films on faces of peds and lining pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 10 inches thick)

Bt2—11 to 17 inches; very pale brown (10YR 7/3) gravelly loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; soft, very friable, sticky and plastic; many very fine and common fine roots; many very fine tubular pores; 25 percent pebbles; few thin clay films on faces of peds and lining pores; slightly effervescent; strongly alkaline (pH 8.4); abrupt smooth boundary. (0 to 8 inches thick)

Bqkm—17 to 24 inches; white (10YR 8/2), indurated duripan, very pale brown (10YR 7/3) moist; few very fine and fine roots in fractures; a layer of pebbles in the lower part; violently effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (6 to 24 inches thick)

Cqk—24 to 51 inches; very pale brown (10YR 7/3) extremely gravelly coarse sandy loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine tubular pores; 55 percent pebbles, 15 percent cobbles; weak silica cementation; violently effervescent; lime coatings on the underside of rock fragments; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 27 inches thick)

Ck—51 to 60 inches; very pale brown (10YR 7/3) extremely gravelly coarse sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; 55 percent pebbles, 15 percent cobbles; violently effervescent; lime coatings on all sides of rock fragments; strongly alkaline (pH 9.0).

Type location: Pershing County, Nevada; in Dixie Valley, about 600 feet south and 1,200 feet west of the northeast corner of sec. 29, T. 25 N., R. 39 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and early spring

Soil temperature: 54 to 57 degrees F

Depth to an indurated duripan: 10 to 20 inches

A horizon:

Carbonates—commonly calcareous in the uppermost few inches as a result of recharge from dust

Other features—a varnished desert pavement in some pedons

Bt horizon:

Hue—7.5YR or 10YR

Value—5, 6, or 7 dry, 3, 4, or 5 moist

Chroma—3 to 5

Texture—gravelly loam or gravelly clay loam; subhorizons of gravelly clay in some pedons

Content of clay—25 to 35 percent

Content of rock fragments—15 to 35 percent

Reaction—neutral to moderately alkaline

Other features—in some pedons a transitional Bt horizon of sandy loam, fine sandy loam, loam, or clay loam that has few or no pebbles in the upper part or that has 15 to 40 percent pebbles and cobbles in the lower part

Colbar Series

The Colbar series consists of moderately deep, well drained, moderately slowly permeable soils that formed in residuum and colluvium derived from rhyolitic and andesitic rocks. Colbar soils are on foothills. Slopes are 30 to 50 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Fine-loamy, mixed, mesic Xerolic Haplargids

Typical pedon: Colbar very cobbly loam, 30 to 50 percent slopes, in an area of Laped-Colbar association where pebbles cover approximately 20 percent, cobbles 30 percent, and stones 5 percent of the surface:

A1—0 to 1 inch; pale brown (10YR 6/3) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common fine vesicular and tubular pores; 10 percent pebbles, 30 percent cobbles, 5 percent stones; moderately alkaline (pH 8.0); clear smooth boundary. (1 to 4 inches thick)

A2—1 to 6 inches; light brownish gray (10YR 6/2) cobbly loam, dark grayish brown (10YR 4/2) moist; strong very thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine and fine pores; 10 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 5 inches thick)

Bt—6 to 13 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; few fine and very fine tubular pores; 15 percent pebbles, 5 percent cobbles; common thin clay films on faces of peds and lining pores; moderately alkaline (pH
8.2); clear smooth boundary. (3 to 14 inches thick)
Btk—13 to 24 inches; very pale brown (10YR 7/3)
cobby loam, dark yellowish brown (10YR 4/4)
moist; moderate medium subangular blocky
structure; hard, friable, slightly sticky and slightly
plastic; few very fine and fine roots; few fine and
very fine tubular pores; 15 percent pebbles; 10
percent cobbles; thin lime coatings on the underside
of rock fragments; moderately alkaline (pH 8.4);
abrupt smooth boundary. (0 to 12 inches thick)
2R—24 inches; weathered rhyolite.
Type location: Pershing County, Nevada; in the Fish
Creek Mountains, near Jersey Valley, about 500
feet west and 1,800 feet north of the southeast
corner of sec. 4, T. 26 N., R. 40 E.

Range in Characteristics

Soil moisture: Usually dry; moist in late winter and
spring

Soil temperature: 48 to 52 degrees F

Control section: Content of clay—25 to 35 percent;
content of rock fragments—15 to 35 percent, mainly
pebbles and cobbles

Depth to bedrock: 20 to 40 inches

Combined thickness of the A and Bt horizons: 11 to 24
inches

Other features: A Bk horizon that has thin lime coatings
on the underside of rock fragments below the Bt
horizon in some pedons

A horizon:
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3
Structure—weak or moderate, very fine to medium,
subangular blocky or platy
Reaction—mildly alkaline or moderately alkaline

Bt horizon:
Value—5 or 6 dry, 3, 4, or 5 moist
Chroma—3 or 4
Structure—weak to strong, very fine to medium
subangular blocky
Texture—cobby loam, cobby clay loam, or gravelly
clay loam
Reaction—mildly alkaline or moderately alkaline

C or Bk horizon (not in all pedons):
Value—5, 6, or 7 dry, 4 or 5 moist
Chroma—3 or 4
Texture—gravelly loam or cobby loam

Cortez Series

The Cortez series consists of moderately deep, well
drained, very slowly permeable soils that formed in thin
loess deposits over mixed alluvium. Cortez soils are on
fan piedmonts and mountain valley fans. Slopes are 2
to 8 percent. The mean annual precipitation is about 9
inches, and the mean annual temperature is about 46
degrees F.

Taxonomic class: Fine, montmorillonitic, mesic Xerolic
Nadurargids

Typical pedon: Cortez very fine sandy loam, 2 to 8
percent slopes, in an area where pebbles cover
approximately 5 percent of the surface:

A1—0 to 3 inches; light brownish gray (10YR 6/2) very
fine sandy loam, dark grayish brown (10YR 4/2)
moist; moderate thin platy structure; slightly hard,
very friable, slightly sticky and slightly plastic; many
very fine and few fine roots; many fine vesicular
pores; 5 percent pebbles; moderately alkaline (pH 8.2);
abrupt smooth boundary. (1 to 6 inches thick)

A2—3 to 8 inches; light brownish gray (10YR 6/2) very
fine sandy loam, dark brown (10YR 3/3) moist;
moderate thin platy structure; slightly hard, very
friable, slightly sticky and slightly plastic; many very
fine and fine roots; many very fine to tubular pores; 5
percent pebbles; moderately alkaline (pH 8.4);
abrupt smooth boundary. (2 to 8 inches thick)

Btk—8 to 14 inches; yellowish brown (10YR 5/4) clay,
dark brown (10YR 4/3) moist; strong medium
columnar structure; very hard, very firm, very sticky
and very plastic; many very fine and fine roots; few
very fine tubular pores; 10 percent pebbles;
continuous, thin clay films on faces of pecks;
mildly alkaline (pH 8.4); clear smooth
boundary. (3 to 15 inches thick)

Btkn—14 to 27 inches; yellowish brown (10YR 5/4)
clay, dark brown (10YR 4/3) moist; strong medium
prismatic structure; very hard, very firm, very sticky
and very plastic; common very fine and fine roots;
few very fine tubular pores; 10 percent pebbles;
continuous, thin clay films on faces of pecks; a
slightly effervescent matrix with common lime
coatings on pecks; moderately alkaline (pH 8.4);
clear smooth boundary. (2 to 20 inches thick)

Btkn—27 to 33 inches; light yellowish brown (10YR
6/4) clay, brown (10YR 5/3) moist; moderate
medium subangular blocky structure; very hard,
very firm, very sticky and very plastic; few very fine
and fine roots; few very fine tubular pores; 10
percent pebbles; many thin clay films on faces of
pecks; strongly effervescent; many fine lime
filaments; strongly alkaline (pH 8.6); abrupt smooth
boundary. (0 to 6 inches thick)

Bqkn—33 to 46 inches; very pale brown (10YR 8/3),
indurated duripan, yellowish brown (10YR 5/4)
moist; massive; extremely hard, extremely firm;
strongly effervescent; strongly alkaline (pH 8.6);
a abrupt smooth boundary. (13 to 35 inches thick)
2C—46 to 60 inches; pale brown (10YR 6/3) very
cobbly coarse sandy loam, brown (10YR 4/3) moist;
massive; slightly hard, very friable, nonsticky and
nonplastic; many very fine interstitial pores; 25
percent pebbles, 30 percent cobbles; strongly
alkaline (pH 8.5).

Type location: Pershing County, Nevada;
approximately 28 miles south of Winnemucca, in
Grass Valley, about 1,200 feet south and 300 feet
east of the northwest corner of sec. 28, T. 31 N., R.
37 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 50 degrees F
Control section: Content of clay—40 to 50 percent,
when mixed; content of rock fragments—10 to 15
percent
Depth to an indurated duripan: 22 to 36 inches
Other features: An abrupt textural boundary between the
A or BA horizon and the Bt horizon

A horizon:
Value—5 to 7 dry (more than 5.5 when the
uppermost 7 inches is mixed), 3 or 4 moist
Chroma—2 or 3
Structure—moderate or strong, very thin to thick
platy; granular in some pedons
Reaction—neutral to moderately alkaline

Bt and Btk horizon:
Hue—10YR or 7.5YR
Value—5 or 6 dry, 3 to 5 moist
Chroma—2 to 4
Texture—clay, gravelly clay, or silt clay; thin
subhorizons of clay loam in some pedons
Structure—dominantly moderate or strong, medium
or coarse, prismatic or columnar but subangular
or angular blocky or massive in the lower part of
the Btk horizon in some pedons
Reaction—mildly alkaline to strongly alkaline
Carbonates—common or many fine or medium lime
filaments and seams in the lower part

Btkm horizon:
Value—6 to 8 dry, 4 to 7 moist
Chroma—1 to 4
Reaction—strongly alkaline or very strongly alkaline
Thickness—8 to more than 30 inches

C horizon (not in all pedons):
Texture—very gravelly coarse sandy loam or very
cobbly loamy coarse sand
Other features—moderately alkaline or strongly
saline-alkaline

Daick Series

The Daick series consists of very shallow or shallow,
well drained, slowly permeable soils that formed in
residuum derived from tuffaceous rocks. Daick soils are
on low hills and mountains. Slopes are 30 to 50
percent. The mean annual precipitation is about 7
inches, and the mean annual temperature is about 48
degrees F.

Taxonomic class: Clayey, montmorillonitic
(calcareous), mesic, shallow Typic Torriorthents

Typical pedon: Daick stony clay loam, 30 to 50 percent
slopes, in an area of Tenabo-Daick-Oxcorel association
where pebbles cover approximately 20 percent, cobbles
5 percent, and stones 3 percent of the surface:
A—0 to 1 inch; pale yellow (5Y 7/3) stony clay loam,
olive (5Y 5/4) moist; weak very thin platy structure;
slightly hard, very friable, sticky and plastic; many
very fine roots; many very fine and fine and few
medium vesicular pores; 10 percent pebbles, 2
percent cobbles, 3 percent stones; strongly
effervescent; moderately alkaline (pH 8.4); abrupt
smooth boundary. (1 to 3 inches thick)

C—1 to 4 inches; olive (5Y 5/4) clay, olive (5Y 5/4)
moist; massive; hard, firm, very sticky and very
plastic; many very fine and few fine roots; many
very fine and few fine tubular pores; 2 percent
pebbles; strongly effervescent; moderately alkaline
(pH 8.4); clear wavy boundary. (3 to 12 inches
thick)

Cr—4 inches; pale olive (5Y 6/4), strongly calcareous
bedrock, olive (5Y 5/4) moist.

Type location: Pershing County, Nevada; in Jersey
Valley, approximately 5 miles south of Needle Peak,
about 2,500 feet south and 1,400 feet west of the
northeast corner of sec. 4, T. 27 N., R. 40 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 48 to 53 degrees F
Depth to paralithic contact: 4 to 14 inches
Control section: Content of clay—35 to 60 percent;
texture—clay or clay loam; content of rock
fragments—0 to 25 percent, mainly pebbles
Reaction throughout the profile: Moderately alkaline or
strongly alkaline

Exchangeable sodium: As much as 15 percent
A horizon:
Hue—2.5Y or 5Y
Value—5 to 7 dry, 4 or 5 moist
Chroma—3 to 6 dry
Structure—platy or subangular blocky
Consistence—soft or slightly hard
**C horizon:**
- Hue—2.5Y or 5Y dry or moist
- Value—4 or 5 moist

**Dekoom Series**

The Dekoom series consists of very deep, well drained, moderately permeable soils that formed in residuum and colluvium weathered from limestone, dolostone, and calcareous shale. Dekoom soils are on side slopes of mountains. Slopes are 50 to 75 percent. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic Cryic Rendolls

**Typical pedon:** Dekoom very gravelly loam, 50 to 75 percent slopes, in an area of Polum-Dekoom-Polum Variant association:

**A1**—0 to 3 inches; brown (10YR 4/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; few very fine vesicular pores; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 5 inches thick)

**A2**—3 to 13 inches; brown (10YR 4/3) gravelly silt loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine, medium, and coarse roots; common very fine tubular pores; 30 percent pebbles; thin lime coatings on the underside of pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (5 to 10 inches thick)

**Bk1**—13 to 21 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine and medium roots; few very fine tubular pores; 50 percent pebbles; few fine soft masses of lime and thin lime coatings on all sides of pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 10 inches thick)

**Bk2**—21 to 37 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; few very fine tubular pores; 55 percent pebbles; common medium filaments and soft masses of lime and thin lime coatings on all sides of pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (10 to 16 inches thick)

**C**—37 to 60 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 70 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Pershing County, Nevada; near Star Peak, approximately 10 miles south of Imlay, about 1,600 feet south and 900 feet west of the northeast corner of sec. 29, T. 31 N., R. 34 E.

**Range in Characteristics**

**Soil moisture:** Usually moist; moist from late fall through early summer, dry from late July through September

**Soil temperature:** 42 to 47 degrees F

**Average soil temperature in summer:** 54 to 59 degrees F

**Mollic epipedon:** 10 to 15 inches thick; does not include the Bk horizon

**Combined thickness of the A and Bk horizons:** 20 to 40 inches

**Control section:** Content of clay—10 to 18 percent; content of rock fragments—40 to 60 percent, mainly pebbles; carbonate equivalent—40 to 60 percent; reaction—moderately alkaline or strongly alkaline

**A horizon:**
- Value—4 or 5 dry
- Chroma—2 or 3
- Structure—platy or granular

**Bk horizon:**
- Value—4, 5, or 6 dry, 3 or 4 moist
- Chroma—3 or 4
- Texture—very gravelly loam or very gravelly silt loam
- Content of clay—10 to 15 percent
- Content of rock fragments—35 to 60 percent, mainly pebbles

**C horizon:**
- Value—4, 5, or 6 dry, 4 or 5 moist
- Chroma—3 or 4
- Content of rock fragments—50 to 75 percent, mainly pebbles

**Denay Series**

The Denay series consists of deep, well drained, moderately permeable soils that formed in colluvium weathered from limestone and calcareous shale. Denay soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Aridic Calcixerolls
Typical pedon: Denay gravelly loam, 30 to 50 percent slopes, in an area of Denay-Wereld-Xine association:
A1—0 to 2 inches; brown (10YR 5/3) gravelly loam, very dark gray (10YR 3/1) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine and few fine vesicular pores; 20 percent pebbles; slightly effervescent; mildly alkaline (pH 7.8); clear smooth boundary. (1 to 4 inches thick)
A2—2 to 10 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; common very fine and few fine tubular pores; 30 percent pebbles; slightly effervescent; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 8 inches thick)
Bw—10 to 24 inches; brown (10YR 5/3) extremely gravelly silt loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; few very fine tubular pores; 60 percent pebbles; strongly effervescent; few fine soft masses of lime and thin lime coatings on the underside of pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (8 to 14 inches thick)
Bk—24 to 41 inches; light gray (10YR 7/2) extremely gravelly loam, pale brown (10YR 6/3) moist; massive; hard, firm, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; 80 percent pebbles; violently effervescent; lime coatings on all sides of pebbles; mildly alkaline (pH 7.8); clear wavy boundary. (6 to 17 inches thick)
C—41 to 44 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 60 percent pebbles; strongly effervescent; mildly alkaline (pH 7.8); abrupt wavy boundary. (0 to 20 inches thick)
2R—44 inches; unweathered limestone.

Type location: Pershing County, Nevada; in the northern part of the Humboldt Range, about 700 feet south and 1,800 feet east of the northwest corner of sec. 27, T. 31 N., R. 34 E.

Range in Characteristics
Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 45 to 47 degrees F
Mollific epipedon: 10 to 20 inches thick
Depth to the Bk horizon: 15 to 24 inches
Depth to bedrock: 40 to 60 inches

Control section: Content of clay—10 to 15 percent; texture—extremely gravelly loam or extremely gravelly silt loam; content of rock fragments—60 to 75 percent, mainly pebbles

Other features: Effervescence throughout the profile, except for the uppermost 2 to 3 inches of some pedons

A horizon:
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 or 2
Structure—weak or moderate, fine or medium, subangular blocky or granular or weak medium or coarse prismatic

Bw horizon:
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3
Texture—very gravelly or extremely gravelly loam
Content of rock fragments—35 to 60 percent
Structure—weak or moderate, fine or medium subangular blocky
Reaction—mildly alkaline or moderately alkaline

Bk horizon:
Hue—10YR or 7.5YR
Value—5 to 8 dry, 4 to 7 moist
Chroma—1 to 4
Structure—subangular blocky; massive in some pedons
Reaction—mildly alkaline or moderately alkaline

C horizon:
Hue—10YR or 7.5YR
Value—6 or 7 dry, 4 to 6 moist
Chroma—2 or 4
Content of rock fragments—70 to 85 percent pebbles
Consistence—soft to very hard, very friable to very firm
Reaction—mildly alkaline or moderately alkaline
Other features—subhordons that are weak and lime cemented in some pedons

Dewar Series

The Dewar series consists of shallow, well drained, moderately slowly permeable soils that formed in alluvium derived from mixed sources and in a thin mantle of loess. Dewar soils are on fan piedmont remnants. Slopes are 4 to 15 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 46 degrees F.

Taxonomic class: Loamy, mixed, mesic, shallow Xerollic Durargids
Typical pedon: Dewar gravelly silt loam, 4 to 15 percent slopes, in an area of Dewar-Tenabo-Beoska association where pebbles cover approximately 20 percent of the surface:

A1—0 to 2 inches; grayish brown (10YR 5/2) gravelly silt loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; many very fine vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 5 inches thick)

A2—2 to 5 inches; brown (10YR 5/3) silt loam, dark brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 3 inches thick)

Bt—5 to 8 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; strong medium subangular blocky structure; hard, firm, sticky and plastic; common very fine and few fine roots; many very fine tubular pores; 15 percent pebbles; common thin clay films on faces of ped; lime coatings on the underside of pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 14 inches thick)

Btk1—8 to 12 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 5/3) moist; strong medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine and few medium roots; common very fine tubular pores; 15 percent pebbles, 2 percent cobbles; few thin clay films on faces of ped; lime pendants on the underside of rock fragments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 6 inches thick)

Btk2—12 to 17 inches; pale brown (10YR 6/3) gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine, fine, and medium roots; few very fine tubular pores; 15 percent pebbles, 2 percent cobbles; few thin clay films on faces of ped; lime coatings on all sides of rock fragments; 5 percent durines; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 8 inches thick)

Bkam1—17 to 20 inches; very pale brown (10YR 7/3), fractured, indurated duripan, very pale brown (10YR 7/4) moist; strong thick platy structure; extremely hard, extremely firm; few fine roots; few fine interstitial pores in fractures; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (3 to 11 inches thick)

Bkam2—20 to 40 inches; very pale brown (10YR 7/3), continuous, indurated duripan, very pale brown (10YR 7/4) moist; strong thick platy structure; extremely hard, extremely firm; violently effervescent; strongly alkaline (pH 8.8).

Type location: Pershing County, Nevada; approximately 6 miles south of Mill City, on Dun Glen Flat, about 1,500 feet south and 700 feet west of the northeast corner of sec. 6, T. 31 N., R. 35 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 52 degrees F
Depth to an indurated duripan: 13 to 20 inches

Reaction: Neutral to moderately alkaline in the A and Bt horizons

A horizon:
Chroma—2 or 3
Structure—moderate or strong, very thin to thick
platy or fine or medium granular

Bt horizon:
Value—6 to 7 dry, 3 or 4 moist
Chroma—2, 3, or 4 dry, 3 or 4 moist
Texture—gravelly silty clay loam or gravelly clay loam

Content of clay—27 to 35 percent
Content of rock fragments—15 to 30 percent, mainly pebbles
Structure—weak to strong, fine to coarse subangular blocky

Btqk horizon (not in all pedons):
Content of clay—15 to 27 percent
Durinodes—weak or very weak, less than 30 percent

Bkam horizon:
Structure—massive or moderately thick to very thick platelike layers
Cementation—alternately strongly cemented or discontinuously indurated horizons below the duripan in some pedons
Other features—a 1- to 3-inch zone of degraded duripan material along the upper boundary of the horizon in some pedons

Duffer Series

The Duffer series consists of very deep, poorly drained, moderately slowly permeable soils that formed in alluvium, loess, and lake sediments derived from mixed rock sources. Duffer soils are on alluvial flats. Slopes are less than 1 percent. The mean annual
precipitation is about 8 inches, and the mean annual temperature is about 46 degrees F.

**Taxonomic class:** Fine-silty, carbonatic, mesic Aquic Calciorthids

**Typical pedon:** Duffer silty clay loam:

A1—0 to 3 inches; grayish brown (10YR 5/2) silty clay loam, dark brown (10YR 3/3) moist; weak thin platy structure that parts to weak fine subangular blocky; hard, firm, very sticky and very plastic; many very fine and fine roots; many fine tubular and interstitial pores; slightly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary. (2 to 6 inches thick)

A2—3 to 8 inches; gray (10YR 6/1) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium prismatic structure that parts to moderate fine subangular and angular blocky; hard, friable, very sticky and very plastic; many very fine and fine roots; many very fine and common fine tubular pores; many fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (0 to 5 inches thick)

Bw—8 to 16 inches; light gray (2.5Y 7/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and common fine roots; many very fine and few fine interstitial and tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 18 inches thick)

Bk1—16 to 23 inches; light gray (5Y 7/2) silty clay loam, olive gray (5Y 5/2) moist; massive; hard, friable, sticky and plastic; common very fine and few fine roots; common very fine and fine tubular pores; 15 percent light brownish gray (10YR 6/2) lime nodules; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 11 inches thick)

Bk2—23 to 31 inches; white (5Y 8/2) silty clay loam, olive (5Y 5/3) moist; massive; hard, friable, very sticky and very plastic; few very fine and fine roots; many very fine and few fine tubular pores; 15 percent light brownish gray (10YR 6/2) lime nodules 1 to 2 inches in diameter; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (7 to 31 inches thick)

Bk3—31 to 44 inches; white (5Y 8/1) silty clay loam, pale olive (5Y 6/3) moist; massive; hard, firm, very sticky and very plastic; few very fine and fine roots; many very fine and fine tubular pores; 25 percent extremely hard lime nodules as much as 4 inches in diameter; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (0 to 14 inches thick)

Bk4—44 to 58 inches; white (2.5Y 8/2) silty clay loam, grayish brown (2.5Y 5/2) moist; massive; very hard, firm, very sticky and very plastic; few very fine and fine and few medium tubular pores in nodules; 60 percent irregularly shaped lime nodules as much as 7 inches in diameter; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 15 inches thick)

Bk5—58 to 72 inches; white (5Y 8/1) silty clay loam, light olive gray (5Y 6/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores in nodules; 30 percent irregularly shaped nodules similar to those in the horizon above; very strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Pershing County, Nevada; approximately 12 miles south of Winnemucca, in Grass Valley, about 1,320 feet north and 1,320 feet east of the southwest corner of sec. 25, T. 34 N., R. 37 E.

**Range in Characteristics**

**Soil moisture:** Usually moist; saturated between depths of 20 to 40 inches in early spring and generally moist because of capillary moisture from ground water; dry periods in summer and fall

**Soil temperature:** 47 to 52 degrees F

**Depth to the calcic horizon:** 12 to 29 inches

**Control section:** Content of clay—20 to 35 percent; texture—silt loam or silty clay loam

**Reaction throughout the profile:** Generally strongly alkaline or very strongly alkaline but moderately alkaline in some parts of the profile in some pedons

**Other features:** Generally strongly saline-sodic-affected in the uppermost 20 to 30 inches in unreclaimed areas

**A horizon:**

Hue—10YR to 5Y
Value—5 to 7 dry, 3 to 5 moist
Chroma—1 to 4

**Bw horizon:**

Hue—10YR or 2.5Y
Value—4 or 5 moist
Chroma—2 to 4

Structure—weak or moderate, very fine to medium subangular blocky, granular, or platy; massive in the lower part in some pedons

**Bk horizon:**

Hue—10YR to 5Y
Value—6 to 8 dry, 4 to 6 moist
Chroma—1 to 4

Structure—subangular blocky; massive in some pedons

Calcium carbonate equivalent—40 to 60 percent
2C horizon (not in all pedons):
  Hue—10YR to 5Y
  Value—6 to 8 dry, 4 to 6 moist
  Chroma—1 to 4
  Texture—stratified very fine sandy loam to silty clay loam
  Content of clay—15 to 30 percent

Dun Glen Series

The Dun Glen series consists of very deep, well drained, moderately permeable soils that formed in alluvium derived from mixed rock sources and in a mantle of loess. Dun Glen soils are on fan skirts and inset fans. Slopes are 0 to 4 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 49 degrees F.

Taxonomic class: Coarse-loamy, mixed, mesic Typic Camborthids

Typical pedon: Dun Glen very fine sandy loam, 0 to 2 percent slopes:

A—0 to 3 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak thick platy structure; slightly hard, friable, nonsticky and nonplastic; few fine and medium roots; many very fine vesicular pores; moderately alkaline (pH 8.4); clear wavy boundary. (2 to 5 inches thick)

Bw—3 to 10 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak very fine angular blocky structure; slightly hard, friable, nonsticky and nonplastic; common very fine and fine roots; common very fine interstitial and tubular pores; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 10 inches thick)

Bk1—10 to 15 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (4 to 10 inches thick)

Bk2—15 to 47 inches; light brownish gray (10YR 6/2) fine sandy loam, brown (10YR 4/3) moist; massive; soft, friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; common fine seams of lime; violently effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (8 to 36 inches thick)

Bk3—47 to 61 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine interstitial pores; common fine seams of lime; violently effervescent; strongly alkaline (pH 8.8).

Type location: Pershing County, Nevada; approximately 19 miles south of Winnemucca, about 1,600 feet north and 400 feet east of the southwest corner of sec. 26, T. 33 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring

Soil temperature: 47 to 53 degrees F

Control section: Content of clay—9 to 14 percent; texture—fine sandy loam, very fine sandy loam, or loam having 15 to 35 percent fine sand or coarser sand; content of rock fragments—as much as 10 percent when mixed

Other features: As much as 15 percent hard, firm durinodes in some pedons

A horizon:
  Value—6 or 7 dry, 4 or 5 moist
  Chroma—2 or 3
  Reaction—mildly alkaline or moderately alkaline

Bw horizon:
  Value—6 or 7 dry, 4 or 5 moist
  Chroma—2 or 3
  Texture—very fine sandy loam or silt loam
  Content of rock fragments—as much as 10 percent, mainly pebbles
  Reaction—mildly alkaline or moderately alkaline

Bk horizon:
  Value—6 or 7 dry, 4 or 5 moist
  Chroma—2 to 4
  Content of clay—9 to 14 percent
  Content of rock fragments—5 to 30 percent, mainly pebbles
  Reaction—moderately alkaline or very strongly alkaline

Other features—gravel below a depth of 40 inches in some pedons

Eastwell Series

The Eastwell series consists of shallow, well drained, moderately permeable soils that formed in mixed alluvium and loess. Eastwell soils are on fan piedmont remnants. Slopes are 2 to 30 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Loamy-skeletal, mixed, mesic, shallow Haploxerollic Durorthids

Typical pedon: Eastwell very gravelly loam, 2 to 8 percent slopes, in an area of Eastwell-Shabliss-Blackhawk association:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly loam, dark grayish brown (10YR 4/2) moist;
weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and few fine vesicular pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 3 inches thick)

A2—2 to 6 inches; light brownish gray (10YR 6/2) gravelly silt loam, brown (10YR 5/3) moist; moderate thin platy structure; slightly hard, very friable, sticky and slightly plastic; many very fine, common fine, and few medium roots; common very fine tubular pores; 25 percent pebbles, 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 5 inches thick)

Bw—6 to 12 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine tubular pores; 35 percent pebbles, 5 percent cobbles; strongly effervescent; thin lime coatings on the underside of coarse fragments; strongly alkaline (pH 8.6); abrupt smooth boundary. (4 to 13 inches thick)

Bqkm—12 to 20 inches; white (10YR 8/2), strongly cemented duripan that has very thin, discontinuous silica laminae on the horizon surface; massive; hard, firm; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (1 to 8 inches thick)

Bk—20 to 60 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine interstitial pores; 50 percent pebbles, 10 percent cobbles; strongly effervescent; lime coatings on rock fragments; strongly alkaline (pH 8.6).

Type location: Pershing County, Nevada; approximately 2 miles south of Imlay, about 600 feet north and 400 feet east of the southwest corner of sec. 28, T. 32 N., R. 34 E.

Range in Characteristics

Soil moisture: Usually dry during the growing season; moist in winter and spring, dry from June through October

Soil temperature: 47 to 52 degrees F

Depth to a duripan: 10 to 20 inches

Control section: Content of clay—10 to 27 percent; texture—sandy loam or loam; content of rock fragments—35 to 50 percent; mainly pebbles

A horizon:

Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Structure—platy or granular

Effervescence—noneffervescent to strongly effervescent

Bw horizon:

Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Structure—weak or moderate, prismatic or subangular blocky
Effervescence—slightly effervescent to violently effervescent

Bqkm horizon:

Cementation—continuous, strongly silica-cemented duripan and, in most pedons, thin, discontinuous silica lamellae
Effervescence—strongly effervescent or violently effervescent

Bk horizon:

Value—6, 7, or 8 dry, 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—very gravelly loam or very cobbly loam
Content of rock fragments—35 to 60 percent, mainly pebbles and cobbles
Cementation—10 to 40 percent durinodes or weak, discontinuous lime and silica cementation
Effervescence—strongly effervescent or violently effervescent
Segregated lime—common lime coatings on the underside of rock fragments

Enko Series

The Enko series consists of very deep, well drained, slowly permeable soils that formed in alluvium derived from mixed rock sources and influenced by loess and volcanic ash. Enko soils are on fan aprons and fan skirts. Slopes are 2 to 8 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Coarse-loamy, mixed, mesic Durixerollic Camborthids

Typical pedon: Enko fine sandy loam, 2 to 8 percent slopes, in an area of Gwena-Enko-Frewa association:

A1—0 to 2 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine vesicular pores; neutral (pH 7.2); clear smooth boundary. (2 to 7 inches thick)

A2—2 to 6 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine roots;
many very fine tubular pores; neutral (pH 7.2); clear smooth boundary. (0 to 4 inches thick)
Bw1—6 to 16 inches; very pale brown (10YR 7/3) fine sandy loam, yellowish brown (10YR 5/4) moist;
weak fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common very fine
and few fine roots; common very fine tubular pores; mildly alkaline (pH 7.6); clear smooth boundary. (6
to 11 inches thick)
Bw2—16 to 29 inches; light yellowish brown (10YR 6/4)
fine sandy loam, yellowish brown (10YR 5/4) moist;
weak fine subangular blocky structure; slightly hard,
friable, nonsticky and nonplastic; many very fine
roots; common very fine tubular pores; mildly alkaline (pH 7.6); abrupt wavy boundary. (0 to 13
inches thick)
Bqk—29 to 60 inches; pale brown (10YR 6/3) sandy
loam, brown (10YR 4/3) moist; massive; hard, firm,
nonsticky and nonplastic; few very fine tubular
pores; 5 percent pebbles; weak, continuous silica
cementation; strongly effervescent; common fine
lime filaments; strongly alkaline (pH 8.6).

Type location: Pershing County, Nevada;
approximately 20 miles southwest of Winnemucca,
about 2,000 feet east and 1,000 feet south of the
northwest corner of sec. 34, T. 33 N., R. 36 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 49 to 52 degrees F
Combined thickness of the A and Bw horizons: 12 to 30
inches
Control section: Content of clay—10 to 18 percent;
content of rock fragments—0 to 15 percent pebbles
Depth to weak, continuous cementation: 14 to 30 inches
Other features: A substratum that is sandy or that has
gypsum crystals at a depth of 40 inches in some
pedons; a very gravelly or extremely gravelly
substratum below a depth of 40 inches in some
pedons; a noneffervescent Bq horizon above the
Bqk horizon in some pedons

A horizon:
Hue—10YR or 2.5Y
Value—commonly 6 or 7 dry but 5 dry in some
subhorizons in some pedons; 3 or 4 moist
Chroma—2 or 3
Structure—very fine or fine granular or very thin to
medium platy
Consistence—slightly sticky or sticky, slightly plastic
or plastic
Reaction—neutral to moderately alkaline

Bw horizon:
Value—5 to 7 dry, 3 to 5 moist
Chroma—2, 3, or 4
Texture—mainly loam, fine sandy loam, or sandy
loam; strata of silt loam or clay loam in the
upper part in some pedons
Structure—prismatic or angular or subangular
blocky; massive in some pedons
Consistence—slightly sticky or sticky, slightly plastic
or plastic
Reaction—neutral to moderately alkaline, becoming
more alkaline with depth
Carbonates—calcareous in the lower part of the
horizon in some pedons

Bqk and Bq horizons (not in all pedons):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6 moist, 6 to 8 dry
Chroma—1 to 4 dry, 2 to 4 moist
Texture—loam, sandy loam, or fine sandy loam
Silica cementation—weakly, continuously silica-
cemented horizons 10 to 40 inches thick; 20 to
50 percent durinodes or 20 to 75 percent weak,
discontinuous silica cementation in subhorizons
that are not weakly, continuously silica
cemented
Reaction—mildly alkaline to strongly alkaline,
becoming more alkaline with depth
Other features—relict iron mottles or mica particles
in many pedons

Findout Series

The Findout series consists of shallow, well drained,
moderately slowly permeable soils that formed in
residuum derived from limestone. Findout soils are on
side slopes of mountains. Slopes are 30 to 50 percent.
The mean annual precipitation is about 6 inches, and
the mean annual temperature is 52 degrees F.

Taxonomic class: Loamy-skeletal, carbonatic, mesic
Lithic Calciorthids

Typical pedon: Findout very gravelly loam, 30 to 50
percent slopes, in an area of Findout-Puffer-Rock
outcrop association where pebbles cover approximately
30 percent, cobbles 10 percent, and stones 5 percent of
the surface:

A—0 to 4 inches; pale brown (10YR 6/3) very gravelly
loam, brown (10YR 4/3) moist; moderate thin platy
structure; soft, very friable, slightly sticky and
slightly plastic; few very fine and fine roots; many
fine vesicular pores; 30 percent pebbles, 10 percent
cobbles; strongly effervescent; moderately alkaline
(pH 8.4); clear smooth boundary. (1 to 4 inches
thick)

Bk1—4 to 8 inches; pale brown (10YR 6/3) very
gravelly loam, brown (10YR 4/3) moist; weak fine
subangular blocky structure; soft, very friable,
slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; 30 percent pebbles, 5 percent cobbles; 5 percent lime coatings and pendants on rock fragments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (4 to 8 inches thick)

Bk2—8 to 14 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; 40 percent pebbles, 5 percent cobbles; 8 percent lime coatings and pendants on rock fragments; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (6 to 8 inches thick)

R—14 inches; weathered, fractured limestone; unweathered at a depth of 18 inches.

**Type location:** Pershing County, Nevada; in the Augusta Mountains, about 2,500 feet east and 2,000 feet north of the southwest corner of sec. 22, T. 25 N., R. 39 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods in winter and early spring and for very short periods following summer thunderstorms

**Soil temperature:** 53 to 56 degrees F

**Depth to unweathered bedrock:** 12 to 20 inches

**Control section:** Content of clay—18 to 27 percent; content of rock fragments—35 to 50 percent, mainly pebbles

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Carbonates:** Calcareous throughout the profile

**Calcium carbonate equivalent:** 40 to 60 percent, by weight, in the fraction less than 20 millimeters in size

**A horizon:**

- Hue—2.5Y or 10YR
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3

**Bk1 horizon:**

- Value—6 or 7 dry, 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Content of rock fragments—35 to 50 percent, mainly pebbles
- Texture—loam or clay loam
- Content of clay—25 to 35 percent
- Segregated lime—5 to 12 percent coatings and pendants on rock fragments

**Bk2 horizon:**

- Value—7 or 8 dry, 4, 5, or 6 moist
- Chroma—2 or 3

Content of rock fragments—35 to 50 percent, mainly pebbles

Segregated lime—5 to 12 percent coatings and pendants on rock fragments

**Freewa Series**

The Freewa series consists of very deep, well drained soils that formed in sandy alluvium derived from mixed rock sources and influenced by volcanic ash. Frewa soils are moderately rapidly permeable in the upper part and slowly permeable in the lower part. They are on fan skirts. Slopes are 2 to 8 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Mixed, mesic Durorthidic Xeric Torripsamments

**Typical pedon:** Frewa loamy fine sand, 2 to 8 percent slopes, in an area of Gwena-Enko-Freewa association where pebbles cover approximately 1 percent of the surface:

A1—0 to 2 inches; brown (10YR 5/3) loamy fine sand, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; 3 percent pebbles; neutral (pH 6.8); clear smooth boundary. (2 to 4 inches thick)

A2—2 to 8 inches; pale brown (10YR 6/3) loamy fine sand, brown (10YR 5/3) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; neutral (pH 6.8); clear smooth boundary. (2 to 6 inches thick)

Bw—8 to 18 inches; pale brown (10YR 6/3) loamy fine sand, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; common very fine tubular pores; 4 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 10 inches thick)

Bq—18 to 33 inches; pale brown (10YR 6/3) loamy sand, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; few fine and very fine roots; few very fine tubular pores; 20 percent durinodes; moderately alkaline (pH 8.0); abrupt smooth boundary. (4 to 15 inches thick)

Bqk1—33 to 44 inches; pale brown (10YR 6/3) loamy sand, yellowish brown (10YR 5/4) moist; massive; hard, firm, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; many fine irregularly shaped lime filaments; weak, continuous cementation; strongly effervescent; strongly alkaline
Pershing County, Nevada, East Part

(pH 8.6); clear smooth boundary. (8 to 18 inches thick)
Bqk2—44 to 60 inches; pale brown (10YR 6/3) loamy sand, yellowish brown (10YR 5/4) moist; massive; hard, firm, nonsticky and nonplastic; few fine and very fine roots; few very fine tubular pores; common fine irregularly shaped lime filaments; weak, continuous cementation; strongly effervescent; strongly alkaline (pH 8.6).

Type location: Pershing County, Nevada; approximately 6 miles east of Mill City, about 50 feet north of the southwest corner of sec. 33, T. 33 N., R. 36 E. (40 degrees, 40 minutes, 59 seconds north latitude and 117 degrees, 53 minutes, 33 seconds west longitude).

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 52 degrees F
Depth to weak, continuous silica cementation: 15 to 33 inches
Depth to carbonates: 15 to 33 inches
Control section: Texture—loamy sand or loamy fine sand; content of clay—5 to 10 percent; content of rock fragments—as much as 25 percent

A horizon:
Value—5 or 6 dry, 3 or 4 moist (averages 6 dry and 4 moist when the uppermost 7 inches is mixed)
Chroma—2 or 3
Structure—platy, granular, or single grain
Consistence—nonsticky or slightly sticky and nonplastic or slightly plastic
Reaction—neutral or mildly alkaline

Bw horizon:
Value—3 or 4 moist
Texture—loamy fine sand or loamy sand
Content of clay—5 to 10 percent
Content of rock fragments—0 to 10 percent, mainly pebbles
Structure—subangular blocky or platy
Reaction—neutral or mildly alkaline

Bq and Bqk horizons:
Value—6 to 8 dry, 4 to 6 moist
Chroma—2 or 3 dry, 2 to 4 moist
Texture—loamy fine sand or loamy sand
Content of clay—5 to 10 percent
Content of rock fragments—as much as 25 percent pebbles in any one subhorizon
Effervescence—strong or violent in the Bqk horizon
Cementation—weak, continuous silica cementation in some subhorizons within a depth of 33 inches; 15 to 30 percent 10- to 35-millimeter durinodes or 20 to 70 percent weak, discontinuous silica cementation in some subhorizons
Other features—slightly or moderately salt or sodium affected at a depth of 33 to 44 inches

Genegraf Series

The Genegraf series consists of very deep, well drained, moderately slowly permeable soils that formed in alluvium derived from mixed volcanic rocks. Genegraf soils are on fan piedmont remnants. Slopes are 2 to 8 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 52 degrees F.

Taxonomic class: Fine-loamy, mixed, mesic Duric Natrargids

Typical pedon: Genegraf very gravelly very fine sandy loam, 2 to 8 percent slopes, in an area of Genegraf-Chilper-Blueewing association where pebbles cover approximately 65 percent and cobbles 3 percent of the surface:

A1—0 to 2 inches; very pale brown (10YR 7/3) very gravelly very fine sandy loam, brown (10YR 5/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine, common medium, and few coarse vesicular pores; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 6 inches thick)

A2—2 to 6 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 5/3) moist; strong thin platy structure; slightly hard, very friable, sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (0 to 4 inches thick)

Btkn1—6 to 11 inches; light yellowish brown (10YR 6/4) clay loam, brown (10YR 5/3) moist; strong fine prismatic structure; hard, firm, sticky and plastic; common very fine roots; few very fine tubular pores; 10 percent pebbles; many thin clay films on faces of peds and lining pores; common fine, medium, and coarse lime seams; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 7 inches thick)

Btkn2—11 to 18 inches; light yellowish brown (10YR 6/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine roots; few very fine and fine tubular pores; 20 percent pebbles; common thin clay films on faces of
peds and lining pores; many medium and coarse lime seams; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (3 to 9 inches thick)

Bqk—18 to 24 inches; light yellowish brown (10YR 6/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, sticky and plastic; few very fine roots; common very fine tubular pores; 20 percent pebbles; weak, continuous silica cementation; many fine and medium lime filaments; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (6 to 22 inches thick)

Bk1—24 to 36 inches; very pale brown (10YR 7/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; moderate very fine and few fine tubular pores; 20 percent pebbles; common fine lime coatings on pebbles; violently effervescent; strongly alkaline (pH 9.0); gradual smooth boundary.

2Bk2—36 to 60 inches; very pale brown (10YR 7/4) extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine tubular pores; 65 percent pebbles; lime coatings on pebbles; violently effervescent; strongly alkaline (pH 8.0).

Type location: Pershing County, Nevada; in the eastern part of Buena Vista Valley, about 1,900 feet west and 700 feet south of the northeast corner of sec. 36, T. 30 N., R. 36 E.

Range in Characteristics

Soil moisture: Usually dry during the growing season; moist from November through May, dry from June through October

Soil temperature: 53 to 59 degrees F

Depth to the base of the natric horizon: 11 to 24 inches

Depth to weak, continuous silica cementation: 11 to 24 inches

A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Effervescence—noneffervescent to strongly effervescent in the upper part and slightly effervescent to violently effervescent in the lower part

Structure—weak or moderate, fine or medium, platy or subangular blocky

Reaction—moderately alkaline to very strongly alkaline

Btk horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—loam, clay loam, or sandy clay loam

Content of clay—25 to 35 percent

Content of rock fragments—10 to 25 percent pebbles when mixed, generally increasing in amount with depth

Effervescence—strongly effervescent or violently effervescent

Reaction—strongly alkaline or very strongly alkaline

Exchangeable sodium—35 to 80 percent

Bqk and Bk horizons:

Value—6, 7, or 8 dry, 5 or 6 moist

Chroma—2, 3, or 4

Texture—mainly sandy loam, fine sandy loam, loamy sand, or loam; a thin Bqk horizon of gravelly clay loam underlying the natric horizon in some pedons

Content of rock fragments—25 to 50 percent, mainly pebbles, increasing in amount with depth and as much as 65 percent in the lower horizons

Cementation—weak, continuous silica cementation in the upper part of the Bqk horizon and weak, continuous or discontinuous cementation or 0 to 30 percent weakly to strongly cemented durinodes in the lower subhorizons

Reaction—moderately alkaline to very strongly alkaline

Gol Series

The Gol series consists of shallow, well drained, moderately slowly permeable soils that formed in residuum derived from granitic rocks. Gol soils are on side slopes of mountains. Slopes are 30 to 75 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 44 degrees F.

Taxonomic class: Loamy-skeletal, mixed, frigid, shallow Xerolic Haplargids

Typical pedon: Gol very bouldery sandy loam, 30 to 50 percent slopes, in an area of Gol-Say-Rock outcrop association, steep, where pebbles cover approximately 15 percent, cobbles 20 percent, and stones and boulders 15 percent of the surface;

A1—0 to 3 inches; pale brown (10YR 6/3) very bouldery sandy loam, dark grayish brown (10YR 4/2) moist; moderate very thin platy structure; soft, friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine and few fine vesicular pores; 15 percent pebbles, 20 percent cobbles, 15 percent boulders and stones; mildly
alkaline (pH 7.8); clear smooth boundary. (2 to 5 inches thick).

A2—3 to 7 inches; pale brown (10YR 6/3) sandy loam, dark grayish brown (10YR 4/2) moist; weak very thin platy structure; soft, friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (3 to 5 inches thick).

BA—7 to 12 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine and fine tubular pores; 30 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (4 to 7 inches thick).

Bt—12 to 18 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, sticky and slightly plastic; common very fine and fine and medium roots; common very fine and fine and medium tubular pores; 40 percent pebbles, 5 percent cobbles; common thin clay films on faces of pads and lining pores; mildly alkaline (pH 7.6); abrupt wavy boundary. (5 to 10 inches thick).

Cr—18 inches; soft weathered granite.

**Type location:** Pershing County, Nevada; in the Granite Mountain area, in the southern part of the East Range, about 500 feet south and 900 feet west of the northeast corner of sec. 22, T. 28 N., R. 37 E.

**Range in Characteristics**

- **Soil moisture:** Usually dry; moist in winter and spring
- **Soil temperature:** 44 to 47 degrees F
- **Depth to weathered bedrock:** 14 to 20 inches
- **Control section:** Content of clay—18 to 35 percent; content of rock fragments—35 to 50 percent, dominantly pebbles 2 to 5 millimeters in size
- **Reaction throughout the profile:** Neutral or mildly alkaline
- **Other features:** Noncalcareous throughout the solum

**A horizon:**

- Value—5, 6, or 7 dry
- Chroma—2 or 3
- Consistence—soft or slightly hard, very friable or friable

**Bt horizon:**

- Value—5 or 6 dry, 3 or 4 moist
- Chroma—2 to 4
- Texture—very gravelly loam, very gravelly clay loam, or very gravelly sandy clay loam

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**Golconda Series**

The Golconda series consists of moderately deep, well drained, slowly permeable soils that formed in mixed alluvium derived from quartzite, rhyolite, chert, limestone, basalt, andesite, slate, shale, and tuff and in a mantle of volcanic loess. Golconda soils are on fan piedmont remnants. Slopes are 2 to 15 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Hapudurargids

**Typical pedon:** Golconda silt loam, 2 to 8 percent slopes:

- **A1**—0 to 3 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium platy structure parting to moderate very fine subangular blocky; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine vesicular and many very fine interstitial pores; moderately alkaline (pH 8.0); abrupt smooth boundary. (3 to 7 inches thick)
- **A2**—3 to 7 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 6 inches thick)
- **BA**—7 to 10 inches; light yellowish brown (10YR 6/4) sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; strongly alkaline (pH 8.6); abrupt wavy boundary. (6 to 10 inches thick)
- **Bt**—10 to 23 inches; brownish yellow (10YR 6/6) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; weak fine prismatic structure parting to strong fine and medium subangular blocky; very hard, very firm, sticky and plastic; few medium and common very fine roots; common very fine interstitial and many very fine tubular pores; common moderately thick clay films on faces of pads and lining pores; common fine lime threads and common large soft lime masses; 15 percent pebbles; moderately thick lime coatings on the underside of some pebbles; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (8 to 22 inches thick)
- **Bqkm**—23 to 36 inches; very pale brown (10YR 8/3), strongly cemented duripan, very pale brown (10YR 7/4) moist; massive; extremely hard, extremely firm;
few very fine roots in fractures; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary. (10 to 20 inches thick)
Cqk—36 to 60 inches; very pale brown (10YR 8/4) very gravelly loamy coarse sand, light yellowish brown (10YR 6/4) moist; massive; very hard, firm, nonsticky and nonplastic; few very fine roots; 55 percent pebbles; weak silica and lime cementation; strongly effervescent; moderately alkaline (pH 8.4).

Type location: Pershing County, Nevada; approximately 30 miles south of Winnemucca, about 1,200 feet west and 2,500 feet south of the northeast corner of sec. 19, T. 32 N., R. 39 E.

Range in Characteristics

Soil moisture: Usually dry during the growing season; moist in winter and spring, dry from May through October

Soil temperature: 47 to 52 degrees F

Depth to a duripan: 20 to 40 inches

Depth to segregated lime: 8 to 15 inches

Other features: A BA or BC horizon, or both, in some pedons

A horizon:
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 to 4
Reaction—mildly alkaline or moderately alkaline

Btk horizon:
Value—5 to 7 dry, 3 to 5 moist
Chroma—2 to 6
Texture—gravely clay loam, clay loam, or silt loam
Content of clay—27 to 35 percent
Content of rock fragments—5 to 35 percent, mainly pebbles
Structure—generally prismatic but subangular blocky in the lower part in some pedons
Reaction—moderately alkaline to very strongly alkaline

Other features—20 to 50 percent exchangeable sodium; non-effervescent in the upper part of the horizon in some pedons

Bqk horizon (where above the duripan):
Value—6 to 8 dry, 4 to 6 moist
Chroma—2 to 6

Bqkm horizon:
Value—6, 7, or 8 dry, 5 or 6 moist
Chroma—3 or 4
Content of rock fragments—5 to 45 percent, mainly pebbles
Structure—platy; massive in some pedons
Consistence—very hard or extremely hard

Other features—discontinuous lenses of indurated material in some pedons

Cqk horizon:
Texture—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam
Other features—normally having loose or weakly cemented pebbles; no pebbles in some pedons

Goldrun Series

The Goldrun series consists of very deep, somewhat excessively drained, rapidly permeable soils that formed in sandy eolian and lacustrine material derived from a variety of rock sources. Goldrun soils are on sand dunes. Slopes are 4 to 15 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Mixed, mesic Xeric Torripsamments

Typical pedon: Goldrun fine sand, 4 to 15 percent slopes:

A—0 to 8 inches; pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; mildly alkaline (pH 7.8); clear smooth boundary. (5 to 9 inches thick)

C1—8 to 23 inches; very pale brown (10YR 7/3) fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine interstitial pores; mildly alkaline (pH 7.8); clear smooth boundary. (5 to 20 inches thick)

C2—23 to 35 inches; very pale brown (10YR 7/3) fine sand, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; few fine tubular pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (6 to 20 inches thick)

C3—35 to 60 inches; very pale brown (10YR 7/3) fine sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.0).

Type location: Pershing County, Nevada; approximately 11 miles north of Imlay, about 2,300 feet north and 2,100 feet west of the southeast corner of sec. 16, T. 34 N., R. 35 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring

Soil temperature: 47 to 52 degrees

Control section: Texture—dominantly fine sand that has strata of coarse sand, loamy sand, or loamy fine
sand in some pedons; content of clay—1 to 8 percent

Depth to lime: 17 to 35 inches

Other features: Less than 15 percent durinodes or weak, discontinuous silica bridging mineral grains in some pedons

A horizon:
Reaction—neutral to moderately alkaline

2Ck horizon (not in all pedons):
Reaction—moderately alkaline or strongly alkaline
Effervescence—slightly effervescent or strongly effervescent

Goldrun Variant

The Goldrun Variant consists of very deep, well drained, moderately permeable soils that formed in eolian sand-sized aggregates of gyspiferous sandy loam. Goldrun Variant soils are on parna dunes. Slopes are 4 to 15 percent. The mean annual precipitation is 4 to 6 inches, and the mean annual temperature is 53 to 56 degrees F.

Taxonomic class: Coarse-loamy, gyspic (calcareous), mesic Typic Torriorthents

Typical pedon: Goldrun Variant sandy loam, 4 to 15 percent slopes:

A1—0 to 1 inch; light gray (10YR 7/2) sandy loam having about 40 percent 1- to 3-millimeter gypsum crystals; pale brown (10YR 6/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 3 inches thick)

A2—1 to 4 inches; very pale brown (10YR 7/4) sandy loam having about 60 percent 1- to 3-millimeter gypsum crystals; yellowish brown (10YR 5/4) moist; moderate thin platy structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 4 inches thick)

Bk—4 to 18 inches; pale brown (10YR 6/3) sandy loam having about 40 percent 1- to 3-millimeter gypsum crystals; dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; many very fine and common fine tubular pores; few fine lime seams; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (10 to 18 inches thick)

C1—18 to 24 inches; pale brown (10YR 6/3) sandy loam having about 50 percent 1- to 3-millimeter gypsum crystals; dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; common very fine and few fine and coarse roots; many fine interstitial pores; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (4 to 8 inches thick)

C2—24 to 34 inches; pale brown (10YR 6/3) sandy loam having about 50 percent 1- to 3-millimeter gypsum crystals; dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine and few fine tubular pores; few fine lime seams; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (6 to 15 inches thick)

C3—34 to 60 inches; pale brown (10YR 6/3) sandy loam having about 50 percent 1- to 3-millimeter gypsum crystals; dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; violently effervescent; strongly alkaline (pH 8.8).

Type location: Pershing County, Nevada; in the eastern part of Buena Vista Valley, about 1,400 feet east and 2,000 feet north of the southwest corner of sec. 32, T. 29 N., R. 36 E.

Range in Characteristics

Soil moisture: Usually dry; moist for short periods from November through April

Soil temperature: 53 to 57 degrees F

Control section: Texture—gyspiferous material with a field texture of sandy loam; content of calcium carbonate and gypsum—40 to 55 percent, mainly gypsum, throughout the profile

Reaction throughout the profile: Moderately alkaline to strongly alkaline

Golsum Series

The Golsum series consists of moderately deep, well drained, slowly permeable soils that formed in residuum and colluvium weathered from sandstone, chert, shale, and quartzite. Golsum soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 45 degrees F.

Taxonomic class: Clayey-skeletal, montmorillonitic, frigid Aridic Calcic Argixerolls

Typical pedon: Golsum very cobbly loam, 30 to 50 percent slopes, in an area of Golsum-Spinlin-Harcany association; in Humboldt County, east part:

A1—0 to 3 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate very fine
granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine interstitial and common very fine tubular pores; 20 percent pebbles, 15 percent cobbles, 2 percent stones; neutral (pH 7.0); clear smooth boundary. (2 to 6 inches thick)

A2—3 to 9 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine interstitial and common very fine tubular pores; 20 percent pebbles; neutral (pH 7.0); clear smooth boundary. (0 to 8 inches thick)

Bt1—9 to 16 inches; brown (10YR 5/3) very gravelly clay, dark brown (10YR 3/3) moist; weak very fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine, fine, and medium roots; few very fine interstitial and common very fine and fine tubular pores; common thin clay films on faces of ped and lining pores; 35 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (4 to 8 inches thick)

Bt2—16 to 24 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; few very fine roots; common very fine tubular pores; many thin and few moderately thick clay films on faces of ped and lining pores, and coating sand grains and pebbles; 50 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (6 to 10 inches thick)

Btk—24 to 31 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak fine angular blocky structure; slightly hard, very friable, sticky and plastic; few very fine roots; common fine interstitial pores; 50 percent pebbles; strongly effervescent in soft lime masses and seams and slightly effervescent in the matrix; strongly alkaline (pH 8.6); abrupt irregular boundary. (4 to 10 inches thick)

2Cr—31 to 34 inches; yellowish brown (10YR 5/4), weathered bedrock that crushes to very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; massive, but rock structure evident (paralithic contact); very hard, firm, sticky and plastic; 60 percent pebbles; strongly effervescent in seams; strongly alkaline (pH 8.6).

Type location: Humboldt County, Nevada; approximately 4 miles southeast of Winnemucca, in Water Canyon, about 1,400 feet south of the northeast corner of sec. 11, T. 35 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 42 to 47 degrees F
Mollic epipedon: 10 to 16 inches thick; includes at least the upper part of the Bt horizon
Depth to secondary carbonates: 15 to 30 inches
Depth to paralithic contact: 20 to 40 inches
Control section: Content of clay—average of 35 to 45 percent; texture—very gravelly clay, very gravelly clay loam; content of rock fragments—average of 35 to 55 percent, mainly pebbles

A horizon:
Value—4 or 5 dry
Chroma—2 or 3
Structure—weak or moderate, granular or subangular blocky

Bt horizon:
Hue—10YR or 7.5YR
Value—4, 5, or 6 dry, 3 or 4 moist
Chroma—2, 3, or 4
Structure—moderate or strong, subangular or angular blocky or prismatic
Reaction—neutral or mildly alkaline

Btk horizon:
Hue—10YR or 7.5YR
Value—5 or 6 dry, 3, 4, or 5 moist
Chroma—2, 3, or 4
Structure—weak to strong, subangular or angular blocky
Reaction—moderately alkaline or strongly alkaline

Gosumi Series

The Gosumi series consists of deep, well drained, very slowly permeable soils that formed in residuum and colluvium weathered from quartz grit, sandstone, shale, and limestone. Gosumi soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 43 degrees F.

Taxonomic class: Clayey-skeletal, montmorillonitic, frigid Aridic Argixerolls

Typical pedon: Gosumi stony loam, 30 to 50 percent slopes, in an area of Sumine-Gosumi-Nomara association; in Humboldt County, east part

A1—0 to 3 inches; grayish brown (10YR 5/2) stony loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 15 percent pebbles, 2 percent cobbles, 1 percent stones;
neutral (pH 7.0); clear smooth boundary. (2 to 5 inches thick)

A2—3 to 8 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many very fine interstitial pores; 15 percent pebbles; neutral (pH 6.8); abrupt wavy boundary. (4 to 6 inches thick)

Bt1—8 to 13 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate very fine subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine and few medium roots; many very fine interstitial and few very fine tubular pores; many thin clay films on faces of peds and lining pores; 45 percent pebbles; neutral (pH 6.8); clear wavy boundary. (4 to 6 inches thick)

Bt2—13 to 21 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, very sticky and very plastic; common very fine and fine roots; common very fine tubular pores; common thin clay films on faces of peds and lining pores; 35 percent pebbles; neutral (pH 6.8); clear wavy boundary. (6 to 10 inches thick)

Bt3—21 to 32 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium angular and subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; many thin clay films on faces of peds and lining pores; 35 percent pebbles; neutral (pH 6.8); clear wavy boundary. (10 to 12 inches thick)

Bt4—32 to 42 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine interstitial and few very fine tubular pores; many thin clay films coating and bridging sand grains and pebbles; 25 percent pebbles; neutral (pH 6.8); clear wavy boundary. (8 to 12 inches thick)

Btk—42 to 50 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine interstitial and few very fine tubular pores; few thin clay films bridging and coating sand grains and pebbles; 40 percent pebbles; many fine soft masses of lime; violently effervescent in lime masses and slightly effervescent in the matrix; moderately alkaline (pH 8.4); abrupt irregular boundary. (6 to 10 inches thick)

2R—50 to 56 inches; light yellowish brown (10YR 6/4), fractured sandstone, grayish brown (10YR 5/2) moist; yellowish red (5YR 5/6) iron mottles; lime coatings on rock fragments and in cracks.

**Type location:** Humboldt County, Nevada; approximately 4 miles southeast of Winnemucca, about 2,400 feet west and 700 feet north of the southeast corner of sec. 11, T. 35 N., R. 38 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and spring

**Soil temperature:** 42 to 47 degrees F

**Mollic epipedon:** 10 to 16 inches thick

**Depth to secondary carbonates:** 38 to 42 inches

**Depth to bedrock:** 40 to 60 inches

**Control section:** Content of clay—35 to 50 percent; texture—dominantly clay loam or clay; content of rock fragments—35 to 50 percent, mainly pebbles

**Reaction throughout the profile:** Neutral to moderately alkaline (more alkaline in the lower than in the upper subhorizons)

**A horizon:**

Chroma—2 or 3

Structure—granular or platy

Consistence—soft or slightly hard

**Bt horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Texture—dominantly clay loam or clay but includes strata of gravelly or very gravelly sandy loam in the lower part of the horizon

**Gwena Series**

The Gwena series consists of shallow, well drained, very slowly permeable soils that formed in alluvium derived from mixed rock sources and somewhat influenced by loess and volcanic ash. Gwena soils are on fan piedmont remnants. Slopes are 4 to 15 percent. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Nadurargids

**Typical pedon:** Gwena very fine sandy loam, 4 to 15 percent slopes, in an area of Gwena-Enko-Frewa association:

A1—0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; mildly alkaline
(pH 7.8); clear smooth boundary. (1 to 3 inches thick)
A2—2 to 4 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; moderate very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 4 inches thick)
AB—4 to 9 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 5 inches thick)
Bt—9 to 12 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine prismatic structure; hard, firm, sticky and plastic; common very fine roots; common very fine tubular pores; very few thin clay films on faces of ped; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 8 inches thick)
Bt(nk)—12 to 17 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong fine prismatic structure; hard, firm, sticky and plastic; few very fine roots; common very fine tubular pores; few thin clay films on faces of ped; few fine lime filaments; strongly effervescent; strongly alkaline (pH 8.9); abrupt wavy boundary. (3 to 5 inches thick)
Bq—17 to 19 inches; very pale brown (10YR 8/4) clay loam, brownish yellow (10YR 6/6) moist; massive; very hard, very firm, sticky and plastic; few very fine roots; common very fine tubular pores; strong, discontinuous cementation; violently effervescent; strongly alkaline (pH 8.9); clear smooth boundary. (0 to 2 inches thick)
Bqkm—19 to 35 inches; very pale brown (10YR 8/3), indurated duripan, light yellowish brown (10YR 6/4) moist; massive; extremely hard, extremely firm; a thin, continuous laminar cap; violently effervescent; strongly alkaline (pH 8.8); clear irregular boundary. (6 to 17 inches thick)
2B’qk—35 to 52 inches; light gray (10YR 7/2) extremely gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; hard, firm, nonsticky and nonplastic; few very fine tubular pores; alternating layers of weak and strong, discontinuous silica and lime cementation; 70 percent pebbles, 5 percent cobbles; lime coatings on the underside of rock fragments; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (6 to 18 inches thick)
2C—52 to 60 inches; very pale brown (10YR 7/4) very gravelly loamy coarse sand, yellowish brown (10YR 5/6) moist; single grain; loose, nonsticky and nonplastic; common very fine tubular pores; 55 percent pebbles; strongly effervescent lime coatings on the underside of pebbles; a noneffervescent matrix; strongly alkaline (pH 8.6).

Type location: Pershing County, Nevada; approximately 13 miles northeast of Imlay, about 500 feet west and 1,200 feet south of the northeast corner of sec. 28, T. 33 N., R. 36 E.

Range in Characteristics

Soil moisture: Usually dry during the growing season; moist in winter and spring; dry from June through November

Soil temperature: 47 to 52 degrees F

Depth to a duripan: 14 to 20 inches

A horizon:
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3
Consistency—soft or slightly hard, nonsticky or slightly sticky and nonplastic or slightly plastic
Reaction—mildly alkaline or moderately alkaline

Bt horizon:
Hue—10YR or 7.5YR
Value—5 or 6 dry, 3 or 4 moist
Chroma—3 or 4
Texture—loam or clay loam
Content of clay—20 to 35 percent
Content of rock fragments—less than 15 percent, mainly pebbles; as much as 25 percent pebbles in some subhorizons in some pedons
Structure—prismatic or subangular blocky
Consistency—slightly sticky or sticky and slightly plastic or plastic
Reaction—moderately alkaline or strongly alkaline

Exchangeable sodium—20 to 35 percent

Bqkm horizon:
Value—6 to 8 dry, 4 to 6 moist
Chroma—2 to 6
Structure—platy, massive in some pedons
Thickness of the duripan—6 to 17 inches

Harcany Series

The Harcany series consists of very deep, well drained, moderately permeable soils that formed in a mantle of loess overlying residuum and colluvium weathered from argillite, andesite, quartzite, sandstone, shale, and slate. Harcany soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean
annual precipitation is about 13 inches, and the mean annual temperature is about 37 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Pachic Cryoborolls

**Typical pedon:** Harcany stony silt loam, 30 to 50 percent slopes, in an area of Golsum-Spinlin-Harcany association; in Humboldt County, east part:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) stony silt loam, very dark brown (10YR 2/2) moist; strong very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine and medium roots; many very fine interstitial pores; 25 percent pebbles, 5 percent cobbles and stones; neutral (pH 6.6); clear wavy boundary. (3 to 6 inches thick)

A2—4 to 10 inches; dark grayish brown (10YR 4/2) gravelly silt loam, very dark brown (10YR 2/2) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine and medium roots; many very fine interstitial pores; 25 percent pebbles, 5 percent cobbles and stones; neutral (pH 6.6); clear wavy boundary. (4 to 8 inches thick)

A3—10 to 18 inches; dark grayish brown (10YR 4/2) very gravelly silt loam, very dark brown (10YR 2/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine and medium roots; many very fine interstitial pores; 40 percent pebbles, 15 percent cobbles and stones; neutral (pH 6.6); clear wavy boundary. (6 to 10 inches thick)

2C1—18 to 48 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark brown (10YR 3/3) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; common very fine interstitial and few very fine tubular pores; 60 percent pebbles, 5 percent cobbles and stones; neutral (pH 6.8); clear wavy boundary. (20 to 36 inches thick)

2C2—48 to 72 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark brown (10YR 3/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine interstitial and few very fine tubular pores; 50 percent pebbles, 20 percent cobbles and stones; neutral (pH 6.8).

**Type location:** Humboldt County, Nevada; approximately 6 miles southeast of Winnemucca, about 500 feet west and 900 feet north of the southeast corner of sec. 13, T. 35 N., R. 38 E.

**Range in Characteristics**

*Soil moisture:* Usually moist; dry in August and September

*Soil temperature:* 36 to 41 degrees F

*Average soil temperature in summer:* 54 to 59 degrees F

*Mollic epipedon:* 30 to 70 inches thick

**Control section:** Content of clay—10 to 15 percent; texture—extremely gravelly sandy loam or very gravelly silt loam that has strata of gravelly loam or gravelly silt loam; content of rock fragments—50 to 75 percent, mainly pebbles

**A horizon:**
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3

**2C horizon:**
Value—5 or 6 dry
Content of rock fragments—60 to 80 percent, mainly pebbles

**Hawley Series**

The Hawley series consists of very deep, somewhat excessively drained, very rapidly permeable soils that formed in alluvium and eolian deposits derived from mixed rock sources. Hawley soils are on old, wind-sculptured sand sheets. Slopes are generally 0 to 8 percent, but associated dunes may have short slopes of as much as 50 percent. The mean annual precipitation is about 6 inches, and the mean annual temperature is 52 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Typical pedon:** Hawley fine sand, 2 to 8 percent slopes:

A—0 to 3 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many fine interstitial pores; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 8 inches thick)

C1—3 to 23 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many fine interstitial pores; moderately alkaline (pH 8.2); clear smooth boundary. (6 to 20 inches thick)

C2—23 to 31 inches; very pale brown (10YR 7/3) fine sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common very fine roots; many fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 10 inches thick)

Ck—31 to 60 inches; light gray (10YR 7/2) fine sand, grayish brown (10YR 5.2) moist; single grain; loose,
nonsticky and nonplastic; few very fine roots; many fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Pershing County, Nevada; approximately 4 miles west of Imlay, near Rye Patch Reservoir, about 900 feet south and 2,200 feet west of the northeast corner of sec. 2, T. 32 N., R. 33 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods during winter and spring

**Soil temperature:** 53 to 57 degrees F

**Control section:** Texture—stratified fine sand to coarse sand, mixed texture commonly of sand but of fine sand in some pedons, thin strata of loamy fine sand in some pedons; content of rock fragments—0 to 15 percent pebbles

**A horizon:**
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry, 3, 4, or 5 moist
- Chroma—2 or 3
- Reaction—neutral to moderately alkaline

**C horizon:**
- Hue—10YR or 2.5Y
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3
- Reaction—commonly moderately alkaline or strongly alkaline but is mildly alkaline in the upper part in some pedons

Effervescence—slightly effervescent to violently effervescent in some subhorizons

Other features—strata with relict iron oxide stains that have hue of 7.5YR in some pedons

**Hoot Series**

The Hoot series consists of shallow, well drained, moderately slowly permeable soils that formed in residuum and colluvium weathered from andesite and related volcanic rocks. Hoot soils are on crests and side slopes of mountains. Slopes are 4 to 75 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Haplargids

**Typical pedon:** Hoot very cobbly loam, 30 to 50 percent slopes, in an area of Hoot-Burrita-Bojo association where pebbles cover approximately 30 percent and cobbles and stones each 25 percent of the surface:

**A1**—0 to 2 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many fine vesicular pores; 20 percent pebbles, 20 percent cobbles and stones; mildly alkaline (pH 7.8); clear smooth boundary. (1 to 4 inches thick)

**A2**—2 to 4 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common fine tubular pores; 40 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 7 inches thick)

**Bt**—4 to 14 inches; light brown (7.5YR 6/4) extremely gravelly clay loam, brown (7.5YR 5/4) moist; weak very fine subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and few fine roots; many very fine tubular pores; 50 percent pebbles, 15 percent cobbles; common thin clay films on faces of ped and lining pores; mildly alkaline (pH 7.8); abrupt smooth boundary. (3 to 12 inches thick)

**R**—14 inches; andesite.

**Type location:** Pershing County, Nevada; in the southern part of the Tobin Range, on the Jersey Valley side, about 2,100 feet east and 400 feet south of the northwest corner of sec. 3, T. 26 N., R. 39 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in some part in winter and early spring

**Soil temperature:** 47 to 53 degrees F

**Depth to bedrock:** 10 to 20 inches

**A horizon:**
- Hue—10YR or 2.5Y
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3 dry or moist

**Bt horizon:**
- Hue—10YR or 7.5YR; clay films ranging to 5YR
- Texture—extremely gravelly loam, extremely gravelly clay loam, or very gravelly clay loam
- Content of clay—25 to 35 percent
- Content of rock fragments—50 to 70 percent, mainly pebbles
- Structure—very fine or fine subangular blocky
- Reaction—mildly alkaline to strongly alkaline
- Carbonates—commonly noncalcareous; lime coatings on the underside of rock fragments directly above the bedrock in some pedons
Hopeka Series

The Hopeka series consists of very shallow, excessively drained, moderately permeable soils that formed in residuum weathered from limestone. Hopeka soils are on side slopes of mountains. Slopes are 50 to 75 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, frigid
Lithic Xeric Torriorthents

**Typical pedon:** Hopeka very gravelly loam, 50 to 75 percent slopes, in an area of Kram-Hopeka-Rock outcrop association where pebbles cover approximately 50 percent, cobbles 10 percent, and stones 1 percent of the surface:

A—0 to 2 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common fine vesicular pores; 45 percent pebbles, 10 percent cobbles; one-quarter inch of dust, needles, and twigs on the surface; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 4 inches thick)

C—2 to 10 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common fine and coarse roots; few fine tubular pores; 40 percent pebbles, 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 8 inches thick)

R—10 inches; unweathered limestone.

**Type location:** Pershing County, Nevada; in the Augusta Mountains, about 1,050 feet west and 1,300 feet north of the southeast corner of sec. 14, T. 25 N., R. 39 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and spring

**Soil temperature:** 43 to 47 degrees F

**Control section:** Content of clay—18 to 25 percent; content of rock fragments—35 to 60 percent limestone or dolostone pebbles, cobbles, or stones

**Depth to bedrock:** 4 to 10 inches

**Carbonates:** Dominantly violently effervescent but strongly effervescent in the surface layer in some pedons; 40 to 85 percent calcium carbonate equivalent

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**A horizon:**

Hue—10YR or 7.5YR

Value—5 to 7 dry, 3 or 4 moist
Chroma—2 or 3

C horizon:

Hue—10YR or 7.5YR
Value—5 to 7 dry, 3 or 4 moist
Chroma—2 or 3
Structure—weak or moderate subangular blocky; massive in some pedons

Humboldt Series

The Humboldt series consists of very deep, poorly drained, moderately slowly permeable soils that formed in silty alluvium derived from mixed rock sources and influenced by volcanic ash. Humboldt soils are on flood plains. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Fine, montmorillonitic (calcareous), mesic Fluvaquentic Haplaquolls

**Typical pedon:** Humboldt silty clay, slightly saline-sodic:

A1—0 to 3 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; common very fine and few fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 8 inches thick)

A2—3 to 6 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and plastic; many very fine and fine and common medium roots; few very fine and medium tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 8 inches thick)

A3—6 to 13 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; strong fine and medium blocky structure; hard, firm, sticky and plastic; common very fine and few medium roots; common very fine and few tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (5 to 9 inches thick)

C1—13 to 22 inches; gray (10YR 6/1) silty clay, dark gray (10YR 4/1) moist; massive; hard, firm, sticky and plastic; common very fine and fine roots; many very fine, common fine, and few medium tubular pores; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 20 inches thick)

C2—22 to 31 inches; light brownish gray (10YR 6/2) silty clay, dark grayish brown (10YR 4/2) moist; few fine distinct reddish yellow (7.5YR 6/6) mottles;
massive; hard, firm, sticky and plastic; few very fine, fine, and medium roots; many very fine and few fine and medium tubular pores; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (5 to 30 inches thick)

C3—31 to 45 inches; light brownish gray (10YR 6/2) silty clay, dark grayish brown (10YR 4/2) moist; few fine distinct reddish yellow (7.5YR 6/6) mottles; massive; hard, firm, sticky and plastic; few very fine, fine, and medium roots; many very fine and fine and common medium tubular pores; strongly effervescent; very strongly alkaline (pH 9.4); gradual smooth boundary. (4 to 17 inches thick)

C4—45 to 60 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; few fine distinct reddish yellow (7.5YR 6/6) mottles; massive; slightly hard, firm, sticky and plastic; few very fine roots; many very fine and fine and common medium tubular pores; strongly effervescent; very strongly alkaline (pH 9.6).

Type location: Pershing County, Nevada; approximately 18 miles southwest of Winnemucca, near the Humboldt River, about 2,500 feet east and 150 feet south of the northwest corner of sec. 15, T. 34 N., R. 35 E.

Range in Characteristics

Soil moisture: Usually dry; usually saturated for 1 month or more during most years unless drained

Soil temperature: 50 to 54 degrees F

Mollic epipedon: 10 to 24 inches thick

Control section: Content of clay—35 to 45 percent; texture—stratified silty clay loam to clay and minor strata of silt loam in some pedons

Reaction throughout the profile: Mildly alkaline to very strongly alkaline, the higher values being only in sodium affected areas

Carbonates: Slightly effervescent to strongly effervescent throughout most pedons but some noneffervescent strata below a depth of 20 inches in some pedons; less than 15 percent calcium carbonate equivalent

Iron mottles: Distinct or prominent iron mottles in the lower part of the mollic epipedon or directly below; if no mottles occur, matrix chroma of 1 or less

Other features: Stratified very fine sandy loam to fine sand below a depth of 30 inches in some pedons

A horizon:

Hue—10YR or 2.5Y

Value—dominantly 4 or 5 dry (6 in the upper part in some pedons because of deposition), 2 or 3 moist

Chroma—1 or 2

Structure—moderate or strong, fine to coarse, blocky, platy, prismatic, or granular or weak fine to coarse subangular blocky in the Ap horizon

Consistence—slightly hard or hard

Organic matter content—2 to 4 percent

Other features—a buried A horizon in some pedons

C horizon:

Hue—10YR, 2.5Y, 7.5YR, or N

Value—dominantly 6 or 7 dry, 3 to 5 moist; 8 dry and 6 moist in volcanic ash layers

Chroma—0 to 3

Structure—moderate or strong, prismatic or blocky in the upper part; weak structure or massive in the lower part

Carbonates—few to many very fine to medium lime concretions or soft segregations in some subhorizons

Isolde Series

The Isolde series consists of very deep, excessively drained, very rapidly permeable soils that formed in sandy eolian material derived from mixed rock sources. Isolde soils are on sand dunes superimposed over lake plain stream terraces and offshore bars. Slopes are 4 to 15 percent. The mean annual precipitation is about 6 inches, and the mean annual temperature is about 52 degrees F.

Taxonomic class: Mixed, mesic Typic Torripsamments

Typical pedon: Isolde fine sand, 4 to 15 percent slopes, in an area of Isolde-Parran-Appian association:

A—0 to 1 inch; light brownish gray (10YR 6/2) fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; moderately alkaline (pH 8.4); gradual smooth boundary. (0 to 3 inches thick)

C1—1 to 31 inches; light brownish gray (10YR 6/2) fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; many very fine and few coarse roots; many very fine interstitial pores; moderately alkaline (pH 8.4); gradual smooth boundary. (3 to 30 inches thick)

C2—31 to 60 inches; light brownish gray (10YR 6/2) fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; many very fine and few fine and medium roots; many very fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.4).

Type location: Pershing County, Nevada; approximately 14 miles southeast of Lovelock, in the Carson Sink, about 100 feet north and 200 feet
west of the southeast corner of sec. 20, T. 25 N., R. 33 E.

Range in Characteristics

Soil moisture: Usually dry during the growing season; dry from April through mid-November, moist for short periods from mid-November through March

Soil temperature: 53 to 57 degrees F

Control section: Texture—commonly fine sand but in some pedons 50 to 80 percent sand that passes number 40 sieve and 1 to 10 percent that passes number 200 sieve

Reaction throughout the profile: Neutral to moderately alkaline

Other features: A 2C horizon below a depth of 40 inches in some pedons; moderately alkaline to strongly alkaline and non-effervescent to strongly effervescent in the lower part of the C horizon in some pedons

A horizon:
- Hue—10YR or 2.5Y
- Value—5 to 7 dry, 4 or 5 moist
- Chroma—2 or 3

C horizon:
- Hue—10YR or 2.5Y
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3

Iver Series

The Iver series consists of very deep, well drained, moderately permeable soils that formed in loess over residual material and colluvium weathered from quartz grit, sandstone, shale, and quartzite. Iver soils are on concave side slopes of mountains. Slopes are 30 to 75 percent. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 43 degrees F.

Taxonomic class: Coarse-loamy, mixed, frigid Pachic Haploxerolls

Typical pedon: Iver story silt loam, 30 to 50 percent slopes, in an area of Slaven-Linrose-Iver association where pebbles cover approximately 10 percent and stones 1 percent of the surface:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) stony silt loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common fine interstitial pores; 10 percent pebbles, 1 percent stones; neutral (pH 6.8); clear smooth boundary. (2 to 4 inches thick)

A2—4 to 12 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine and medium roots; many fine tubular pores; neutral (pH 6.8); clear smooth boundary. (8 to 20 inches thick)

AB—12 to 20 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; common fine tubular pores; neutral (pH 6.8); clear smooth boundary. (6 to 12 inches thick)

2Bw1—20 to 31 inches; light yellowish brown (10YR 6/4) gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and very fine roots; common fine tubular pores; 15 percent pebbles, 10 percent cobbles; neutral (pH 7.0); clear smooth boundary. (6 to 15 inches thick)

2Bw2—31 to 60 inches; light yellowish brown (10YR 6/4) very cobbly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and very fine roots; common fine tubular pores; 15 percent pebbles, 35 percent cobbles; neutral (pH 7.0).

Type location: Pershing County, Nevada; in the East Range, about 2,200 feet east and 2,000 feet south of the northwest corner of sec. 22, T. 31 N., R. 36.

Range in Characteristics

Soil moisture: Moist from winter through early summer, dry from July through November

Soil temperature: 42 to 47 degrees F

Mollisol epipedon: 20 to 40 inches thick

Depth to lithologic discontinuity: 27 to 38 inches

Control section: Texture—silt loam in the upper part, gravelly silt loam or gravelly loam in the next part, and very gravelly loam, very cobbly loam, or very cobbly very fine sandy loam in the lower part, which averages very cobbly loam or very cobbly very fine sandy loam; content of clay—15 to 18 percent; content of rock fragments—average of 15 to 35 percent, mostly pebbles and cobbles (dominantly cobbles in some subhorizons)

Reaction throughout the profile: Slightly acid or neutral

A horizon:
- Value—4 or 5 dry, 2 or 3 moist
- Chroma—2 or 3

Bw horizon:
- Value—4 to 6 dry, 3 or 4 moist
- Chroma—3 or 4

Structure—subangular blocky; massive in some parts of the horizon in some pedons.
Jerval Series

The Jerval series consists of very deep, well drained, moderately slowly permeable soils that formed in loess over loamy and gravelly alluvium derived from mixed rock sources. Jerval soils are on fan piedmonts and fan piedmont remnants. Slopes are 2 to 8 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 53 degrees F.

Taxonomic class: Fine-loamy, mixed, mesic Duric Natargids

Typical pedon: Jerval stony loam, 2 to 8 percent slopes, in an area of Jerval-Chilper-Bluwing association where pebbles cover approximately 5 percent, cobbles 3 percent, and stones 2 percent of the surface:

A1—0 to 2 inches; light brownish gray (10YR 6/2) stony loam, dark grayish brown (10YR 4/2) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many fine vesicular pores; 5 percent pebbles, 2 percent cobbles, 2 percent stones; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 6 inches thick)

A2—2 to 6 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine tubular pores; 10 percent pebbles, 1 percent cobbles, 1 percent stones; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 7 inches thick)

Btk1—6 to 18 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine prismatic structure; hard, friable, sticky and plastic; many very fine roots; few very fine tubular pores; common thin clay films on faces of ped and lining pores; 20 percent pebbles; lime coatings on all sides of pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (0 to 12 inches thick)

Btk2—18 to 22 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine prismatic structure; hard, friable, sticky and plastic; few very fine roots; common very fine and few tubular pores; few thin clay films on faces of ped and lining pores; 15 percent pebbles; common fine seams of gypsum and lime and lime coatings on all sides of pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 8 inches thick)

2Bq—22 to 29 inches; while (10YR 8/2) very gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 35 percent pebbles; 25 percent strongly cemented durinodes; lime coatings on all sides of pebbles; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (6 to 19 inches thick)

2Bk—29 to 60 inches; very pale brown (10YR 7/3) very gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; many fine interstitial pores; 50 percent pebbles, 5 percent cobbles; lime coatings on all sides of pebbles; strongly effervescent; moderately alkaline (pH 8.4).

Type location: Pershing County, Nevada; approximately 0.5 mile north of the Little McCoy Ranch, in the Jersey Valley, about 1,720 feet east and 3,010 feet south of the northwest corner of sec. 19, T. 26, R. 39 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; dry from late May through November

Soil temperature: 53 to 59 degrees F

Depth to the Bq horizon: 20 to 30 inches

A horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Structure—platy or granular

Bt horizon:
Value—5 or 6 dry, 3 or 4 moist
Chroma—3 or 4
Texture—gravelly clay loam or gravelly silty clay loam
Content of clay—27 to 35 percent
Content of rock fragments—15 to 25 percent, mainly pebbles
Exchangeable sodium—less than 15 percent in the upper part and 15 to 35 percent in the lower part
Reaction—moderately alkaline or strongly alkaline
Other features—segregated secondary carbonates; segregated gypsum commonly in the lower part of the horizon

2Bqk and 2Bk horizons:
Value—7 or 8 dry, 4 to 6 moist
Chroma—2, 3, or 4
Texture—very gravelly sandy loam or very gravelly fine sandy loam
Content of clay—5 to 12 percent
Content of rock fragments—35 to 55 percent, mainly pebbles, but also 0 to 5 percent cobbles
Reaction—moderately alkaline or strongly alkaline
Cementation—20 to 30 percent weak and
moderately strong durinodes in a friable matrix
or weak or strong, discontinuous silica
cementation and thin, discontinuous laminae

Jobpeak Series

The Jobpeak series consists of very shallow, well
drained, moderately permeable soils that formed in
residuum and colluvium weathered from volcanic rocks.
Jobpeak soils are on side slopes of mountains. Slopes
are 50 to 75 percent. The mean annual precipitation is
about 12 inches, and the mean annual temperature is
about 47 degrees F.

Taxonomic class: Loamy-skeletal, mixed, nonacid,
mesic Lithic Xeric Torriorthents

Typical pedon: Jobpeak very gravelly loam, 50 to 75
percent slopes, in an area of Jobpeak-Teguro-Rock
outcrop association where pebbles cover approximately
50 percent and cobbles 10 percent of the surface:

A1—0 to 2 inches; pinkish gray (5YR 6/2) very gravelly
loam, reddish brown (5YR 4/3) moist; weak thin
platy structure; soft, very friable, slightly sticky and
nonplastic; 60 percent pebbles; slightly effervescent;
neutral (pH 7.2); clear smooth boundary. (2 to 4
inches thick)

A2—2 to 5 inches; pinkish gray (5YR 6/2) very gravelly
loam, reddish brown (5YR 4/3) moist; weak thin
platy structure; soft, very friable, slightly sticky and
nonplastic; 45 percent pebbles; neutral (pH 7.0);
aprupt irregular boundary. (2 to 8 inches thick)

2R—5 inches; reddish basalt.

Type location: Pershing County, Nevada; in the
northern part of the Stillwater Range, about 2,300
feet south and 2,000 feet east of the northwest
corner of sec. 15, T. 25 N., R. 36 E.

Range in Characteristics

Soil moisture: Moist in winter and spring, dry in summer
and autumn

Soil temperature: 47 to 52 degrees F

Depth to unweathered bedrock: 4 to 12 inches

Control section: Content of clay—10 to 18 percent;
content of rock fragments—35 to 60 percent,
predominantly pebbles

Reaction throughout the profile: Neutral or mildly alkaline

A horizon:

Hue—10YR or 2.5Y; hue of 5YR or 7.5Y reflecting
bedrock colors in some pedons
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3 dry or moist
Structure—subangular blocky or platy

Knoss Series

The Knoss series consists of shallow, well drained,
slowly permeable soils that formed in mixed alluvium.
Knoss soils are on fan piedmont remnants and partial
ballenas. Slopes are 2 to 8 percent. The mean annual
precipitation is about 6 inches, and the mean annual
temperature is about 51 degrees F.

Taxonomic class: Clayey, montmorillonitic, mesic,
shallow Typic Nadurargids

Typical pedon: Knoss cobry very fine sandy loam, 2 to
8 percent slopes, in an area of Jerval-Knoss-Chilper
association where pebbles cover approximately 5
percent, cobbles 10 percent, and stones 1 percent of
the surface:

A1—0 to 2 inches; light gray (10YR 7/2) cobry very
fine sandy loam, grayish brown (10YR 5/2) moist;
strong thin platy structure; slightly hard, very friable,
nonsticky and slightly plastic; few very fine roots;
many fine and medium vesicular pores; 10 percent
pebbles, 8 percent cobbles; strongly effervescent;
strongly alkaline (pH 8.8); clear smooth boundary.
(1 to 3 inches thick)

A2—2 to 7 inches; pale brown (10YR 6/3) very fine
sandy loam, brown (10YR 5/3) moist; weak thin
platy structure; slightly hard, very friable, nonsticky
and slightly plastic; common very fine roots; many
fine tubular pores; 10 percent pebbles; strongly
effervescent; strongly alkaline (pH 8.8); abrupt
smooth boundary. (0 to 6 inches thick)

Btk—7 to 15 inches; brown (10YR 5/3) clay, dark
brown (10YR 4/3) moist; strong fine prismatic
structure; hard, firm, very sticky and very plastic;
common very fine roots; few very fine tubular pores;
many thin clay films on faces of peds; 5 percent
pebbles; common fine irregular lime seams; strongly
effervescent; strongly alkaline (pH 8.8); abrupt
smooth boundary. (5 to 15 inches thick)

Bqkm—15 to 52 inches; very pale brown (10YR 8/3),
indurated, silica- and lime-cemented duripan that
has a continuous, thin laminar cap; very pale brown
(10YR 7/4) moist; strong thick platy structure;
extremely hard, extremely firm; 40 percent pebbles,
3 percent cobbles, 3 percent stones; violently
effervescent; very strongly alkaline (pH 9.4); abrupt
smooth boundary. (10 to 40 inches thick)

C—52 to 60 inches; pale brown (10YR 6/3) extremely
gravelly loamy sand, brown (10YR 4/3) moist;
massive in places; loose, nonsticky and nonplastic;
many fine interstitial pores; 65 percent pebbles, 5
percent cobbles; very thin lime coatings on rock
fragments; violently effervescent; strongly alkaline
(pH 9.0).
Type location: Pershing County, Nevada; approximately 40 miles southeast of Mill City, in Buena Vista Valley, about 1,250 feet east and 1,300 feet north of the southwest corner of sec. 27, T. 26 N., R. 36 E.

Range in Characteristics

Soil moisture: Usually dry during the growing season; moist for short periods from winter through early spring, dry from late May through November

Soil temperature: 53 to 57 degrees F

Depth to an indurated duripan: 14 to 20 inches

Depth to segregated lime: 2 to 8 inches

Control section: Content of clay—40 to 60 percent; content of rock fragments—0 to 15 percent, mainly pebbles

A horizon:
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Reaction—moderately alkaline or strongly alkaline
Other features—noneffervescent in some pedons

Bt horizon:
Hue—10YR or 7.5YR
Value—5 or 6 dry
Chroma—3 or 4
Structure—prismatic; massive when moist
Other features—a thin gravelly Bt subhorizon in some pedons
Carbonates—a strongly effervescent matrix; segregated lime commonly throughout the horizon
Exchangeable sodium—35 to 60 percent

Bqkm horizon:
Structure—platy; massive in some pedons

Knott Series

The Knott series consists of shallow, well drained, slowly permeable soils that formed in alluvium weathered from mixed rock sources and somewhat influenced by loess high in content of volcanic ash. Knott soils are on fan piedmont remnants and ballenas. Slopes are 2 to 30 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 49 degrees F.

Taxonomic class: Clayey, montmorillonitic, mesic, shallow Typic Nadurargids

Typical pedon: Knott gravelly very fine sandy loam, 8 to 15 percent slopes, in an area of Knott-Sodhouse-Wholan association where pebbles cover approximately 20 percent, cobbles 5 percent, and stones 1 percent of the surface:

A1—0 to 2 inches; pale brown (10YR 6/3) gravelly very fine sandy loam, brown (10YR 5/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 20 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 6 inches thick)

A2—2 to 4 inches; pale brown (10YR 6/3) gravelly very fine sandy loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine vesicular pores; 15 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (0 to 4 inches thick)

Btk—4 to 11 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; moderate medium prismatic structure; hard, firm, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; many thin clay films on faces of peds and lining pores; 10 percent pebbles; moderately alkaline (pH 8.4); gradual smooth boundary. (4 to 8 inches thick)

Btkk—11 to 18 inches; light brown (7.5YR 6/4) gravelly clay, brown (7.5YR 5/4) moist; moderate medium prismatic structure; hard, firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; many thin clay films on faces of peds and lining pores; 20 percent pebbles, 5 percent cobbles; common medium lime seams; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (3 to 8 inches thick)

Bqkm—18 to 34 inches; white (10YR 8/2), indurated duripan, very pale brown (10YR 7/3) moist; massive; extremely hard, extremely firm; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (4 to 20 inches thick)

Ck—34 to 60 inches; light gray (10YR 7/2) very gravelly coarse sandy loam, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine interstitial pores; 45 percent pebbles, 10 percent cobbles; lime coatings on rock fragments; strongly effervescent; moderately alkaline (pH 8.4).

Type location: Pershing County, Nevada; approximately 16 miles southwest of Valmy, in the northern part of Buffalo Valley, about 1,900 feet west and 1,500 feet north of the southeast corner of sec. 21, T. 32 N., R. 41 E.

Range in Characteristics

Soil moisture: Usually dry during the growing season; moist for short periods in winter and spring, dry from June through November

Soil temperature: 47 to 52 degrees F
Depth to a duripan: 10 to 20 inches
Control section: Content of clay—35 to 50 percent; content of rock fragments—10 to 30 percent, mainly pebbles
A horizon:
Value—6 or 7 dry, 4 or 5 moist
Reaction—neutral or mildly alkaline
Bt horizon:
Hue—10YR or 7.5YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—3 to 6
Texture—gravely clay, gravely clay loam, or clay
Content of rock fragments—5 to 30 percent, mainly pebbles
Reaction—moderately alkaline or strongly alkaline
Exchangeable sodium—15 to 35 percent
Other features—no segregated lime in the lower part of the horizon in some pedons
Bqkm horizon:
Hue—10YR or 7.5YR
Value—6 to 8 dry or moist
Chroma—2 to 4
Structure—generally platy near the upper boundary, massive below
Reaction—moderately alkaline or strongly alkaline
Ck horizon:
Value—6 or 7 dry, 4 to 6 moist
Chroma—2 to 4
Texture—very gravelly sandy loam, very gravelly coarse sandy loam, or very gravelly loamy sand
Content of clay—4 to 10 percent
Content of rock fragments—40 to 60 percent, mainly pebbles
Structure—massive or single grain

Kram Series

The Kram series consists of very shallow, somewhat excessively drained, moderately permeable soils that formed in residuum weathered from limestone. Kram soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents
Typical pedon: Kram very gravelly very fine sandy loam, 30 to 50 percent slopes, in an area of Kram-Hopeka-Rock cutcrop association where pebbles cover approximately 50 percent, cobbles 10 percent, and stones 1 percent of the surface:

A1—0 to 2 inches; pale brown (10YR 6/3) very gravelly very fine sandy loam, dark brown (10YR 4/3) moist; common very thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common fine vesicular pores; 45 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 2 inches thick)
A2—2 to 5 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common fine tubular pores; 35 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 3 inches thick)
C—5 to 8 inches; light yellowish brown (2.5Y 6/4) very gravelly loam, olive brown (2.5Y 4/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine tubular pores; 45 percent pebbles, 15 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (3 to 10 inches thick)
R—8 inches; hard, fractured limestone.

Type location: Pershing County, Nevada; in the Augusta Mountains, about 1,700 feet north and 300 feet west of the southeast corner of sec. 14, T. 25 N., R. 39 E.

Range in Characteristics

Soil moisture: Usually dry during the growing season; dry from mid-June through October
Soil temperature: 49 to 52 degrees F
Control section: Content of clay—8 to 18 percent; content of rock fragments—average of 40 to 50 percent pebbles and 5 to 10 percent cobbles and stones
Depth to bedrock: 8 to 14 inches
Reaction throughout the profile: Moderately alkaline or strongly alkaline
Calciuon carbonate equivalent: 40 to 50 percent throughout the profile (in the fraction less than 20 millimeters in size)
A horizon:
Value—4, 5, or 6 dry, 3 or 4 moist
Chroma—2 or 3
Content of rock fragments—35 to 45 percent pebbles and 5 to 10 percent cobbles and stones
Structure—granular or platy
Effervescence—slightly effervescent to violently effervescent
C horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 3 or 4 moist
Chroma—2, 3, or 4
Texture—very gravelly very fine sandy loam or very gravelly loam
Content of rock fragments—45 to 55 percent pebbles and 5 to 10 percent cobbles and stones
Structure—subangular blocky; massive in some pedons
Effervescence—strongly effervescent or violently effervescent

**Laped Series**

The Laped series consists of shallow, well drained, moderately slowly permeable soils that formed in residuum and colluvium weathered from rhyolitic tuff, andesite, and basalt. Laped soils are on low hills. Slopes are 30 to 50 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Durargids

**Typical pedon:** Laped very cobbly loam, 30 to 50 percent slopes, in an area of Laped-Colbar association where pebbles cover approximately 20 percent, cobbles 15 percent, and stones 2 percent of the surface:

A1—0 to 2 inches; very pale brown (10YR 7/3) very cobbly loam, brown (10YR 5/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and few fine vesicular pores; 15 percent pebbles, 25 percent cobbles; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 4 inches thick)

A2—2 to 5 inches; very pale brown (10YR 7/3) very cobbly loam, brown (10YR 5/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 20 percent pebbles, 25 percent cobbles; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 4 inches thick)

AB—5 to 8 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; 20 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 4 inches thick)

Bt—8 to 12 inches; light brown (7.5YR 6/4) gravelly clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; few very fine tubular pores; many thin clay films on faces of peds and lining pores; 20 percent pebbles, 2 percent cobbles; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 7 inches thick)

Btk—12 to 18 inches; light brown (7.5YR 6/4) gravelly clay loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; few very fine tubular pores; common thin clay films on faces of peds and lining pores; 30 percent pebbles, 2 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 6 inches thick)

Bqkm—18 to 22 inches; white (10YR 8/2), indurated duripan, very pale brown (10YR 7/3) moist; massive; extremely hard, extremely firm; violently effervescent; abrupt wavy boundary. (3 to 10 inches thick)

2R—22 inches; hard bedrock.

**Type location:** Pershing County, Nevada; in the western part of the Fish Creek Mountains, about 600 feet east and 900 feet north of the southwest corner of sec. 4, T. 26 N., R. 40 E.

**Range in Characteristics**

**Soil moisture:** Usually dry during the growing season; moist for short periods in winter and early spring, dry from May through October

**Soil temperature:** 47 to 51 degrees F

**Thickness of the solum and depth to a duripan:** 14 to 20 inches

**Depth to bedrock:** 20 to 30 inches

**Control section:** Content of clay—27 to 35 percent; content of rock fragments—15 to 35 percent, mainly pebbles

**Other features:** A thin Bqk horizon above the duripan in some pedons

**A horizon:**
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2, 3, or 4

**Bt horizon:**
- Hue—7.5YR or 10YR
- Value—5 or 6 dry, 3, 4, or 5 moist
- Chroma—4 to 6
- Reaction—dominantly moderately alkaline, but strongly alkaline in the lower part of the horizon in some pedons
- Sodium adsorption ratio—2 to 10, generally becoming more concentrated with depth
- Carbonates—a noneffervescent or slightly effervescent matrix that has secondary carbonates occurring as filaments or coatings in the lower part of the horizon in most pedons
Layview Series

The Layview series consists of shallow, well drained, moderately permeable soils that formed in residuum and colluvium weathered from andesite, rhyolite, and tuff. Layview soils are on crests and side slopes of mountains. Slopes are 4 to 75 percent. The mean annual precipitation is 14 inches, and the mean annual temperature is 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Argic Lithic Cryoborolls

**Typical pedon:** Layview very gravelly loam, 50 to 75 percent slopes, in an area of Layview, very steep-Tusell-Layview association where pebbles cover approximately 70 percent, cobbles 5 percent, and stones 5 percent of the surface:

A—0 to 2 inches; brown (10YR 5/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine and fine vesicular pores; 45 percent pebbles, 5 percent cobbles, 5 percent stones; neutral (pH 7.0); clear smooth boundary. (1 to 3 inches thick)

AB—2 to 7 inches; brown (10YR 5/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine roots; few very fine tubular pores; 30 percent pebbles, 10 percent cobbles, 5 percent stones; neutral (pH 7.0); clear smooth boundary. (2 to 5 inches thick)

Bt1—7 to 11 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; 50 percent pebbles, 5 percent cobbles; few thin clay films on faces of pebbles and fine gravel; neutral (pH 7.0); abrupt wavy boundary. (3 to 10 inches thick)

Bt2—11 to 14 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine and fine tubular pores; 45 percent pebbles, 10 percent cobbles; common thin clay films on faces of pebbles and fine gravel; neutral (pH 7.0); abrupt wavy boundary. (0 to 8 inches thick)

2R—14 inches; rhyolite.

**Type location:** Pershing County, Nevada; near Mount Tobin, in the Tobin Range, about 2,100 feet south and 500 feet east of the northwest corner of sec. 19, T. 29 N., R. 40 E.

**Range in Characteristics**

**Soil moisture:** Usually moist; generally dry in summer and fall, moist from mid-October through mid-July

**Soil temperature:** 43 to 47 degrees F

**Average soil temperature in summer:** 50 to 59 degrees F

**Mollic epipedon:** 7 to 12 inches thick

**Depth to bedrock:** 10 to 14 inches

**Control section:** Content of clay—18 to 30 percent; content of rock fragments—35 to 60 percent, mainly pebbles

**Reaction throughout the profile:** Neutral or mildly alkaline

**A horizon:**
- Value—4 or 5 dry, 2 or 3 moist
- Chroma—2 or 3
- Structure—weak or moderate, subangular blocky or platy

**Bt horizon:**
- Value—4 or 5 dry, 3 or 4 moist
- Chroma—2 to 4
- Texture—very gravelly loam or very gravelly clay loam
- Content of clay—22 to 35 percent
- Structure—weak or moderate, subangular or angular blocky
- Content of rock fragments—35 to 60 percent, mainly pebbles

Linrose Series

The Linrose series consists of moderately deep, well drained, moderately permeable soils that formed in residuum and colluvium weathered from shale, chert, argillite, and quartzite. Linrose soils are on side slopes of mountains. Slopes are 50 to 75 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed frigid Aridic Haploxerolls

**Typical pedon:** Linrose gravelly loam, 50 to 75 percent slopes, in an area of Slaven-Linrose-Iver association where pebbles cover approximately 45 percent, cobbles 5 percent, and stones 1 percent of the surface:

A1—0 to 2 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 45 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4);
clear smooth boundary. (1 to 3 inches thick)

A2—2 to 5 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; 25 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (1 to 4 inches thick)

AB—5 to 10 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; many very fine tubular pores; 45 percent pebbles, 2 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (2 to 8 inches thick)

Bk—10 to 23 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many very fine and common fine roots; common fine tubular pores; 50 percent pebbles, 2 percent cobbles; few thin lime mantles on rock fragments; mildly alkaline (pH 7.6); abrupt smooth boundary. (12 to 33 inches thick)

2R—23 inches; unweathered chert.

**Type location:** Pershing County, Nevada; approximately 2 miles south of Mount Tobin, in the Tobin Range, about 300 feet east and 2,000 feet south of the northwest corner of sec. 28, T. 29 N., R. 40 E.

**Range in Characteristics**

*Soil moisture:* Usually dry during the growing season; moist in winter and spring, dry from July through October

*Soil temperature:* 44 to 47 degrees F

*Mollic epipedon:* 7 to 15 inches thick

*Depth to unweathered bedrock:* 20 to 40 inches

**Control section:** Texture—very gravelly loam or very gravelly sandy loam; content of clay—average of 18 to 27 percent; content of rock fragments—average of 35 to 60 percent, mainly pebbles

**Reaction throughout the profile:** Mildly alkaline or moderately alkaline

**A horizon:**

Chroma—2 or 3

**Bk horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4 dry, 2 to 4 moist

Carbonates—a noneffervescent or slightly effervescent matrix; lime coatings on the underside of rock fragments

**Locane Series**

The Locane series consists of shallow, well drained, slowly permeable soils that formed in residuum weathered from granitic bedrock. Locane soils are on side slopes of mountains. Slopes are 50 to 75 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 45 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Xerolic Haplargids

**Typical pedon:** Locane cobbly loam, 50 to 75 percent slopes, in an area of Locane-Rock outcrop association where pebbles cover approximately 20 percent, cobbles 25 percent, and stones 10 percent of the surface:

A—0 to 2 inches; light brownish gray (10YR 6/2) cobbly loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine tubular and common fine vesicular pores; 10 percent pebbles, 20 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (1 to 6 inches thick)

Bt1—2 to 7 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; many very fine tubular pores; 35 percent pebbles, 5 percent cobbles; common thin clay films on faces of peds; mildly alkaline (pH 7.4); clear smooth boundary. (1 to 5 inches thick)

Bt2—7 to 16 inches; brown (7.5YR 5/4) very gravelly clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and very plastic; common very fine and fine roots; many very fine tubular pores; 35 percent pebbles, 5 percent cobbles; common thin clay films on faces of peds; neutral (pH 7.2); abrupt smooth boundary. (5 to 12 inches thick)

R—16 inches; granite.

**Type location:** Pershing County, Nevada; in the southern part of the East Range, about 2,400 feet west and 2,000 feet north of the southeast corner of sec. 29, T. 28 N., R. 37 E.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist in winter and spring

*Soil temperature:* 44 to 47 degrees F

*Depth to bedrock:* 10 to 20 inches

**Reaction throughout the profile:** Slightly acid or neutral

**A horizon:**

Value—6 or 7 dry, 3 or 4 moist

Chroma—2 or 3
Structure—granular, platy, or subangular blocky
Consistency—slightly hard or hard

**Bt horizon:**
Hue—10YR or 7.5YR
Value—4 or 5 dry, 3 or 4 moist
Chroma—2 to 4
Structure—weak to strong, angular or subangular blocky
Thickness—7 to 15 inches
Content of clay—35 to 50 percent
Content of rock fragments—average of 35 to 50 percent

**Madeline Series**

The Madeline series consists of shallow, well drained, slowly permeable soils that formed in residuum and colluvium weathered from tuff, basalt, and andesite. Madeline soils are on side slopes of plateaus. Slopes are 15 to 30 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 42 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid Lithic Argixerolls

**Typical pedon:** Madeline very stony loam, 15 to 30 percent slopes, in an area of Miller Lux—Ninemile.

Madeline association where pebbles cover approximately 5 percent, cobbles 5 percent, and stones 5 percent of the surface:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very stony loam, dark grayish brown (10YR 4/2) moist; moderate thin and medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine interstitial and few very fine tubular pores; 10 percent pebbles, 2 percent cobbles, 10 percent stones; neutral (pH 7.0); clear smooth boundary. (1 to 4 inches thick)

A2—2 to 6 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine, fine, and coarse roots; common very fine interstitial and few very fine tubular pores; 10 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear smooth boundary. (4 to 7 inches thick)

Bt—6 to 13 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine and common coarse roots; common very fine tubular pores; many thin clay films on faces of ped and lining pores; few moderately thick clay films on faces of ped; 10 percent pebbles; neutral (pH 7.2); clear smooth boundary. (4 to 9 inches thick)

Btk—13 to 17 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 3/4) moist; strong fine and medium angular blocky structure; hard, firm, very sticky and plastic; few very fine and fine roots; common very fine tubular pores; many moderately thick clay films on faces of ped and lining pores; 20 percent pebbles; few fine lime filaments in the matrix and few lime coatings on pebbles; slightly effervescent; neutral (pH 7.2); abrupt wavy boundary. (1 to 6 inches thick)

2R—17 inches; basalt.

**Type location:** Pershing County, Nevada; in the northern part of the Stillwater Range, about 1,000 feet north and 1,300 feet west of the southeast corner of sec. 25, T. 25 N., R. 35 E.

**Range in Characteristics**

**Soil moisture:** Usually moist during the growing season; moist in winter and spring, dry from July through October

**Soil temperature:** 43 to 47 degrees F

**Mollic epipedon:** 7 to 15 inches thick; includes part or all of the argillic horizon

**Depth to bedrock:** 10 to 20 inches

**Control section:** Content of clay—35 to 60 percent; content of rock fragments—5 to 35 percent

**A horizon:**
Hue—5YR to 10YR moist or dry
Value—mainly 4 or 5 dry, 2 or 3 moist; 6 dry and 4 moist in a thin subhorizon in some pedons
Chroma—1 to 3 dry or moist
Structure—weak to strong, platy, granular, or subangular blocky
Reaction—slightly acid or neutral

**Bt1 horizon (not in all pedons):**
Hue—5YR to 10YR moist or dry
Value—3 to 5 dry
Chroma—2 or 3 moist or dry
Texture—sandy clay loam, sandy clay, or clay loam that has 25 to 40 percent clay
Structure—weak to strong, prismatic or subangular or angular blocky
Consistency—slightly hard or hard
Reaction—slightly acid or neutral

**Bt2 and Bt3 horizons:**
Hue—5YR to 10YR moist or dry
Value—3 to 5 dry, 3 or 4 moist
Chroma—2 to 4 dry or moist
Texture—clay, sandy clay, or clay loam that has 35 to 60 percent clay and 5 to 35 percent rock
fragments, including stones, cobbles, and pebbles
Structure—weak to strong, prismatic or subangular or angular blocky
Consistency—hard to extremely hard, friable to very firm
Reaction—slightly acid to mildly alkaline

This pedon is a taxadjunct to the Madeline series because it has lime filaments and lime coatings on rock fragments in the lower part of the Bt horizon, directly above the bedrock. Madeline soils typically have no lime.

Mazuma Series

The Mazuma series consists of very deep, well drained, moderately rapidly permeable soils that formed in alluvium and lacustrine material derived from mixed rock sources. Mazuma soils are on fan skirts and lake plain terraces. Slopes are 0 to 8 percent. The mean annual precipitation is about 6 inches, and average annual temperature is about 50 degrees F.

Taxonomic class: Coarse-loamy, mixed (calcareous), mesic Typic Torrithents

Typical pedon: Mazuma silt loam, strongly saline-sodic, 0 to 2 percent slopes, in an area of Toulon-Mazuma-Bluelog association:

A1—0 to 3 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine roots; many very fine and common fine vesicular pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 4 inches thick)

A2—3 to 10 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (3 to 8 inches thick)

AB—10 to 13 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and fine tubular pores; few thin lenses of stratified loam to loamy sand; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 4 inches thick)

Bk—13 to 22 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and fine tubular pores; common fine distinct brown (7.5YR 5/4) relict mottles; few fine soft masses of lime; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (5 to 10 inches thick)

C1—22 to 34 inches; pale brown (10YR 6/3) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 20 percent pebbles; thin strata of loamy sand; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (8 to 12 inches thick)

C2—34 to 42 inches; light gray (2.5Y 7/2) loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and common fine tubular pores; 10 percent pebbles; few fine distinct dark yellowish brown (10YR 4/4) relict mottles; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (6 to 10 inches thick)

C3—42 to 60 inches; light brownish gray (2.5Y 6/2) gravelly loam, light brownish gray (2.5Y 6/2) moist; massive; hard, firm, slightly sticky and slightly plastic; many very fine tubular pores; 25 percent pebbles; violently effervescent; moderately alkaline (pH 8.4).

Type location: Pershing County, Nevada; in the eastern part of Buena Vista Valley, about 100 feet west and 100 feet north of the southeast corner of sec. 8, T. 29 N., R. 36 E.

Range in Characteristics

Soil moisture: Usually dry; moist for intermittent periods in winter and spring

Soil temperature: 53 to 57 degrees F

Control section: Content of clay—5 to 15 percent; texture—stratified sandy loam, fine sandy loam, very fine sandy loam, or silt loam that in some pedons has thin strata of clay loam or strata of coarse sand, very coarse sand, or loamy sand as much as 10 inches thick; content of rock fragments—as much as 25 percent pebbles in a few strata; electrical conductivity—more than 2 millimhos; exchangeable sodium—15 to 35 percent

A horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry, 4, 5, or 6 moist
Chroma—2, 3, or 4

Bk horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry, 4, 5, or 6 moist
Chroma—2, 3, or 4
Other features—less than 3 percent calcium carbonate equivalent

C horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry, 4, 5, or 6 moist
Chroma—2, 3, or 4
Reaction—moderately alkaline to very strongly alkaline
Segregated lime—few fine or medium calcium carbonate concretions in some horizons in some pedons
Unconformable material—lacustrine silts and clays below a depth of 40 inches in some pedons
Other features—salt crystals and relict mottles in the lower part of the C horizon in some pedons

McConnel Series

The McConnel series consists of very deep, somewhat excessively drained, moderately permeable soils that formed in alluvium derived from mixed rock sources and in a component of loess and volcanic ash over gravelly alluvium. McConnel soils are on inset fans. Slopes are 0 to 2 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 50 degrees F.

Taxonomic class: Sandy-skeletal, mixed, mesic Xerolic Camborthids

Typical pedon: McConnel loam, 0 to 2 percent slopes:
A1—0 to 2 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; slightly hard, very friable, nonsticky and nonplastic; mildly alkaline (pH 7.4); abrupt wavy boundary.
A2—2 to 10 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; neutral (pH 7.2); clear wavy boundary.
Bw—10 to 20 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; mildly alkaline (pH 7.6); clear wavy boundary.
2Bk1—20 to 33 inches; pale brown (10YR 6/3) extremely gravelly loamy coarse sand, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; 60 percent pebbles; thin patchy lime coatings on pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
2Bk2—33 to 60 inches; light gray (10YR 7/2) extremely gravelly loamy coarse sand, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; 65 percent pebbles; lime on the underside of pebbles; violently effervescent; strongly alkaline (pH 8.6).

Type location: Pershing County, Nevada; approximately 18 miles south of Winnemucca, in Grass Valley, about 2,000 feet north and 1,200 feet east of the southwest corner of sec. 22, T. 33 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 50 to 54 degrees F
Control section: Content of clay—average of as much as 5 percent; content of rock fragments—average of 50 to 80 percent, mainly pebbles
Depth to the 2Bk horizon: 10 to 20 inches

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry, 3 or 4 moist (5 dry and 3 moist only in the uppermost 3 inches)
Chroma—1 to 3
Structure—weak or moderate, thin to thick platy or granular; massive in some pedons
Reaction—neutral to moderately alkaline

Bw horizon:
Hue—10YR or 2.5Y
Value—5 to 7 dry, 3 to 5 moist
Chroma—2 to 4 (1 where the horizon has dark sand grains)
Texture—loam, sandy loam, or fine sandy loam
Structure—very fine to medium, granular or subangular blocky
Reaction—neutral to moderately alkaline

2Bk horizon:
Hue—10YR or 2.5Y
Value—5 to 7 dry, 3 to 5 moist
Texture—stratified very gravelly sandy loam to extremely gravelly coarse sand
Chroma—2 to 4 (1 where the horizon has dark sand grains)
Reaction—moderately alkaline to very strongly alkaline

Millerlux Series

The Millerlux series consists of shallow, well drained, very slowly permeable soils that formed in residuum and colluvium weathered from basalt and tuff and in a minor component of loess. Millerlux soils are on the summits of basalt plateaus. Slopes are 4 to 15 percent. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 44 degrees F.
**Taxonomic class**: Clayey, montmorillonitic, frigid Lithic Xerolic Haplargids

**Typical pedon**: Millerlux very stony loam, 4 to 15 percent slopes, in an area of Millerlux-Ninemile-Madeline association where pebbles cover approximately 15 percent, cobbles 5 percent, and stones 6 percent of the surface:

A—0 to 2 inches; light gray (10YR 7/2) very stony loam, dark grayish brown (10YR 4/2) moist; moderate thin and medium platy structure; slightly hard, very friable, sticky and slightly plastic; few very fine roots; few very fine interstitial and vesicular pores; 6 percent stones, 5 percent cobbles, 15 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 6 inches thick)

AB—2 to 6 inches; pale brown (10YR 6/3) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.1); abrupt wavy boundary. (0 to 6 inches thick)

Bt—6 to 13 inches; pale brown (10YR 6/3) clay, dark brown (10YR 3/3) moist; strong fine and medium angular blocky structure; hard, firm, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; common moderately thick clay films on faces of pedds and lining pores; few thin clay films on faces of pedds; 5 percent pebbles; moderately alkaline (pH 8.3); clear smooth boundary. (3 to 7 inches thick)

Btk—13 to 18 inches; brown (10YR 5/3) gravelly clay, dark brown (10YR 4/3) moist; strong fine and medium angular blocky structure; hard, firm, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; many moderately thick clay films on faces of pedds and lining pores and few thick clay films on faces of pedds; 25 percent pebbles; thin lime coatings on the underside of some pebbles; moderately alkaline (pH 8.3); abrupt wavy boundary. (2 to 7 inches thick)

2R—18 inches; basalt.

**Type location**: Pershing County, Nevada; in the northern part of the Stillwater Range, about 200 feet north and 2,300 feet west of the southeast corner of sec. 25, T. 25 N., R. 35 E.

**Range in Characteristics**

**Soil moisture**: Usually dry during the growing season; dry from late June through mid-October, moist in winter and spring

**Soil temperature**: 43 to 47 degrees F

**Depth to bedrock**: 12 to 20 inches

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**A horizon**:

Value—5, 6, or 7 dry; 3 or 4 moist

Chroma—2 or 3

Reaction—generally neutral or mildly alkaline; moderately alkaline in some pedons

**Bt horizon**:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3, 4, or 5 moist

Chroma—generally 3, 4, or 6 but may be 2 dry in the upper part

Content of clay—40 to 60 percent

Structure—fine to coarse, prismatic or angular blocky

Content of rock fragments—less than 15 percent, mainly pebbles

Reaction—neutral to moderately alkaline

**Btk horizon**:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—clay or clay loam

Content of clay—35 to 50 percent

Content of rock fragments—10 to 30 percent, mainly pebbles

Structure—prismatic or angular blocky

Reaction—moderately alkaline or strongly alkaline

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**Misad Series**

The Misad series consists of very deep, well drained, moderately rapidly permeable soils that formed in alluvium derived from mixed rock sources. Misad soils are on fan skirts and inset fans. Slopes are 0 to 15 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F.

**Taxonomic class**: Loamy-skeletal, mixed (calcareous), mesic Durorthidic Torriorthents

**Typical pedon**: Misad gravelly very fine sandy loam, 0 to 2 percent slopes, in an area of Misad-Snapp-Oxcorel association:

A1—0 to 4 inches; light brownish gray (10YR 6/2) gravelly very fine sandy loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine vesicular pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 5 inches thick)

A2—4 to 11 inches; light brownish gray (10YR 6/2) gravelly very fine sandy loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly
hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common very fine tubular pores; 15 percent pebbles; lime coatings on the underside of pebbles; slightly effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (3 to 10 inches thick)

Bqk—11 to 18 inches; pale brown (10YR 6/3) gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; moderate coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; common very fine tubular pores; 20 percent pebbles; 25 percent durinodes; lime coatings on the underside of pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (5 to 10 inches thick)

Bqk2—18 to 28 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine roots; common very fine tubular pores; 50 percent pebbles, 5 percent cobbles; 20 percent durinodes; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (8 to 15 inches thick)

2Cq—28 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; loose, nonsticky and nonplastic; common fine and very fine roots; 60 percent pebbles, 5 percent cobbles; weak, discontinuous silica-cemented lenses; strongly effervescent; moderately alkaline (pH 8.0).

Type location: Pershing County, Nevada; in the western part of the Fish Creek Mountains, about 500 feet east and 2,400 feet north of the southwest corner of sec. 18, T. 29 N., R. 41 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and early spring

Soil temperature: 47 to 51 degrees F

Depth to the Bqk horizon with more than 20 percent durinodes: 8 to 25 inches

Depth to the unconformable 2C horizon: 20 to 35 inches

Control section: Texture—stratified sandy loam, fine sandy loam, very fine sandy loam, loamy coarse sand, or loamy sand; content of rock fragments—35 to 50 percent, mainly pebbles

Carbonates: Normally calcareous; commonly non-effervescent in the surface layer or in the lower part of the profile

Relict iron mottles: Common in any horizon below a depth of 7 inches

A horizon:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2 or 3

B horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—2, 3, or 4

Bq horizon:

Durinodes—10 to 40 percent, weakly or strongly cemented

2C horizon:

Texture—stratified loamy sand, sand, or loamy coarse sand

Content of rock fragments—50 to 70 percent, mainly pebbles

Cementation—commonly discontinuous, weakly or strongly silica-cemented lenses between pebbles in any layer

Effervescence—non-effervescent to strongly effervescent

Misad Variant

The Misad Variant consists of very deep, well drained, moderately permeable soils that formed in loess over alluvium derived from mixed rock sources. Misad Variant soils are on beach terraces and beach plains. Slopes are 2 to 15 percent. The mean annual precipitation is 5 to 8 inches, and the mean annual temperature is 46 to 50 degrees F.

Taxonomic class: Loamy-skeletal, mixed (calcareous), mesic Durothidic Torriorthents

Typical pedon: Misad Variant gravelly very fine sandy loam, 2 to 8 percent slopes, in an area of Misad Variant-Dun Glen Misad Variant, strongly sloping, association where pebbles cover approximately 15 percent of the surface:

A1—0 to 3 inches; pale brown (10YR 6/3) gravelly very fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many very fine vesicular pores; 15 percent pebbles; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (2 to 4 inches thick)

A2—3 to 8 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak very fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 5 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 8 inches thick)

Bqk1—8 to 19 inches; pale brown (10YR 6/3) very fine
sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine tubular pores; 5 percent pebbles; 20 percent 15- to 25-millimeter durinodes; many fine irregular lime filaments; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (4 to 15 inches thick)

Bq2—19 to 23 inches; light gray (10YR 7/2) very fine sandy loam, light yellowish brown (10YR 6/4) moist; massive; very hard, very firm, nonsticky and nonplastic; many very fine expod roots; common very fine tubular pores; 10 percent pebbles; weak, discontinuous lime and silica cementation; many fine irregular lime filaments; violently effervescent; very strongly alkaline (pH 9.4); abrupt smooth boundary. (2 to 6 inches thick)

2C1—23 to 28 inches; very pale brown (10YR 7/4) extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine tubular pores; 65 percent pebbles, 5 percent cobbles; lime coatings on the underside of rock fragments; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (3 to 10 inches thick)

2C2—28 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 65 percent pebbles, 5 percent cobbles; lime coatings on the underside of rock fragments; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Pershing County, Nevada; approximately 3 miles east of Mill City, near Dun Glen Creek, about 1,500 feet south and 1,200 feet east of the northwest corner of sec. 34, T. 33 N., R. 35 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and early spring

**Soil temperature:** 47 to 51 degrees F

**Depth to durinodes:** 8 to 25 inches

**Control section:** Texture—in the upper part, very fine sandy loam having less than 15 percent pebbles; in the lower part, extremely gravelly sandy loam or extremely gravelly coarse sandy loam; content of rock fragments—average of 60 to 75 percent; reaction—strongly alkaline or very strongly alkaline; nonsaline-sodic to a depth of 23 inches and moderately saline-sodic below that depth

**Mulhop Series**

The Mulhop series consists of shallow, well drained, moderately permeable soils that formed in residuum and colluvium weathered from dolostone and limestone. Mulhop soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 45 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Xerollic Calciorthids

**Typical pedon:** Mulhop very gravelly loam, 30 to 50 percent slopes, in an area of Xine-Mulhop-Puffer association where pebbles cover approximately 40 percent, cobbles 10 percent, and stones 5 percent of the surface:

**A1—0 to 2 inches:** pale brown (10YR 6/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine and few fine vesicular pores; 35 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 4 inches thick)

**A2—2 to 6 inches:** grayish brown (10YR 5/2) gravelly loam, dark grayish brown (10YR 4/2) moist; weak very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine and few fine tubular pores; 30 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 6 inches thick)

**Bk1—6 to 12 inches:** brown (10YR 5/3) very gravelly loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium and few coarse roots; few very fine and fine tubular pores; 40 percent pebbles; lime coatings on the underside of pebbles; common fine soft masses of lime; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (4 to 8 inches thick)

**Bk2—12 to 17 inches:** light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine and few medium and coarse roots; few very fine tubular pores; 45 percent pebbles; lime coatings on pebbles; common fine and medium lime filaments; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 5 inches thick)

**2R—17 inches:** dolostone.
Type location: Pershing County, Nevada; approximately 15 miles south of Imlay, in El Dorado Canyon, about 1,120 feet north and 1,120 feet west of the southeast corner of sec. 25, T. 31 N., R. 33 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; moist from winter through early summer, dry from mid-June through October

Soil temperature: 43 to 47 degrees F

Depth to the calcic horizon: 4 to 10 inches

Depth to bedrock: 14 to 20 inches

Control section: Content of clay—18 to 26 percent; content of rock fragments—35 to 60 percent, mainly pebbles

Calcium carbonate equivalent: 20 to 40 percent in the material less than 20 millimeters in size and 5 to 15 percent in the material less than 2 millimeters in size

A horizon:
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3

Bk horizon:
Value—5 or 6 dry, 4 or 5 moist
Chroma—3 or 4
Texture—mainly very gravelly loam; extremely gravelly loam in some subhorizons
Structure—subangular blocky; massive in some pedons
Consistency—soft or slightly hard, very friable or friable, slightly sticky or sticky and slightly plastic or plastic

Needle Peak Series

The Needle Peak series consists of very deep, somewhat poorly drained, moderately slowly permeable soils that formed in alluvium, loess, and lake sediments derived from mixed rock sources. Needle Peak soils are on flood plains. Slopes are 0 to 2 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 49 degrees F.

Taxonomic class: Fine-silty, mixed (calcareous), mesic Aquic Torriorthents

Typical pedon: Needle Peak silt loam, slightly saline-sodic; in Humboldt County, east part:

A—0 to 4 inches; light brownish gray (2.5Y 6/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; moderate thin platy structure that parts easily to weak very fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and medium roots; many very fine and fine interstitial and few fine vesicular pores; moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 5 inches thick)

C—4 to 11 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist, dark grayish brown (10YR 4/2) moist and crushed; massive; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (6 to 9 inches thick)

Ck1—11 to 21 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist, dark grayish brown (10YR 4/2) moist and crushed; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine and fine tubular pores; common fine white lime filaments and masses; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (8 to 12 inches thick)

Ck2—21 to 41 inches; light gray (2.5Y 7/2) silt loam, light olive brown (2.5Y 5/4) moist; few fine faint mottles, yellowish brown (10YR 5/4) moist; weak medium and fine subangular blocky structure; hard, friable, sticky and plastic; few fine and very fine roots; many very fine and fine tubular pores; few thin siliceous films lining pores; many fine faint white lime filaments and veins; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (16 to 24 inches thick)

2Ck—41 to 52 inches; white (2.5Y 8/2) silt loam, light brownish gray (2.5Y 6/2) moist; many fine prominent mottles, strong brown (7.5YR 5/6) moist; weak medium platy structure that parts readily to moderate fine subangular blocky; hard, friable, sticky and plastic; few very fine and fine roots; common very fine and fine tubular and interstitial pores; few crustacean shells; many fine faint white lime filaments; strongly effervescent; strongly alkaline (pH 9.2); abrupt smooth boundary. (6 to 14 inches thick)

2C—52 to 65 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; common medium prominent mottles, strong brown (7.5YR 5/6) moist; weak thick platy structure that parts readily to strong coarse and medium angular blocky; very hard, firm, sticky and plastic; few very fine and fine roots; few fine and very fine tubular and many very fine and fine interstitial pores; common crustacean shells; strongly effervescent; strongly alkaline (pH 9.0).

Type location: Humboldt County, Nevada; approximately 8.5 miles southwest of Winnemucca,
about 500 feet south and 100 feet east of the north quarter corner of sec. 35, T. 35 N., R. 37 E.

Range in Characteristics

Soil moisture: A seasonal high water table at a depth of 4 to 6 feet

Soil temperature: 47 to 52 degrees F

Control section: Content of clay—20 to 35 percent;
texture—silt loam or silty clay loam

Depth to lime: Less than 10 inches

Other features: Mottles below a depth of 20 inches in most pedons

A horizon:
Hue—10YR or 2.5Y
Value—3 or 4 moist
Chroma—2 or 3
Structure—platy or subangular blocky
Reaction—mildly alkaline to strongly alkaline
Other features—slightly effervescent in some pedons

C horizon:
Hue—10YR or 2.5Y
Value—6 to 8 dry, 4 to 6 moist
Chroma—2 or 3
Structure—angular or subangular blocky; massive in some pedons
Reaction—moderately alkaline to very strongly alkaline

Ninch Series

The Ninch series consists of very deep, somewhat excessively drained, moderately rapidly permeable soils that formed in sandy eolian deposits over alluvium and lacustrine sediments high in content of volcanic ash. Ninch soils are on sand sheets and partially stabilized dunes deposited on lake plain terraces and fan skirts. Slopes are 0 to 15 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 49 degrees F.

Taxonomic class: Sandy, mixed, mesic Durorthic Xeric Torrifuvents

Typical pedon: Ninch fine sand, 0 to 15 percent slopes; in Humboldt County, east part:

A—0 to 6 inches; light brownish gray (10YR 6/2) fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; neutral (pH 7.0); clear smooth boundary. (4 to 7 inches thick)

C—6 to 25 inches; light brownish gray (2.5Y 6/2) fine sand, dark grayish brown (2.5Y 4/2) moist; soft, very friable, nonsticky and nonplastic; many very fine roots and few saltgrass rhizomes; many very fine interstitial pores; neutral (pH 7.2); clear wavy boundary. (14 to 22 inches thick)

Cq—25 to 35 inches; light brownish gray (2.5Y 6/2) loamy fine sand, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, nonsticky and nonplastic; many very fine and fine roots; common very fine and fine tubular and many very fine interstitial pores; 25 percent very hard, firm durinodes one-quarter to one-half inch thick; mildly alkaline (pH 7.8); clear wavy boundary. (8 to 14 inches thick)

Cqk—35 to 41 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine and few fine tubular and many very fine interstitial pores; 25 percent hard, firm durinodes one-quarter to three-quarters of an inch thick; few thin silica coatings lining pores and occurring as discontinuous laminae; a slightly effervescent matrix; few fine and medium white (10YR 8/2), strongly effervescent lime coatings on silica laminae; strongly alkaline (pH 8.8); clear wavy boundary. (5 to 10 inches thick)

2Cqk—41 to 70 inches; light gray (2.5Y 7/2) very fine sandy loam, grayish brown (2.5Y 5/2) moist; pockets and seams of light brownish gray (2.5Y 6/2) material; massive; very hard, firm, brittle; few very fine and fine roots; few fine and many very fine tubular pores; common thin silica films lining pores and occurring as discontinuous laminae; weak silica cementation in pockets and seams; strongly effervescent lime coatings on silica laminae and lining pores; very strongly alkaline (pH 9.6).

Type location: Humboldt County, Nevada; approximately 2.5 miles northwest of the Winnemucca airport, about 600 feet south and 2,340 feet west of the northeast corner of sec. 20, T. 36 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and early spring

Soil temperature: 52 to 57 degrees F

Depth to the Cq horizon: 18 to 36 inches

Depth to carbonates: 20 to 40 inches

Control section: Content of clay—5 to 10 percent;
texture—averages loamy fine sand but is stratified with textures ranging from sand to very fine sandy loam and silt loam

A horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Reaction—neutral to moderately alkaline

Cq horizon:
Hue—10YR to 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Content of clay—5 to 10 percent
Consistence—soft to hard, very friable to firm
Reaction—neutral to moderately alkaline in the noncalcareous upper part, strongly alkaline or very strongly alkaline in the calcareous lower part
Cementation—20 to 60 percent hard or very hard, firm or very firm durinodes; weakly cemented layers below a depth of 40 inches in some pedons
Other features—below a depth of 40 inches in some pedons, unconformable loamy or silty lacustrine sediments that are weakly silica-cemented or contain durinodes, are hard or hard and firm or very firm, and have hue of 2.5Y or 5Y

Ninemile Series

The Ninemile series consists of shallow, well drained, very slowly permeable soils that formed in residuum and colluvium weathered from basalt and tuff. Ninemile soils are on broad plateau summits. Slopes are 4 to 15 percent. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 43 degrees F.

Taxonomic class: Clayey, montmorillonitic, frigid Lithic Argixerolls

Typical pedon: Ninemile very stony loam, 4 to 15 percent slopes, in an area of Millerlux-Ninemile-Madeline association where pebbles cover approximately 5 percent, cobbles 5 percent, and stones 5 percent of the surface:

A1—0 to 1 inch; grayish brown (10YR 5/2) very stony loam, very dark grayish brown (10YR 3/2) moist; moderate thin and medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular and few very fine interstitial pores; 5 percent pebbles, 5 percent cobbles, 5 percent stones; neutral (pH 7.2); clear smooth boundary. (1 to 4 inches thick)

A2—1 to 7 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; 15 percent pebbles; neutral (pH 7.2); abrupt wavy boundary. (3 to 7 inches thick)

Bt—7 to 14 inches; yellowish brown (10YR 5/4) gravelly clay, yellowish brown (10YR 5/4) moist; strong medium angular blocky structure; hard, friable, very sticky and very plastic; few very fine and fine roots; common very fine tubular pores; many moderately thick and few thick clay films on faces of peds and lining pores; 25 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.

2R—14 inches; hard basalt.

Type location: Pershing County, Nevada; in the northern part of the Stillwater Range, about 200 feet north and 2,300 feet east of the southwest corner of sec. 25, T. 25 N., R. 35 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 44 to 47 degrees F
Mollic epipedon: 7 to 15 inches thick; commonly includes part or all of the argillic horizon
Depth to bedrock: 10 to 20 inches
Control section: Content of clay—average of 40 to 60 percent; reaction—slightly acid to mildly alkaline
Other features: Bedrock weathered in the uppermost 1 to 3 inches in pedons where it is within a depth of 15 inches

A horizon:
Value—3 to 5 dry, 2 or 3 moist
Chroma—1 to 3
Structure—thin to thick platy; granular in some pedons
Consistence—soft or slightly hard, nonsticky or slightly sticky and nonplastic to plastic
Reaction—slightly acid to mildly alkaline
Other features—in the uppermost 1 or 2 inches, value of 6 and massive in some pedons

Bt horizon:
Hue—5YR, 7.5YR, or 10YR
Value—3 to 6 dry, 3 or 4 moist
Chroma—2, 3, or 4
Content of clay—40 to 60 percent
Texture—clay or gravelly clay
Content of rock fragments—0 to 30 percent pebbles or cobbles
Structure—moderate or strong, subangular or angular blocky or prismatic

Nomara Series

The Nomara series consists of moderately deep, well drained, moderately slowly permeable soils that formed in residuum and colluvium weathered from argillite, slate, andesite, quartzite, and limestone. Nomara soils are on side slopes of mountains. Slopes are 30 to 50
percent. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Calcic Pachic Argixerolls

**Typical pedon:** Nomara stony silt loam, 30 to 50 percent slopes, in an area of Sumine-Gosumi-Nomara association; in Humboldt County, east part:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) stony silt loam, very dark brown (10YR 2/2) moist; weak very thin platy structure; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 5 percent pebbles, 3 percent cobbles, 1 percent stones; neutral (pH 7.0); abrupt wavy boundary. (1 to 5 inches thick)

A2—4 to 10 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 5 percent pebbles; neutral (pH 7.2); clear wavy boundary. (3 to 6 inches thick)

A3—10 to 19 inches; grayish brown (10YR 5/2) gravelly silt loam, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 10 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (4 to 9 inches thick)

Bt—19 to 34 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak very fine subangular blocky structure; very hard, friable, sticky and plastic; few very fine roots; few very fine interstitial and tubular pores; few thin clay films on faces of ped and lining pores; 40 percent pebbles; mildly alkaline (pH 7.6); abrupt wavy boundary. (8 to 15 inches thick)

Btk—34 to 40 inches; brown (10YR 5/3) extremely gravelly clay loam, dark yellowish brown (10YR 4/4) moist; massive; very hard, friable, very sticky and very plastic; few very fine roots; few very fine tubular pores; common thin clay films lining pores; 60 percent pebbles, 20 percent cobbles; many medium soft masses of lime; violently effervescant; strongly alkaline (pH 8.8); abrupt irregular boundary. (3 to 10 inches thick)

2R—40 to 45 inches; light yellowish brown (10YR 6/4), fractured bedrock, dark yellowish brown (10YR 4/4) moist; lime coatings on rock fragments and in cracks.

**Type location:** Humboldt County, Nevada; approximately 4 miles southeast of Winnemucca, about 1,600 feet north and 2,400 feet east of the southwest corner of sec. 12, T. 35 N., R. 38 E.

**Range in Characteristics**

**Soil moisture:** Usually moist during the growing season; moist in winter and spring, dry from July through September

**Soil temperature:** 40 to 47 degrees F

**Mollis epipedon:** 20 to 36 inches thick

**Depth to bedrock:** 20 to 40 inches

**Depth to carbonates:** 17 to 36 inches

**Bt horizon:**
- Value—4 or 5 dry, 2, 3, or 4 moist
- Texture—very gravelly silt loam, very gravelly loam, or extremely gravelly clay loam
- Content of clay—20 to 35 percent
- Content of rock fragments—40 to 80 percent
- Consistence—hard or very hard
- Reaction—mildly alkaline in the upper part, moderately alkaline or strongly alkaline in the lower part

**Orovada Series**

The Orovada series consists of very deep, well drained, moderately permeable soils that formed in loess over alluvium derived from mixed rock sources. Orovada soils are on fan skirts, fan aprons, and inset fans. Slopes are 0 to 8 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Orovada very fine sandy loam, 2 to 8 percent slopes, in an area of Misad-Orovada-Snapp association where pebbles cover approximately 10 percent of the surface:

A1—0 to 2 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, nonsticky and slightly plastic; few very fine roots; many fine vesicular pores; 1 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary. (1 to 4 inches thick)

A2—2 to 6 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, nonsticky and slightly plastic; common very fine roots; many fine vesicular pores; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 6 inches thick)

Bw—6 to 11 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine to medium and few coarse roots; common very fine tubular
pores; mildly alkaline (pH 7.8); clear smooth boundary. (4 to 20 inches thick)

Bq—11 to 15 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, nonsticky and slightly plastic; few very fine roots; few fine tubular pores; 30 percent hard, firm, 10- to 20-millimeter durinodens; common fine irregular lime filaments; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 7 inches thick)

Bq1—15 to 29 inches; very pale brown (10YR 7/3) very fine sandy loam, light yellowish brown (10YR 6/4) moist; massive; hard, friable, nonsticky and nonplastic; many very fine roots; common very fine tubular pores; 60 percent hard, firm, 10- to 20-millimeter durinodens; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (10 to 20 inches thick)

Bq2—29 to 60 inches; very pale brown (10YR 7/3) very fine sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine and few fine roots; common very fine tubular pores; 20 percent hard, firm, 15- to 25-millimeter durinodens; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Pershing County, Nevada; approximately 24 miles southeast of Winnemucca, in Pumpernickel Valley, about 100 feet east and 500 feet south of the northwest corner of sec. 17, T. 32 N., R. 40 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to the Bq or Bqk horizon:** 10 to 28 inches

**Control section:** Texture—stratified fine sandy loam, very fine sandy loam, loam, or silt loam that has strata of loamy fine sand or sandy loam in some pedons; content of clay—5 to 18 percent; content of rock fragments—0 to 15 percent, mainly pebbles

**Other features:** Value of more than 5.5 dry and 3.5 moist when the uppermost 7 inches is mixed

**A horizon:**

Hue—10YR or 2.5Y
Value—5, 6, or 7 dry, 3 or 4 moist
Chroma—2 to 4
Structure—platy, prismatic, or granular
Consistence—soft or slightly hard
Reaction—neutral to moderately alkaline

**Bw horizon:**

Hue—10YR or 2.5Y
Value—6 or 7 dry, 3, 4, or 5 moist
Chroma—2 to 6

**Texture**—fine sandy loam, very fine sandy loam, loam, or silt loam

**Content of clay**—5 to 18 percent

**Content of rock fragments**—average of 0 to 15 percent pebbles

**Structure**—subangular blocky or prismatic

**Reaction**—mildly alkaline or moderately alkaline

**Bq or Bqk horizon:**

Hue—10YR or 2.5Y
Value—6 or 7 dry, 3, 4, or 5 moist
Chroma—2 to 6

**Content of rock fragments**—as much as 30 percent pebbles in some subhorizons in some pedons

**Consistence**—soft to hard, very friable or friable

**Reaction**—moderately alkaline to very strongly alkaline, becoming more alkaline with depth

**Cementation**—contains 20 to 80 percent durinodens

**Other features**—gypsum crystals below a depth of 37 inches in some pedons; a duripan or very gravelly strata below a depth of 40 inches in some pedons

**Oxcorel Series**

The Oxcorel series consists of very deep, well drained, very slowly permeable soils that formed in alluvium derived from mixed rock sources and somewhat influenced by loess. Oxcorel soils are on fan piedmonts and fan piedmont remnants. Slopes are 2 to 8 percent. The mean annual precipitation is about 6 inches, and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Duric Natrargids

**Typical pedon:** Oxcorel gravelly very fine sandy loam, 2 to 8 percent slopes, in an area of Snapp-Oxcorel association where pebbles cover approximately 22 percent and cobbles 2 percent of the surface:

**A1**—0 to 2 inches; light gray (10YR 7/2) gravelly very fine sandy loam, brown (10YR 5/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and few fine and medium vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 6 inches thick)

**A2**—2 to 8 inches; light gray (10YR 7/2) gravelly very fine sandy loam, brown (10YR 5/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; few very fine and fine tubular pores; 15 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 6 inches thick)
 Btn1—8 to 14 inches; light yellowish brown (10YR 6/4) clay, dark brown (10YR 4/3) moist; strong fine and medium prismatic structure; very hard, very firm, sticky and very plastic; common very fine and few fine roots; few very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (4 to 19 inches thick)

 Btn2—14 to 18 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; strong fine and medium angular blocky structure; hard, firm, sticky and very plastic; common very fine and few fine roots; common very fine and few fine tubular pores; many moderately thick clay films on faces of peds and lining pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 13 inches thick)

 Btn3—18 to 24 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and plastic; few very fine and fine roots; common very fine and few fine tubular pores; many moderately thick clay films on faces of peds and lining pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 12 inches thick)

 Btnq—24 to 34 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and plastic; few very fine and fine roots; few very fine and fine tubular pores; 15 percent pebbles; 25 percent strongly cemented durinodes; many fine and medium lime seams; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (4 to 19 inches thick)

 Bqk—34 to 60 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark brown (10YR 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; few very fine and fine tubular pores; 35 percent pebbles, 5 percent cobbles; 20 percent strongly cemented durinodes; common fine lime seams; strongly effervescent; moderately alkaline (pH 8.2).

 Type location: Pershing County, Nevada; approximately 28 miles south of Winnemucca, about 2,500 feet east and 2,200 feet north of the southwest corner of sec. 23, T. 31 N., R. 37 E.

 Range in Characteristics

 Soil moisture: Usually dry; moist for short periods in winter and early spring

 Soil temperature: 47 to 52 degrees F

 Depth to the base of the matric horizon: 20 to 40 inches

 Depth to durinodes: 20 to 34 inches

 Control section: Texture—clay or clay loam; content of clay—35 to 50 percent; content of rock fragments—0 to 10 percent pebbles in the upper part, 10 to 20 percent pebbles in the lower part

 Other features: An E horizon ½ inch to 2 inches thick capping the Bt horizon in some pedons

 A horizon:

 Value—6 or 7 dry, 3, 4, or 5 moist
 Chroma—2 or 3

 Bt horizon:

 Hue—7.5YR or 10YR
 Value—5, 6, or 7 dry, 4, 5, or 6 moist
 Chroma—3 to 6 (3 only in the upper part of the horizon)

 Reaction—moderately alkaline to very strongly alkaline

 Carbonates—a noneffervescent to strongly effervescent matrix in the upper part; segregated lime commonly in the lower part

 Cementation—10 to 30 percent durinodes commonly in the lower subhorizon

 Other features—gypsum in the lower part of the horizon in some pedons

 Bqk horizon:

 Value—5, 6, or 7 dry, 4, 5, or 6 moist
 Chroma—3 to 6

 Content of rock fragments—35 to 60 percent

 Texture—very gravelly sandy loam or very gravelly loam

 Cementation—20 to 60 percent weakly or strongly cemented durinodes and as much as 30 percent weak, discontinuous cementation

 Other features—less than 20 percent durinodes in the upper part in some pedons

 Oxcorel Variant

 The Oxcorel Variant consists of deep, well drained, very slowly permeable soils that formed in residuum and colluvium weathered from basalt, quartzite, chert, and argillite with an admixture of loess high in content of volcanic ash. Oxcorel Variant soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 48 degrees F.

 Taxonomic class: Fine, montmorillonitic, mesic Duric Natargids

 Typical pedon: Oxcorel Variant cobbley loam, 30 to 50 percent slopes, in an area of Trunk-Oxcorel Variant-Bojo association where pebbles cover approximately 15 percent, cobbles 15 percent, and stones 5 percent of the surface:
**A1**—0 to 1 inch; light gray (10YR 7/2) cobbly loam, pale brown (10YR 6/3) moist; weak very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 5 percent pebbles, 15 percent cobbles; strongly alkaline (pH 8.6); clear smooth boundary. (1 to 4 inches thick)

**A2**—1 to 4 inches; light gray (10YR 7/2) silt loam, pale brown (10YR 6/3) moist; moderate very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 5 inches thick)

**Btk1**—4 to 11 inches; brown (10YR 5/3) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; very hard, firm, sticky and plastic; common very fine roots; common very fine tubular pores; 5 percent pebbles; many thin clay films on faces of pebbles and lining pores; common fine soft masses of lime; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (5 to 10 inches thick)

**Btk2**—11 to 18 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; weak medium prismatic structure; hard, firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; 5 percent pebbles; few thin clay films on faces of pebbles and lining pores; few fine soft masses of lime; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (5 to 11 inches thick)

**Btk3**—18 to 32 inches; white (10YR 8/2) gravelly clay loam, light yellowish brown (10YR 6/4) moist; massive; hard, firm, sticky and plastic; few very fine roots; few very fine tubular pores; 15 percent pebbles; 20 percent strongly cemented durinodes; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (10 to 20 inches thick)

**Btk4**—32 to 55 inches; white (10YR 8/2) clay loam, light yellowish brown (10YR 6/4) moist; massive; hard, firm, sticky and plastic; very few fine roots; few very fine tubular pores; 10 percent pebbles; 25 percent strongly cemented durinodes; violently effervescent; moderately alkaline (pH 8.0). (12 to 30 inches thick)

**R**—55 inches; basalt.

**Type location:** Pershing County, Nevada; in the East Range, near Pleasant Valley, about 1,250 feet west and 2,500 feet north of the southeast corner of sec. 9, T. 29 N., R. 38 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods in winter and early spring

**Soil temperature:** 47 to 52 degrees F

**Depth to bedrock:** 40 to 60 inches

**Depth to the Bqk horizon:** 18 to 29 inches

**Control section:** Content of clay—35 to 50 percent; texture—clay or clay loam

**Content of durinodes in the Bqk horizon:** 20 to 40 percent

**Parran Series**

The Parran series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in clayey lacustrine material derived from mixed rock sources. Parran soils are on lake plain terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Typic Salorthids

**Typical pedon:** Parran silty clay, 0 to 2 percent slopes, in an area of Isolde-Parran-Appian association where pebbles cover about 1 percent of the surface:

**A1**—0 to 2 inches; light gray (2.5Y 7/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate thin platy structure; hard, firm, very sticky and very plastic; few very fine roots; many very fine vesicular pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (1 to 3 inches thick)

**A2**—2 to 7 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate very fine subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (3 to 8 inches thick)

**Bz**—7 to 13 inches; light brownish gray (2.5Y 6/2) silty clay, grayish brown (2.5Y 5/2) moist; weak very thin platy structure; soft, very friable, sticky and plastic; very few fine and fine roots; few very fine tubular pores; common fine salt crystals; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (5 to 15 inches thick)

**Bzy**—13 to 26 inches; light brownish gray (2.5Y 6/2) silty clay, grayish brown (2.5YR 5/2) moist; few fine distinct mottles; massive; slightly hard, very friable, sticky and plastic; few very fine roots; common very fine tubular pores; strongly effervescent; common fine salt and gypsum crystals; strongly alkaline (pH 8.8); clear smooth boundary. (6 to 15 inches thick)

**C**—26 to 60 inches; light brownish gray (2.5Y 6/2) silty clay, dark gray (5YR 4/1) moist; common medium distinct mottles; massive; very hard, firm, very sticky
and very plastic; few very fine pores; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** Pershing County, Nevada; in the Carson Sink, about 500 feet east and 900 feet north of the southwest corner of sec. 21, T. 25 N., R. 33 E.

**Range in Characteristics**

**Soil moisture:** Saturated within a depth of 40 inches by the water table or a capillary fringe in most years

**Soil temperature:** 53 to 57 degrees F

**Salic horizon:** Thickness—12 to 28 inches; salt content—2 to 6 percent salt more soluble in cold water than gypsum; gypsum—small or moderate amounts in at least some horizons in most pedons

**Depth to mottles:** 10 to 30 inches

**Control section:** Content of clay—35 to 55 percent; texture—clay, silty clay, or silty clay loam

**Reaction throughout the profile:** Strongly alkaline or very strongly alkaline

**A horizon:**

Hue—10YR, 2.5Y, or 5Y  
Value—4 or 5 moist, 6, 7, or 8 dry  
Chroma—1 to 4  
Structure—granular or subangular blocky

**Bzy horizon:**

Hue—2.5Y or 5Y  
Value—4 or 5 moist, 6, 7, or 8 dry  
Chroma—1, 2, 3, or 4

**C horizon:**

Hue—2.5Y or 5Y  
Value—4 or 5 moist, 6, 7, or 8 dry  
Chroma—1, 2, 3, or 4  
Structure—angular or subangular blocky or platy; massive in some pedons  
Mottles—common or many, fine to large, and faint to prominent  
Other features—thin, discontinuous tufa deposits below a depth of 12 inches in some pedons; ostracods in some pedons

**Pirouette Series**

The Pirouette series consists of shallow, well drained, moderately permeable soils that formed in residuum and colluvium weathered from tuff and basalt. Pirouette soils are on summits of plateaus. Slopes are 4 to 15 percent. The mean annual precipitation is about 6 inches, and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Typic Nadurargids

**Typical pedon:** Pirouette very stony very fine sandy loam, 4 to 15 percent slopes, in an area of Pirouette-Rezave-Rubble land association where pebbles cover about 25 percent, cobbles 10 percent, and stones 10 percent of the surface:

A1—0 to 2 inches; very pale brown (10YR 7/3) very stony very fine sandy loam, brown (10YR 5/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many fine and medium vesicular pores; 15 percent pebbles, 10 percent stones; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 3 inches thick)

A2—2 to 4 inches; pale brown (10YR 6/3) very stony very fine sandy loam, brown (10YR 5/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 10 percent pebbles, 5 percent cobbles, 10 percent stones; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 5 inches thick)

Bt—4 to 9 inches; brown (7.5YR 5/4) very cobbly clay loam, brown (7.5YR 4/4) moist; moderate medium prismatic structure; hard, firm, sticky and plastic; common very fine and few fine roots; common very fine and fine tubular pores; 25 percent pebbles, 20 percent cobbles; many thin clay films lining pores and on faces of pedds; slightly effervescent; strongly alkaline (pH 9.0); gradual smooth boundary. (3 to 6 inches thick)

Btk—9 to 14 inches; light brown (7.5YR 6/4) very cobbly clay loam, brown (7.5YR 4/4) moist; weak fine prismatic structure; hard, firm, sticky and plastic; common very fine roots; common very fine tubular pores; 25 percent pebbles, 20 percent cobbles; many thin clay films lining pores and on faces of pedds; few medium filaments of lime; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (3 to 6 inches thick)

Bq—14 to 16 inches; white (10YR 8/2), indurated duripan, pale brown (10YR 6/3) moist; extremely hard, extremely firm; violently effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (1 to 3 inches thick)

2R—16 inches; basalt.

**Type location:** Pershing County, Nevada; in the Sou Hills, along the northern part of Dixie Valley, about 1,000 feet east and 500 feet south of the northwest corner of sec. 6, T. 26 N., R. 38 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and spring

**Soil temperature:** 52 to 56 degrees F

**Combined thickness of the A and Bt horizons:** 8 to 14 inches
Depth to a duripan: 11 to 20 inches
Depth to bedrock: 12 to 23 inches
Reaction throughout the profile: Moderately alkaline to very strongly alkaline

A horizon:
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3

Btn horizon:
Hue—7.5YR or 5YR
Value—5 or 6 dry, 4 to 6 moist
Chroma—3 or 4
Texture—very cobbly clay loam, very cobbly silty clay loam, or very cobbly loam
Content of clay—25 to 35 percent
Content of rock fragments—35 to 50 percent
Structure—dominantly weak or moderate, medium or fine prismatic but subangular blocky in the Btn3 horizon in some pedons
Thickness—6 to 10 inches

Bqk horizon:
Does not occur in some pedons where the duripan is within a depth of 14 inches

Pocan Series

The Pocan series consists of deep, well drained, moderately permeable soils that formed in colluvium and residuum weathered from quartzite, slate, shale, sandstone, chert, and limestone. Pocan soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Fine-loamy, mixed, mesic Xerollc Camborthids

Typical pedon: Pocan stony loam, 30 to 50 percent slopes, in an area of Trunk-Pocan association:
A1—0 to 3 inches; pale brown (10YR 6/3) stony loam, dark brown (10YR 3/3) moist; weak fine and moderate very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine fibrous roots; many very fine interstitial pores; 1 percent stones; neutral (pH 7.2); clear smooth boundary. (2 to 6 inches thick)
A2—3 to 10 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few fine and common very fine roots; many very fine interstitial pores; mildly alkaline (pH 7.4); clear smooth boundary. (5 to 11 inches thick)
Bw—10 to 26 inches; yellowish brown (10YR 5/4) gravelly loam, dark brown (10YR 4/3) moist; moderate medium angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular and interstitial pores; 15 percent fine pebbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (13 to 21 inches thick)
Bk—26 to 48 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; common very fine tubular and interstitial pores; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary. (20 to 25 inches thick)
2R—48 inches; quartzite.

Type location: Pershing County, Nevada; about 25 miles southeast of Winnemucca, in the southern part of the Sonoma Range, about 1,000 feet south and 1,000 feet east of the northwest corner of sec. 28, T. 32 N., R. 39.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 52 degrees F
Depth to carbonates: 20 to 38 inches
Depth to bedrock: 40 to 60 inches
Control section: Content of clay—18 to 25 percent; texture—dominantly loam or gravelly loam that has thin strata of clay loam in some pedons
Content of rock fragments—5 to 35 percent

A horizon:
Reaction—neutral or mildly alkaline

Bw horizon:
Content of rock fragments—5 to 35 percent
Reaction—neutral or mildly alkaline
Other features—slightly effervescent in the lowermost 2 or 3 inches of the horizon in some pedons

Bk horizon:
Content of rock fragments—15 to 35 percent
Reaction—moderately alkaline or strongly alkaline

Pocker Series

The Pocker series consists of very deep, moderately well drained, slowly permeable soils that formed in clayey alluvium derived from mixed rock sources. Pocker soils are on stream terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 49 degrees F.
Taxonomic class: Fine, montmorillonitic (calcareous), mesic Typic Torrifluvents

Typical pedon: Pocker silty clay loam:
A1—0 to 3 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; slightly hard, friable, sticky and plastic; few medium and very fine roots; common very fine and few fine vesicular pores; few fine and very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (1 to 4 inches thick)

A2—3 to 6 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; slightly hard, friable, sticky and plastic; common very fine to medium roots; few very fine and fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (2 to 4 inches thick)

C1—6 to 10 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine to medium roots; few very fine and fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (2 to 6 inches thick)

C2—10 to 27 inches; pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; moderate very coarse prismatic structure; hard, friable, very sticky and very plastic; many very fine to medium expod roots; few very fine, fine, and medium tubular pores; violently effervescent; very strongly alkaline (pH 9.2); abrupt wavy boundary. (12 to 25 inches thick)

C3—27 to 32 inches; light gray (10YR 7/2) silty clay, brown (10YR 4/3) moist; massive; hard, friable, very sticky and very plastic; few medium and very fine roots; few very fine, fine, and medium pores; violently effervescent; very strongly alkaline (pH 9.2); clear wavy boundary. (3 to 11 inches thick)

Ck—32 to 60 inches; light gray (10YR 7/2) silty clay, pale brown (10YR 6/3) moist; massive; very hard, friable, very sticky and very plastic; few medium and very fine roots; few very fine, fine, and medium pores; violently effervescent; many fine lime nodules; very strongly alkaline (pH 9.2).

Type location: Pershing County, Nevada; about 19 miles south of Winnemucca, in Grass Valley, about 1,320 feet south of the northwest corner of sec. 30, T. 33 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 53 degrees F
Depth to the Ck horizon: 32 to 50 inches
Control section: Content of clay—35 to 50 percent; texture—clay, silty clay, or silty clay loam that has thin strata of silt loam or loam in many pedons

Reaction throughout the profile: Strongly alkaline or very strongly alkaline

Salt and sodium: Moderately or strongly saline-sodic affected to a depth of 40 inches

A horizon:
Hue—10YR or 2.5Y
Structure—weak to strong, very thin to medium, platy
Consistency—slightly hard or hard
Other features—a buried A horizon below a depth of 10 inches in many pedons

C horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry, 4, 5, or 6 moist
Chroma—2 or 3
Other features—few to many very hard or extremely hard, fine to large lime nodules in the Ck horizon

Pocker Variant

The Pocker Variant consists of very deep, moderately permeable soils that formed in alluvium derived from mixed rock sources. Drainage has been altered by the release of irrigation water by Rye Patch Reservoir, causing an annual water table that is higher than is typical in these soils. Pocker Variant soils are on flood plains. Slopes are 0 to 2 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 50 degrees F.

Taxonomic class: Coarse-silty, mixed (calcareous), mesic Aquic Xeroalfs

Typical pedon: Pocker Variant loam, wet:
A1—0 to 2 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; common very fine and fine interstitial pores; violently effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (1 to 4 inches thick)

A2—2 to 6 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 8 inches thick)

C—6 to 17 inches; light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many
Pershing County, Nevada, East Part

very fine, common fine, and few medium roots; common very fine tubular pores; violently effervescent; moderately alkaline (pH 8.6); clear smooth boundary. (9 to 14 inches thick)

Cky—17 to 45 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine tubular pores; few fine gypsum masses; violently effervescent; common fine soft masses of lime; moderately alkaline (pH 8.2); clear smooth boundary. (22 to 35 inches thick)

C'—45 to 60 inches; light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; few fine distinct light reddish brown (5YR 6/4) iron mottles; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; strongly effervescent; moderately alkaline (pH 8.2).

Type location: Pershing County, Nevada; about 0.2 mile south of Rye Patch Reservoir, about 1,400 feet south and 200 feet west of the northeast corner of sec. 19, T. 30 N., R. 33 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 48 to 50 degrees F
Depth to iron mottles: 40 to 50 inches
Control section: Content of clay—10 to 18 percent; content of rock fragments—0 to 5 percent; effervescence—strongly effervescent or violently effervescent

Calcium carbonate equivalent: 2 to 10 percent
Other features: No Cky horizon in some pedons
C horizon:
Texture—averages silt loam but includes thin strata of loam, or very fine sandy loam in some pedons

Polum Series

The Polum series consists of very deep, well drained, moderately permeable soils that formed in residuum and colluvial derived from limestone, dolomite, and calcareous shale. Polum soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 43 degrees F.

Taxonomic class: Loamy-skeletal, mixed Calcic Pachic Cryoborolls
Typical pedon: Polum gravelly silt loam, 30 to 50 percent slopes, in an area of Polum-Dekoom-Polum Variant association:

A1—0 to 1 inch; dark grayish brown (10YR 4/2) gravelly silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine tubular pores; 25 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (1 to 7 inches thick)

A2—1 to 7 inches; dark grayish brown (10YR 4/2) gravelly silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine and medium roots; few very fine tubular pores; 25 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 10 inches thick)

A3—7 to 17 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine tubular pores; 40 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 10 inches thick)

Bk1—17 to 24 inches; light brownish gray (10YR 6/2) very gravelly loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; common very fine tubular pores; 40 percent pebbles; violently effervescent; common fine and medium lime filaments; thin lime coatings on pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (7 to 18 inches thick)

Bk2—24 to 60 inches; light brownish gray (10YR 6/2) very gravelly loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine and few fine tubular pores; 55 percent pebbles; strongly effervescent; common fine lime filaments; thin lime coatings on pebbles; moderately alkaline (pH 8.2).

Type location: Pershing County, Nevada; near Star Peak, about 10 miles south of Imlay, about 100 feet north and 1,700 feet west of the southeast corner of sec. 29, T. 31 N., R. 34 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; moist from late fall through early summer, dry from late July through September
Soil temperature: 41 to 45 degrees F
Average soil temperature in summer: 54 to 59 degrees F
Mollic epipedon: 16 to 30 inches thick; includes the upper part of the Bk horizon in some pedons

Depth to bedrock: More than 60 inches

Control section: Content of clay—12 to 18 percent; content of rock fragments—40 to 60 percent, mainly pebbles

Calcium carbonate equivalent: 15 to 35 percent

A horizon:
Value—4 or 5 dry
Chroma—2 or 3

Bk horizon:
Value—5 or 6 dry, 3 or 4 moist (the darker value in the upper part of the horizon)
Chroma—2 to 4
Texture—very gravelly loam or very gravelly silty loam

Polum Variant

The Polum Variant consists of moderately deep, well drained, moderately permeable soils that formed in residuum weathered from limestone, dolomite, and calcareous shale. Polum Variant soils are on crests of mountains. Slopes are 4 to 15 percent. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 41 degrees F.

Taxonomic class: Loamy-skeletal, mixed Calcid Cryoborolls

Typical pedon: Polum Variant extremely gravelly loam, 4 to 15 percent slopes, in an area of Polum-Dekoom-Polum Variant association where pebbles cover about 80 percent, cobbles 5 percent, and stones 3 percent of the surface:

A1—0 to 2 inches; grayish brown (10YR 5/2) extremely gravelly loam, very dark gray (10YR 3/1) moist; weak thin platy structure; soft, very friable, nonsticky and slightly plastic; few very fine roots; many very fine tubular pores; 65 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (1 to 5 inches thick)

A2—2 to 10 inches; brown (10YR 5/3) very gravelly silt loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, nonsticky and slightly plastic; many very fine and few fine roots; many very fine tubular pores; 40 percent pebbles; strongly effervescent; thin lime coatings on the underside of pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 9 inches thick)

Bk—10 to 23 inches; pale brown (10YR 6/3) very gravelly silt loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine tubular pores; 40 percent pebbles, 5 percent cobbles; strongly effervescent; thin lime coatings on all sides of rock fragments; moderately alkaline (pH 8.4); abrupt smooth boundary. (12 to 20 inches thick)

R—23 inches; limestone.

Type location: Pershing County, Nevada; near Star Peak, about 10 miles south of Imlay, about 2,200 feet north and 350 feet east of the southwest corner of sec. 28, T. 31 N., R. 34 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; moist from late fall through early summer, dry from late July through September

Soil temperature: 41 to 45 degrees F
Average soil temperature in summer: 54 to 59 degrees F

Mollic epipedon: 7 to 12 inches thick

Depth to bedrock: 20 to 30 inches

Control section: Texture—loam or silt loam; content of rock fragments—35 to 60 percent, mostly pebbles; calcium carbonate equivalent—20 to 35 percent; reaction—moderately alkaline or strongly alkaline, becoming more alkaline with depth

Preble Series

The Preble series consists of very deep, somewhat poorly drained, slowly permeable soils that formed in alluvium derived from mixed rock sources and in lake sediments somewhat influenced by pyroclastic material. Preble soils are on alluvial flats. Slopes are 0 to 2 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Coarse-loamy, mixed (calcereous), mesic Aridic Durothric Torriorthents

Typical pedon: Preble silt loam, strongly saline-sodic:

A—0 to 4 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 5 inches thick)

C1—4 to 8 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 6 inches thick)

C2—8 to 14 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very...
fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (3 to 8 inches thick)

Cq1—14 to 22 inches; very pale brown (10YR 7/3) very fine sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine and fine roots; common very fine tubular pores; 25 percent hard, firm durinodes; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (6 to 10 inches thick)

Cq2—22 to 34 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; few very fine and fine roots; common very fine tubular pores; weak silica cementation; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (10 to 16 inches thick)

Cq3—34 to 42 inches; very pale brown (10YR 7/3) fine sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 25 percent hard, firm durinodes; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (7 to 16 inches thick)

C’—42 to 60 inches; light gray (10YR 7/2) sandy clay loam, pale brown (10YR 6/3) moist; few fine distinct dark brown (7.5YR 4/4) mottles; massive; slightly hard, friable, sticky and plastic; violently effervescent; moderately alkaline (pH 8.0).

Type location: Pershing County, Nevada; about 14 miles south of Winnemucca, in Grass Valley, about 100 feet south and 300 feet east of the northwest corner of sec. 11, T. 33 N., R. 37 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; moist in winter and spring, dry from July through October

Soil temperature: 47 to 52 degrees F

Depth to a weakly cemented horizon: 8 to 14 inches

Control section: Content of clay—8 to 15 percent; texture—very fine sandy loam or fine sandy loam

A horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Reaction—moderately alkaline or strongly alkaline

C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Reaction—moderately alkaline to very strongly alkaline

Cementation—weakly silica-cemented in the upper part of the Cq horizon; 20 to 75 percent durinodes in subhorizons

Other features—a substratum of sandy clay loam below a depth of 40 inches in some pedons

Preble Variant

The Preble Variant consists of very deep, somewhat poorly drained, moderately slowly permeable soils that formed in alluvium derived from mixed sources and somewhat influenced by loess high in content of volcanic ash. Preble Variant soils are in seep areas along a fault line on fan aprons. Slopes are 2 to 8 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is about 48 degrees F.

Taxonomic class: Fine-loamy, mixed (calcareous), mesic Aquic Durothric Torriorthents

Typical pedon: Preble Variant very fine sandy loam, 2 to 8 percent slopes, in an area of Preble Variant-Whirlo association where pebbles cover about 7 percent of the surface:

A—0 to 5 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; strong medium and thick platy structure parting to moderate very thin platy; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and common fine vesicular and few very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (3 to 7 inches thick)

C1—5 to 12 inches; very pale brown (10YR 7/3) sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium roots; common very fine and few fine tubular pores; 5 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (5 to 12 inches thick)

C2—12 to 17 inches; very pale brown (10YR 7/3) sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine, few fine, and few medium roots; many very fine tubular pores; 3 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (3 to 20 inches thick)

Cq1—17 to 28 inches; light gray (10YR 7/2) sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; few very fine
tubular pores; 2 percent pebbles; 10 percent durinodes; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (9 to 15 inches thick)

Cq2—28 to 33 inches; very pale brown (10YR 7/3) sandy clay loam, brown (10YR 4/3) moist; massive; hard, firm, sticky and slightly plastic; few very fine and fine roots; many very fine, common fine, and few medium tubular pores; 10 percent pebbles; 40 percent 5- to 10-millimeter durinodes; weak, continuous silica cementation; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (3 to 7 inches thick)

Cqk1—33 to 39 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; common very fine and few fine and medium tubular pores; 15 percent pebbles; few fine lime filaments; weak, continuous silica cementation; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (4 to 8 inches thick)

Cqk2—39 to 47 inches; brownish yellow (10YR 6/6) sandy clay loam, dark yellowish brown (10YR 4/4) moist; few fine reddish yellow (7.5YR 6/6) mottles; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; many very fine tubular pores; 10 percent pebbles; 20 percent strongly cemented durinodes; few fine lime filaments; weak, continuous silica cementation; slightly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (7 to 11 inches thick)

Cq3—47 to 60 inches; very pale brown (10YR 7/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; many large reddish yellow (7.5YR 6/6) mottles and many large black (10YR 2/1) manganese stains; massive; hard, firm, sticky and plastic; few very fine roots; common very fine and few fine tubular pores; 20 percent pebbles, 2 percent cobbles; few fine lime filaments; weak, continuous silica cementation; slightly effervescent; strongly alkaline (pH 9.0).

Type location: Pershing County, Nevada; in Jersey Valley, about 1,600 feet south and 2,500 feet west of the northeast corner of sec. 29, T. 27 N., R. 40 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; moist in winter and spring, dry from July through October

Soil temperature: 47 to 52 degrees F

Control section: Texture—sandy loam or sandy clay loam that has 5 to 20 percent pebbles; cementation—weak, continuous silica cementation in some part of the control section

Reaction throughout the profile: Strongly alkaline or very strongly alkaline

Salinity: Nonsaline in the upper part of the profile to moderately saline in the lower part

**Puffer Series**

The Puffer series consists of shallow, well drained, moderately rapidly permeable soils that formed in residuum weathered from limestone. Puffer soils are on side slopes of mountains and foothills. Slopes are 4 to 75 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Xeric Torriorthents

**Typical pedon:** Puffer very cobbly loam, 30 to 50 percent slopes, in an area of Findout-Puffer-Rock outcrop association where pebbles cover about 25 percent, cobbles 30 percent, and stones 5 percent of the surface:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 25 percent pebbles, 30 percent cobbles, 5 percent stones; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 3 inches thick)

A2—2 to 4 inches; light brownish gray (10YR 6/2) gravelly very fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; common very fine and few coarse roots; common very fine tubular pores; 25 percent pebbles, 5 percent stones; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 3 inches thick)

Bk—4 to 11 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few coarse roots; common very fine tubular pores; 40 percent pebbles, 5 percent cobbles, 5 percent stones; very thin lime coatings on all sides of rock fragments; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (2 to 10 inches thick)

R—11 inches; limestone; weathered in the uppermost 1 inch in places.
Type location: Pershing County, Nevada; in the Augusta Mountains, about 750 feet west and 500 feet north of the southeast corner of sec. 15, T. 25 N., R. 39 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 52 degrees F
Depth to bedrock: 4 to 14 inches
Control section: Content of clay—10 to 18 percent; content of rock fragments—45 to 75 percent, including pebbles and channery fragments (30 to 60 percent) and flagstones and cobbles (10 to 25 percent)
Reaction throughout the profile: Mildly alkaline or moderately alkaline
Calcium carbonate equivalent: 5 to 15 percent
Effervescence: Strongly effervescent or violently effervescent

A horizon:
Value—4 to 6 dry, 2 to 4 moist (dark colors related mainly to the parent material)
Chroma—1 to 3
Structure—subangular blocky or platy

B horizon:
Hue—10YR or 7.5YR
Value—4 to 6 dry, 2 to 4 moist (dark colors related mainly to the parent material)
Chroma—2 to 4
Texture (the fraction less than 2 millimeters in size)—fine sandy loam, loam, or sandy loam
Content of rock fragments—35 to 70 percent, dominated by pebbles and channery fragments
Structure—subangular blocky; massive in some pedons

Pumper Series

The Pumper series consists of very deep, somewhat excessively drained, moderately permeable soils that formed in loess high in content of volcanic ash over alluvium derived from mixed rock sources. Pumper soils are on fan skirts. Slopes are 0 to 2 percent. The mean annual precipitation is about 6 inches, and the mean annual temperature is about 49 degrees F.

Taxonomic class: Sandy-skeletal, mixed, mesic Camborthids

Typical pedon: Pumper loam:
A—0 to 3 inches; very pale brown (10YR 7/3) loam, grayish brown (10YR 5/2) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; few very fine roots; many medium and fine vesicular pores; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 6 inches thick)
Bw—3 to 12 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; many fine roots; many very fine interstitial pores; strongly alkaline (pH 9.0); clear smooth boundary. (6 to 19 inches thick)
2Bk1—12 to 17 inches; light brownish gray (10YR 6/2) extremely gravelly loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 65 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (0 to 19 inches thick)
3Bk2—17 to 23 inches; pale brown (10YR 6/3) very gravelly sand, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 55 percent pebbles; many lime coatings on the underside of pebbles; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 9 inches thick)
3C—23 to 60 inches; light brownish gray (10YR 6/2) extremely gravelly sand, very dark grayish brown (10YR 3/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine and few medium interstitial pores; 70 percent pebbles; violently effervescent; strongly alkaline (pH 8.6).

Type location: Pershing County, Nevada; about 20 miles south of Winnemucca, about 500 feet south and 500 feet east of the west quarter corner of sec. 21, T. 33 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 53 degrees F
Control section: Content of clay—0 to 10 percent; texture—averages very gravelly sand or extremely gravelly sand; content of rock fragments—50 to 80 percent, mainly pebbles
Depth to the 2Bk horizon: 11 to 24 inches

A horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Structure—weak or moderate, thin to thick platy; massive in some pedons
Consistence—soft or slightly hard
Reaction—mildly alkaline to strongly alkaline
Other features—because of recharge from dust, slightly effervescent in some pedons
Bw horizon:
Hue—10YR or 2.5Y
Value—5 to 7 dry, 3 or 4 moist (5 dry and 3 moist because of dark colored sand grains)
Chroma—2 or 3
Texture—commonly loam but includes very fine sandy loam, silt loam, fine sandy loam, and sandy loam
Structure—weak medium or coarse subangular blocky or prismatic
Reaction—mildly alkaline to strongly alkaline

2Bk1, 3Bk2, and 3C horizons:
Hue—10YR or 2.5Y
Value—4 to 8 dry, 3 to 6 moist
Chroma—1 to 3
Texture—stratified very gravelly sand to extremely gravelly coarse sand
Reaction—moderately alkaline or strongly alkaline
Carbonates—very thin coatings on at least the underside of rock fragments; few or common soft lime masses in some pedons

Raglan Series

The Raglan series consists of very deep, well drained, moderately slowly permeable soils that formed in alluvium derived from mixed rock sources. Raglan soils are on alluvial flat remnants. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Fine-loamy, mixed, mesic Duric Camborthids

Typical pedon: Raglan silt loam, moderately saline-sodic:
A1—0 to 4 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; strong thin platy structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine roots; many very fine and few medium vesicular pores; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 5 inches thick)
A2—4 to 7 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine and fine roots; common fine vesicular pores; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 5 inches thick)
Bw—7 to 13 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine and few fine and medium roots; few very fine tubular pores; slightly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (5 to 12 inches thick)
Bqk1—13 to 21 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; 20 percent durinodes; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (7 to 10 inches thick)
Bqk2—21 to 26 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and slightly plastic; common very fine roots; few very fine tubular pores; 60 percent durinodes; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (5 to 12 inches thick)

2Bk—26 to 35 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; few fine distinct dark brown (7.5YR 4/4) relict mottles; massive; hard, friable, nonsticky and plastic; few very fine roots; common very fine tubular pores; few fine lime seams; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (7 to 12 inches thick)

3C—35 to 60 inches; light gray (2.5Y 7/2) very fine sandy loam, grayish brown (2.5Y 5/2) moist; common medium distinct dark brown (7.5YR 4/4) relict mottles; massive; soft, very friable, nonsticky and nonplastic; common very fine interstitial pores; 5 percent pebbles; slightly effervescent; strongly alkaline (pH 9.0).

Type location: Pershing County, Nevada; about 16 miles south of Winnemucca, in Grass Valley, about 700 feet east and 1,400 feet north of the southwest corner of sec. 16, T. 33 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; intermittently moist in winter and spring

Soil temperature: 47 to 52 degrees F

Depth to the Bqk horizon: 10 to 20 inches

Control section: Content of clay—18 to 25 percent;
texture—loam, silt loam, very fine sandy loam, clay loam, or silty clay loam (averages silt loam having more than 15 percent sand coarser than very fine sand)

Color throughout the profile: Hue of 10YR or 2.5Y; value of 6 or 7 dry, 4 or 5 moist; and chroma of 2 to 4

Reaction throughout the profile: Mildly alkaline to very strongly alkaline, generally becoming more alkaline with depth
Salt and sodium: Generally not affected or slightly saline-sodic affected to a depth of 10 to 20 inches and slightly to strongly saline-sodic affected in the lower part of the profile; moderately or strongly saline-sodic affected phases in some areas

Other features: Mixed mineralogy that is strongly influenced by volcanic ash

A horizon:
Structure—weak to strong, thin to thick platy; granular or massive in some pedons
Consistency—soft or slightly hard
Effervescence—noneffervescent to strongly effervescent

Bw horizon:
Structure—fine to coarse, platy, prismatic, or subangular blocky
Effervescence—noneffervescent to strongly effervescent

Bqk1 and Bqk2 horizons:
Durinodes—20 to 80 percent; as much as 40 percent weak, discontinuous silica cementation commonly in any subhorizon having durinodes; hard or very hard, firm or very firm, brittle durinodes
Consistency—soft to hard, very friable or friable in the matrix

2Bk and 3C horizons:
Hue—2.5Y or 5Y
Structure—platy; massive in some pedons
Effervescence—strongly effervescent or violently effervescent

Other features—lacustrine material with hue of 2.5Y or 5Y and relic mottles with iron stains that have reddish hue (7.5YR or 5YR) and high chroma (4 to 6) below a depth of 24 inches in some pedons; unrelated very hard, basaltic dikes below a depth of 36 inches in a few pedons

Ragtown Series

The Ragtown series consists of very deep, moderately well drained, slowly permeable soils that formed in moderately fine textured and fine textured lacustrine material derived from mixed rock sources. Ragtown soils are on lake plain terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 53 degrees F.

Taxonomic class: Fine, montmorillonitic (calcareous), mesic Typic Torriorthents

Typical pedon: Ragtown fine sandy loam, 0 to 2 percent slopes, in an area of Slaw-Ragtown association:

A—0 to 7 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine vesicular pores; slightly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (5 to 10 inches thick)

C1—7 to 13 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, sticky and plastic; few very fine roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (3 to 8 inches thick)

C2—13 to 20 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, sticky and plastic; few very fine roots; common very fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (7 to 15 inches thick)

C3—20 to 33 inches; very pale brown (10YR 7/3) silty clay, brown (10YR 5/3) moist; massive; hard, firm, very sticky and very plastic; few very fine, fine, and medium tubular pores; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary. (11 to 15 inches thick)

C4—33 to 43 inches; light gray (10YR 7/2) silty clay loam, grayish brown (10YR 5/2) moist; massive; slightly hard, friable, very sticky and very plastic; common very fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary. (8 to 12 inches thick)

C5—43 to 65 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, sticky and plastic; few very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0).

Type location: Pershing County, Nevada; on the west side of Dixie Valley, about 300 feet west and 800 feet north of the southeast corner of sec. 28, T. 25 N., R. 37 E.

Range in Characteristics

Soil moisture: Usually dry; intermittently moist for short periods in winter and spring

Soil temperature: 53 to 57 degrees F

Depth to fine textured material: 16 to 30 inches

Control section: Content of clay—average of 35 to 45 percent, 25 to 35 percent in the upper part and more than 35 percent in the lower part; texture—stratified clay loam and sandy clay loam in the
upper part and stratified clay, silty clay, and silty clay loam in the lower part

Reaction throughout the profile: Moderately alkaline to very strongly alkaline (very strongly alkaline generally in strongly saline-sodic affected areas)

Effervescence: Slightly effervescent to violently effervescent

A horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5, 6, or 7 dry, 3, 4, or 5 moist
Chroma—2, 3, or 4
Structure—platy or subangular blocky

C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—6 or 7 dry, 4, 5, or 6 moist
Chroma—2 or 3
Structure—platy, subangular blocky, or prismatic; massive in some pedons
Secondary carbonates—common in any subhorizon
Relict mottles—typically in any subhorizon but not diagnostic for the series
Other features—a Ck horizon that has secondary carbonates in some pedons

Rebel Series

The Rebel series consists of very deep, well drained, moderately rapidly permeable soils that formed in alluvium derived from mixed rock sources. Rebel soils are on inset fans. Slopes are 0 to 4 percent. The mean annual precipitation is about 8 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Coarse-loamy, mixed, mesic Xerollic Camborthids

Typical pedon: Rebel loam, 0 to 2 percent slopes:
A1—0 to 4 inches; yellowish brown (10YR 5/4) loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular and vesicular pores; 3 percent pebbles; slightly effervescent; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 5 inches thick)
A2—4 to 7 inches; brown (10YR 5/3) loam, dark yellowish brown (10YR 4/4) moist; moderate thin and medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine tubular pores; 1 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 4 inches thick)
Bw1—7 to 13 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; few very fine tubular pores; 1 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (7 to 10 inches thick)
Bw2—13 to 18 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; many very fine and few fine tubular pores; 2 percent pebbles; moderately alkaline (pH 8.2); gradual smooth boundary. (3 to 9 inches thick)
C—18 to 36 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine and medium roots; common very fine tubular pores; 2 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary. (15 to 30 inches thick)
Ck—36 to 60 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine and common fine and medium roots; common very fine tubular pores; 10 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8).

Type location: Pershing County, Nevada; in Jersey Valley, about 2,200 feet east and 2,180 feet south of the northwest corner of sec. 4, T. 27 N., R. 40 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 52 degrees F
Combined thickness of the A and Bw horizons: 15 to 24 inches

Control section: Content of clay—10 to 18 percent; content of sand—50 to 80 percent; texture—commonly fine sandy loam but sandy loam or loam in some pedons
Depth to lime: 15 to 24 inches
Other features: Common or many mica flakes in a major part of the particle-size control section

A horizon:
Value—5 or 6 dry, 3 or 4 moist
Reaction—neutral or mildly alkaline
Other features—because of recharge from calcareous dust, slightly effervescent in some pedons

Bw horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Reaction—neutral to moderately alkaline

C horizon:
- Hue—10YR or 2.5Y
- Value—5 to 7 dry, 4 or 5 moist
- Chroma—2 to 4
- Content of rock fragments—strata that have as much as 50 percent pebbles in some pedons
- Effervescence—slightly effervescent to strongly effervescent
- Reaction—mildly alkaline to strongly alkaline
- Other features—subhorizons of coarse sandy loam in some pedons

**Reluctan Series**

The Reluctan series consists of moderately deep, well drained, moderately slowly permeable soils that formed in residuum and colluvium weathered from rhyolite and other extrusive rocks. Reluctan soils are on side slopes of mountains. Slopes are 15 to 50 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Aridic Argixerolls

**Typical pedon:** Reluctan gravelly loam, 30 to 50 percent slopes, in an area of Roca-Reluctan-Sumya association:

- **A1**—0 to 2 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; few very fine vesicular pores; 25 percent pebbles, 5 percent cobbles, 1 percent stones; mildly alkaline (pH 7.4); clear smooth boundary. (1 to 3 inches thick)

- **A2**—2 to 5 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (2 to 5 inches thick)

- **A3**—5 to 9 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 15 percent pebbles; mildly alkaline (pH 7.4); gradual smooth boundary. (3 to 9 inches thick)

- **Bt1**—9 to 16 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; common thin clay films on faces of ped and lining pores; 15 percent pebbles; mildly alkaline (pH 7.6); gradual smooth boundary. (2 to 10 inches thick)

- **Bt2**—16 to 25 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; common thin clay films on faces of ped and lining pores; 15 percent pebbles; mildly alkaline (pH 7.6); abrupt smooth boundary. 2R—25 inches; andesite.

**Type location:** Pershing County, Nevada; in the Tobin Range, about 2,400 feet north and 1,500 feet west of the southeast corner of sec. 34, T. 28 N., R. 39 E.

**Range in Characteristics**

- **Soil moisture:** Usually moist during the growing season; moist in winter and spring, dry from July through October
- **Soil temperature:** 44 to 47 degrees F
- **Mollic epipedon:** 7 to 17 inches thick; commonly includes the upper part of the argillic horizon
- **Thickness of the solum:** 20 to 40 inches
- **Depth to bedrock:** 20 to 40 inches

**A horizon:**
- Value—4 or 5 dry
- Chroma—2 or 3
- Reaction—neutral or mildly alkaline

**Bt horizon:**
- Value—5 or 6 dry, 3 or 4 moist
- Chroma—3 or 4
- Texture—gravelly loam or gravelly clay loam
- Content of clay—25 to 35 percent
- Content of rock fragments—15 to 35 percent, mainly pebbles
- Reaction—neutral or mildly alkaline, becoming more alkaline with depth

**Reluctan Variant**

The Reluctan Variant consists of very deep, well drained, moderately slowly permeable soils that formed in residuum and colluvium weathered from chert, argillite, shale, and other siliceous rocks. Reluctan Variant soils are on side slopes of mountains. Slopes are 30 to 75 percent. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Xerolic Haplargids
Typical pedon: Reluctan Variant gravelly silt loam, 30 to 50 percent slopes, in an area of Roca-Reluctan Variant association, steep, where pebbles cover about 25 percent and cobbles 2 percent of the surface:
A1—0 to 3 inches; pale brown (10YR 6/3) gravelly silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine and common fine vesicular pores; 15 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary. (1 to 4 inches thick)
A2—3 to 6 inches; brown (10YR 5/3) gravelly silt loam, very dark brown (10YR 3/3) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; common very fine tubular pores; 15 percent pebbles; neutral (pH 7.2); clear smooth boundary. (2 to 4 inches thick)
AB—6 to 12 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine and few fine roots; common very fine tubular pores; 20 percent pebbles; few thin clay films on faces of peds and lining pores; neutral (pH 7.2); clear smooth boundary. (5 to 8 inches thick)
Bt—12 to 24 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and few fine roots; common very fine and few fine roots; common very fine tubular pores; 20 percent pebbles; few thin clay films on faces of peds and lining pores; neutral (pH 7.2); clear smooth boundary. (10 to 15 inches thick)
Btk1—24 to 34 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and few fine roots; common very fine tubular pores; 30 percent pebbles; few thin clay films on faces of peds and lining pores; neutral (pH 7.2); clear smooth boundary. (9 to 13 inches thick)
Btk2—34 to 46 inches; pale brown (10YR 6/3) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; common very fine tubular pores; 45 percent pebbles, 10 percent cobbles; many medium lime filaments; common thin clay films on faces of peds and lining pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (12 to 20 inches thick)
Btk3—40 to 60 inches; brownish yellow (10YR 6/6) very gravelly clay loam, yellowish brown (10YR 5/6) moist; weak fine subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; few very fine tubular pores; 35 percent pebbles, 5 percent cobbles; common fine lime filaments; many thin clay films on faces of peds and lining pores; slightly effervescent; moderately alkaline (pH 8.4).
Type location: Pershing County, Nevada; in the southern part of the Sonoma Range, about 300 feet north and 1,800 feet west of the southeast corner of sec. 16, T. 32 N., R. 39 E.

Range in Characteristics
Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 44 to 47 degrees F
Depth to bedrock: More than 60 inches
Argillic horizon: Content of clay—18 to 25 percent;
content of rock fragments—15 to 35 percent
Reaction: Neutral or mildly alkaline in the A and Bt horizons and moderately alkaline in the Btk horizon

Rezave Series

The Rezave series consists of shallow, well drained, slowly permeable soils that formed in residuum weathered from basalt. Rezave soils are on side slopes of plateaus. Slopes are 30 to 50 percent. The mean annual precipitation is about 6 inches, and the mean annual temperature is about 49 degrees F.
Taxonomic class: Clayey, montmorillonitic, mesic Lithic Natargids

Typical pedon: Rezave extremely stony very fine sandy loam, 30 to 50 percent slopes, in an area of Pirouette-Rezave-Rubble land association where pebbles cover about 25 percent, cobbles 10 percent, and stones 20 percent of the surface:
A—0 to 3 inches; light brownish gray (10YR 6/2) extremely stony very fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular and few very fine tubular pores; 10 percent pebbles, 20 percent cobbles, 20 percent stones; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 6 inches thick)
Btk—3 to 8 inches; brown (10YR 5/3) stony clay loam, dark brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 15 percent pebbles, 5 percent cobbles, 10 percent stones; many thin clay
films on faces of pedds and lining pores; strongly effervescent; strongly alkaline (pH 9.0); gradual smooth boundary. (4 to 10 inches thick)

Btk—8 to 14 inches; brown (7.5YR 5/4) stony clay, dark brown (7.5YR 4/4) moist; strong fine prismatic structure; hard, firm, very sticky and very plastic; common very fine and few fine roots; common very fine tubular pores; 15 percent pebbles, 5 percent cobbles, 10 percent stones, 10 percent pebble-sized duripan fragments; many moderately thick clay films lining pores and on faces of pedds; many medium soft lime masses; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 8 inches thick)

Bqk—14 to 16 inches; very pale brown (10YR 8/3) stony clay loam, very pale brown (10YR 7/3) moist; massive; hard, firm, sticky and plastic; few very fine roots; few fine tubular pores; 5 percent pebbles, 5 percent cobbles, 10 percent stones; strong, discontinuous silica and lime cementation; violently effervescent; very strongly alkaline (pH 9.2); abrupt smooth boundary. (0 to 5 inches thick)

R—16 inches; basalt.

**Type location:** Pershing County, Nevada; about 12 miles east of Lovelock, in the West Humboldt Range, about 250 feet west and 400 feet south of the northeast corner of sec. 23, T. 27 N., R. 33 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods in winter and spring

**Soil temperature:** 51 to 56 degrees F

**Depth to hard bedrock:** 14 to 20 inches

**Other features:** A thin E horizon between the A and Btk horizons in some pedons

**A horizon:**
- Value—6 or 7 dry, 3 or 4 moist
- Chroma—2, 3, or 4
- Reaction—neutral to moderately alkaline

**Btk horizon:**
- Hue—7.5YR or 10YR
- Value—4, 5, or 6 dry, 3 or 4 moist
- Chroma—3 or 4
- Texture—clay, clay loam, or stony clay
- Content of clay—35 to 55 percent
- Carbonates—slightly effervescent to violently effervescent; the underside of rock fragments commonly coated with lime
- Reaction—moderately alkaline or strongly alkaline

**Bqk horizon (not in all pedons):**
- Value—7 or 8 dry, 6 or 7 moist
- Chroma—1 to 4

**Cementation**—weak to strong, discontinuous silica and lime cementation

**Roca Series**

The Roca series consists of moderately deep, well drained, very slowly permeable soils that formed in residuum and colluvium derived from rhyolite, quartzite, chert, shale, and andesite. Roca soils are on south-facing side slopes of hills and mountains. Slopes are 30 to 75 percent. The mean annual precipitation is about 10 inches, and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Xerollic Haplargids

**Typical pedon:** Roca very cobbly loam, 30 to 50 percent slopes, in an area of Roca-Wiskan-Relucan association where pebbles cover about 20 percent, cobbles 10 percent, and stones 2 percent of the surface:

A1—0 to 2 inches; light brownish gray (2.5Y 6/2) very cobbly loam, dark grayish brown (2.5Y 4/2) moist; moderate thin and medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine vesicular and common fine tubular pores; 10 percent pebbles, 35 percent cobbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (1 to 4 inches thick)

A2—2 to 6 inches; light brownish gray (2.5Y 6/2) gravelly loam, dark grayish brown (2.5Y 4/2) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; common very fine and few fine roots; common fine interstitial and common very fine tubular pores; 25 percent pebbles, 1 percent cobbles; neutral (pH 7.2); abrupt wavy boundary. (3 to 6 inches thick)

Bt1—6 to 10 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 4/3) moist; moderate fine and medium angular blocky structure; hard, firm, sticky and plastic; common very fine and few fine roots; common very fine tubular pores; few thick clay films on faces of pedds; 25 percent pebbles, 2 percent cobbles; neutral (pH 7.0); clear wavy boundary. (3 to 8 inches thick)

Bt2—10 to 21 inches; pale brown (10YR 6/3) very gravelly clay, brown (10YR 4/3) moist; moderate medium and coarse angular blocky structure; hard, firm, sticky and plastic; common very fine and few fine roots; common very fine tubular pores; common moderately thick clay films on faces of pedds; 50 percent pebbles, 5 percent cobbles; mildly alkaline
(pH 7.6); clear wavy boundary. (6 to 14 inches thick)

Bt3—21 to 29 inches; light yellowish brown (10YR 6/4) very gravelly clay, brown (10YR 4/3) moist; moderate medium and coarse angular blocky structure; hard, firm, sticky and plastic; few very fine roots; common very fine tubular pores; many moderately thick clay films on faces of pedds; 45 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear wavy boundary. (6 to 14 inches thick)

Bt4—29 to 34 inches; light yellowish brown (10YR 6/4) very gravelly clay, brown (10YR 4/3) moist; moderate fine and medium angular blocky structure; hard, firm, very sticky and plastic; few fine and medium roots; few fine tubular pores; many moderately thick clay films on faces of pedds and rock fragments; 40 percent pebbles, 5 percent cobbles; neutral (pH 7.3); abrupt irregular boundary. (1 to 10 inches thick)

2R—34 inches; hard, fractured rhyolite.

Type location: Pershing County, Nevada; in the Humboldt Range, about 200 feet north and 1,820 feet west of the southeast corner of sec. 27, T. 29 N., R. 34 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 43 to 47 degrees F
Depth to bedrock: 20 to 40 inches

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3
Structure—granular or platy
Reaction—slightly acid to mildly alkaline

Bt horizon:
Hue—10YR or 7.5YR; 2.5Y in the lower part of the horizon in some pedons
Value—5 to 7 dry, 3 to 7 moist
Chroma—3 to 6
Texture—very gravelly clay or very gravelly clay loam
Content of clay—35 to 50 percent
Content of rock fragments—35 to 50 percent, mainly pebbles
Structure—moderate or strong, medium or fine, angular or subangular blocky
Reaction—neutral to moderately alkaline, generally becoming more alkaline with depth
Other features—secondary carbonates and violent effervescence in the lower part of the horizon in some pedons

Say Series

The Say series consists of moderately deep, well drained, moderately permeable soils that formed in residuum weathered from granite. Say soils are on side slopes of mountains. Slopes are 30 to 75 percent. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 43 degrees F.

Taxonomic class: Fine-loamy, mixed, frigid Aridic Argixerolls

Typical pedon: Say stony loam, 30 to 50 percent slopes, in an area of Gol-Say association where pebbles cover about 10 percent, cobbles 5 percent, and stones 3 percent of the surface:

A1—0 to 3 inches; brown (10YR 5/3) stony loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; common very fine vesicular pores; 9 percent pebbles, 2 percent cobbles, 1 percent stones; mildly alkaline (pH 7.4); clear smooth boundary. (3 to 5 inches thick)

A2—3 to 9 inches; brown (10YR 5/3) cobble loam, dark brown (10YR 3/3) moist; weak very thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine tubular pores; 7 percent pebbles, 15 percent cobbles, 1 percent stones; mildly alkaline (pH 7.4); clear smooth boundary. (4 to 6 inches thick)

BA—9 to 12 inches; yellowish brown (10YR 5/4) cobble loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine tubular pores; 6 percent pebbles, 20 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary. (0 to 6 inches thick)

Bt—12 to 19 inches; yellowish brown (10YR 5/4) cobble loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine and fine tubular pores; few thin clay films on faces of pedds and lining pores; 8 percent pebbles, 10 percent cobbles; neutral (pH 7.2); clear smooth boundary. (7 to 17 inches thick)

C—19 to 25 inches; yellowish brown (10YR 5/4) gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and few medium roots; few fine and very fine
tubular pores; 20 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary. (1 to 10 inches thick)
Cr—25 inches; weathered granite.

**Type location:** Pershing County, Nevada; in the southern part of the East Range, about 200 feet south and 300 feet west of the northeast corner of sec. 22, T. 28 N., R. 37 E.

**Range in Characteristics**

**Soil moisture:** Usually moist during the growing season; moist in winter and spring, dry from July through October

**Soil temperature:** 43 to 47 degrees F

**Mollic epipedon:** 7 to 12 inches thick

**Thickness of the solum:** 19 to 32 inches

**Depth to paralithic contact:** 20 to 40 inches

**Control section:** Content of clay—18 to 25 percent; content of rock fragments—15 to 35 percent

**Reaction throughout the profile:** Neutral or mildly alkaline

**Other features:** Noncalcareous throughout the profile; a thin BA horizon in most pedons

A horizon:
Chroma—2 or 3

Bt horizon:
Value—5 or 6 dry, 3 or 4 moist
Texture—gravelly loam, gravelly sandy clay loam, cobbly loam, or cobbly sandy clay loam
Content of sand—more than 45 percent
Reaction—neutral or mildly alkaline

C horizon:
Value—5 or 6 dry, 3 or 4 moist
Texture—gravelly sandy loam, gravelly loamy sand, very gravelly sandy loam, or very gravelly loamy sand
Content of clay—4 to 15 percent
Content of rock fragments—20 to 50, dominantly pebbles
Consistence—slightly hard or loose
Other features—discontinuous in some pedons

**Schamp Series**

The Schamp series consists of very deep, well drained, moderately slowly permeable soils that formed in alluvium and colluvium derived from tuff, andesite, and basalt and mixed with volcanic ash. Schamp soils are on side slopes of foothills. Slopes are 15 to 30 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Xerolic Haplargids

**Typical pedon:** Schamp loam, 15 to 30 percent slopes, in an area of Bojo Variant-Schamp-Trunk association where pebbles cover about 20 percent of the surface:

A1—0 to 3 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and fine vesicular pores; 10 percent pebbles, 2 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 5 inches thick)

A2—3 to 6 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 10 percent pebbles, 2 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary. (2 to 5 inches thick)

Bt1—6 to 13 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and few fine and medium roots; common very fine tubular pores; common thin clay films on faces of peds and lining pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (5 to 9 inches thick)

Bt2—13 to 28 inches; light brown (7.5YR 6/4) clay, brown (7.5YR 4/4) moist; moderate fine prismatic structure; hard, firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; continuous, thin clay films on faces of peds; 5 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary. (10 to 20 inches thick)

Btk—28 to 34 inches; light brown (7.5YR 6/4) clay, brown (7.5YR 4/4) moist; moderate fine prismatic structure; hard, firm, very sticky and very plastic; common very fine roots; few very fine tubular pores; continuous, thin clay films on faces of peds; 5 percent pebbles; strongly effervescent; common fine lime filaments; moderately alkaline (pH 8.4); clear smooth boundary. (4 to 10 inches thick)

2Bk—34 to 60 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 20 percent cobbles, 20 percent pebbles; strongly effervescent; common fine lime filaments; strongly alkaline (pH 8.6).

**Type location:** Pershing County, Nevada; near Golconda Pass, in the Tobin Range, about 2,000 feet south and 1,800 feet east of the northwest corner of sec. 16, T. 28 N., R. 40 E.
Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 50 degrees F
Depth to the base of the argillic horizon: 27 to 36 inches
Control section: Content of clay—35 to 60 percent; reaction—neutral or mildly alkaline in the upper part, moderately alkaline or strongly alkaline in the lower part

A horizon:
Value—5 or 6 dry, 3 or 4 moist; more than 5.5 dry and 3.5 moist when the uppermost 7 inches is mixed
Chroma—2 or 3
Structure—weak or moderate, thin to thick platy; granular in some pedons
Consistency—soft or slightly hard

Bt horizon:
Hue—10YR or 7.5YR
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 to 4
Texture—clay or clay loam
Content of clay—35 to 60 percent
Content of rock fragments—as much as 25 percent pebbles in any one subhorizon
Structure—fine to coarse prismatic or moderate or strong, fine to coarse subangular or angular blocky
Thickness of the argillic horizon—24 to 32 inches
Carbonates—none effervescent in the upper part of the horizon and effervescent in the lower part; few to many fine to coarse lime segregations

Bk horizon:
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 or 3
Texture—sandy loam, sandy clay loam, or very cobbly loam
Content of clay—10 to 25 percent
Content of rock fragments—15 to 80 percent, mainly cobbles and stones, generally increasing in amount with depth
Reaction—strongly alkaline or very strongly alkaline
Secondary carbonates—rock fragments generally coated at least on their underside

Shabliss Series

The Shabliss series consists of shallow, well drained, moderately permeable soils that formed in alluvium derived from mixed rock sources and in a mantle of loess high in content of volcanic ash. Shabliss soils are on partial ballenas and fan piedmont remnants. Slopes are 2 to 50 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Loamy, mixed, mesic, shallow Hapludolleric Durotholds

Typical pedon: Shabliss gravelly loam, 30 to 50 percent slopes, in an area of Eastwell-Shabliss-Blackhawk association where pebbles cover about 25 percent and cobbles 5 percent of the surface:
A—0 to 3 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; strong thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and few fine vesicular and few very fine tubular pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 5 inches thick)
Bw—3 to 15 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine tubular pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (7 to 13 inches thick)
Bqk—15 to 19 inches; very pale brown (10YR 7/3) gravelly loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 10 percent pebbles; 5 percent durinodes; violently effervescent; coatings of lime on pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary. (0 to 6 inches thick)
Bqkm—19 to 30 inches; very pale brown (10YR 8/3), strongly cemented duripan, very pale brown (10YR 7/3) moist; massive; very hard, very firm; common very fine and few fine roots in fractures; discontinuous silica laminae; 50 percent pebbles, 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (10 to 20 inches thick)
2CK—30 to 60 inches; light gray (10YR 7/2) very gravelly loamy sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; common very fine roots; many fine interstitial pores; 30 percent pebbles, 5 percent cobbles; strongly effervescent; thin lime coatings on rock fragments; strongly alkaline (pH 8.8).

Type location: Pershing County, Nevada; about 3 miles southwest of Imlay, about 300 feet south and 1,500 feet west of the northeast corner of sec. 20, T. 32 N., R. 34 E.
Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 55 degrees F
Depth to the base of the Bw horizon: 10 to 15 inches
Depth to a strongly cemented durpan: 10 to 20 inches
Control section: Content of clay—5 to 15 percent;
texture—averages very fine sandy loam, silt loam,
or loam that has thin strata of fine sandy loam in
some pedons
Reaction throughout the profile: Neutral to strongly
alkaline

A horizon:
Value—5 or 6 dry, 3 or 4 moist
Chroma—2 or 3
Reaction—neutral to moderately alkaline

Bw horizon:
Value—5 or 6 dry
Chroma—2 to 4
Reaction—neutral to strongly alkaline

Bq or Bqk horizon (not in all pedons):
Cementation—5 to 45 percent durinodes in a friable
or brittle matrix

Bqkm horizon:
Structure—platy or massive
Consistence—very hard or extremely hard
Other features—two or more strongly cemented
layers interbedded with weakly cemented
material in some pedons

C horizon:
Content of clay—0 to 10 percent
Reaction—moderately alkaline to very strongly
alkaline
Cementation—in the Cqk horizon, which occurs in
some pedons, extremely hard, extremely firm,
brittle, ½- to ⅜-inch, cylindrical durinodes in a
friable or firm matrix or 5 to 45 percent weak,
continuous silica cementation
Other features—gravelly or very gravelly loamy
sand below the durpan in some pedons

Typical pedon: Singatse extremely cobbly loam, 50 to
75 percent slopes, in an area of Theon-Singatse-Rock
outcrop association where pebbles cover about 30
percent, cobbles 35 percent, and stones 15 percent of
the surface:

A—0 to 4 inches; pale brown (10YR 6/3) extremely
cobbly loam, brown (10YR 4/3) moist; moderate thin
platy structure; soft, very friable, slightly sticky and
slightly plastic; few very fine roots; common very
fine and fine vesicular pores; 35 percent pebbles,
35 percent cobbles; strongly effervescent;
mildly alkaline (pH 8.4); clear smooth
boundary. (2 to 5 inches thick)

C—4 to 8 inches; pale brown (10YR 6/3) very gravelly
loam, brown (10YR 4/3) moist; massive; slightly
hard, very friable, slightly sticky and slightly plastic;
few very fine roots; few very fine tubular pores; 45
percent pebbles; strongly effervescent; strongly
alkaline (pH 8.6); clear smooth boundary. (2 to 6
inches thick)

2R—8 inches; granite; weathered in parts of the upper
7 inches.

Type location: Pershing County, Nevada; in the
southern part of the Eugene Mountains, about 1,700
feet south and 2,200 feet east of the northwest
corner of sec. 27, T. 33 N., R. 33 E.

Range in Characteristics

Soil moisture: Usually dry; moist for short periods in
winter and spring
Soil temperature: 49 to 54 degrees F
Depth to lithic contact: 4 to 10 inches
Control section: Content of clay—5 to 15 percent;
content of rock fragments—35 to 60 percent, mostly
pebbles; texture—very gravelly loam or very
gravelly sandy loam
Reaction throughout the profile: Moderately alkaline or
strongly alkaline

A horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3

C horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3

Singatse Series

The Singatse series consists of very shallow,
somewhat excessively drained, moderately permeable
soils that formed in residuum and colluvium derived
from rhyolite, dacite, and granitic rocks. Singatse soils
are on side slopes of hills and mountains. Slopes are
30 to 75 percent. The mean annual precipitation is
about 5 inches, and the mean annual temperature is
about 50 degrees F.

Taxonomic class: Loamy-skeletal, mixed (calcareous),
mesic Lithic Torriorthents

Slaven Series

The Slaven series consists of moderately deep, well
drained, slowly permeable soils that formed in residuum
weathered from chert, shale, and quartzite and in a
small component of loess and volcanic ash. Slaven soils are on side slopes of hills and mountains. Slopes are 15 to 75 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Aridic Argixerolls

**Typical pedon:** Slaven very cobbly loam, 30 to 50 percent slopes, in an area of Slaven-Linrose-Iver association where pebbles cover about 25 percent, cobbles 20 percent, and stones 1 percent of the surface:

A1—0 to 5 inches; grayish brown (10YR 5/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; common very fine vesicular pores; 25 percent pebbles, 15 percent cobbles; neutral (pH 7.0); clear smooth boundary. (3 to 7 inches thick)

A2—5 to 10 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine tubular pores; 35 percent pebbles; neutral (pH 7.2); clear smooth boundary. (3 to 7 inches thick)

Bt1—10 to 15 inches; light yellowish brown (10YR 6/4) extremely gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and few coarse roots; many very fine and common fine tubular pores; common thin clay films on faces of ped and lining pores; 55 percent pebbles, 5 percent cobbles; neutral (pH 7.2); clear smooth boundary. (4 to 8 inches thick)

Bt2—15 to 25 inches; light brown (7.5YR 6/4) extremely gravelly clay, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; common very fine, fine, and coarse roots; common very fine and few fine tubular pores; continuous, thin clay films; 60 percent pebbles, 5 percent cobbles; neutral (pH 7.3); gradual smooth boundary. (8 to 12 inches thick)

Bt3—25 to 36 inches; light brown (7.5YR 6/4) extremely gravelly clay, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, firm, sticky and very plastic; few very fine, fine, and medium roots; few very fine tubular pores; continuous, thin clay films; 50 percent pebbles, 10 percent cobbles; neutral (pH 7.3); abrupt wavy boundary. (0 to 12 inches thick)

R—36 inches; chert.

**Type location:** Pershing County, Nevada; in the Tobin Range, about 800 feet north and 700 feet west of the southeast corner of sec. 6, T. 28 N., R. 40 E.

**Range in Characteristics**

- **Soil moisture:** Usually dry; moist in winter and spring
- **Soil temperature:** 44 to 47 degrees F
- **Mollic epipedon:** 7 to 12 inches thick; commonly includes the upper part of the argillic horizon
- **Depth to bedrock:** 20 to 40 inches
- **Reaction throughout the profile:** Slightly acid or neutral

**A horizon:**

- **Hue:** 10YR or 7.5YR
- **Value:** 5 or 6 dry (value of 6 only to a depth of 2 inches or less; value of less than 5.5 when the uppermost 7 inches is mixed)
- **Chroma:** 2 or 3
- **Structure:** weak or moderate, very fine or fine, subangular blocky, granular, or platy; massive in some pedons

**Bt horizon:**

- **Hue:** 10YR or 7.5YR
- **Value:** 4 to 6 dry, 3 to 5 moist
- **Chroma:** commonly 3 or 4; as high as 6 in some pedons
- **Texture:** clay, sandy clay, or clay loam
- **Content of clay:** 35 to 45 percent
- **Content of rock fragments:** average of 60 to 75 percent; ranging from 50 to 75 percent in the upper part of the horizon
- **Structure:** weak or moderate, fine or medium, angular or subangular blocky
- **Consistence:** hard or very hard, friable or firm

**Slaw Series**

The Slaw series consists of very deep, well drained, slowly permeable soils that formed in alluvium derived from mixed sources. Slaw soils are on lake plains. Slopes are 0 to 2 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 54 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Typic Torrileuvents

**Typical pedon:** Slaw silt loam, 0 to 2 percent slopes, in an area of Slaw-Ragtown association:

A1—0 to 3 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; strong very thin platy structure; soft, friable, slightly sticky and slightly plastic; few very fine roots; few very fine, fine, and medium vesicular pores; strongly effervescent;
strongly alkaline (pH 9.0); clear smooth boundary.
(1 to 6 inches thick)
A2—3 to 6 inches; pale brown (10YR 6/3) silty clay
loam, brown (10YR 4/3) moist; moderate very thin
platy structure; slightly hard, friable, sticky and
plastic; few very fine roots; common very fine and
few fine tubular pores; few vertical salt seams;
strongly effervescent; strongly alkaline (pH 9.0);
clear smooth boundary. (1 to 5 inches thick)
C1—6 to 10 inches; pale brown (10YR 6/3), finely
stratified silty clay loam on average, dark brown
(10YR 4/3) moist; massive; slightly hard, friable,
sticky and plastic; few very fine roots; few very fine
tubular pores; strongly effervescent; strongly
alkaline (pH 9.0); clear smooth boundary. (2 to 6
inches thick)
2C2—10 to 22 inches; pale brown (10YR 6/3), finely
stratified silty clay loam on average, dark brown
(10YR 4/3) moist; massive; slightly hard, friable,
sticky and plastic; few very fine roots; few very fine
tubular pores; strongly effervescent; very strongly
alkaline (pH 9.2); clear smooth boundary. (10 to 14
inches thick)
3C3—22 to 38 inches; very pale brown (10YR 7/3),
finely stratified silty clay loam on average, brown
(10YR 4/3) moist; massive; hard, friable, sticky and
plastic; few very fine roots; few very fine tubular
pores; strongly effervescent; very strongly alkaline
(pH 9.2); gradual smooth boundary. (10 to 20
inches thick)
3C4—38 to 51 inches; very pale brown (10YR 7/3),
finely stratified silty clay loam on average, brown
(10YR 4/3) moist; massive; hard, friable, sticky and
plastic; few very fine roots; few very fine tubular
pores; strongly effervescent; very strongly alkaline
(pH 9.2); gradual smooth boundary. (10 to 30
inches thick)
3C5—51 to 60 inches; very pale brown (10YR 7/3),
finely stratified silty clay loam on average, brown
(10YR 4/3) moist; massive; hard, friable, sticky and
plastic; few very fine roots; few very fine tubular
pores; strongly effervescent; very strongly alkaline
(pH 9.2).

Type location: Pershing County, Nevada; in the
northern part of Dixie Valley, about 800 feet south
and 1,400 feet east of the northwest corner of sec.
27, T. 25 N., R. 37 E.

Range in Characteristics

Soil moisture: Usually dry; moist in some part for short
periods in winter and early spring and for 10 to 20
cumulative days between July and October, the
result of convection storms

Soil temperature: 53 to 57 degrees F

Control section: Content of clay—18 to 35 percent;
texture—silty clay loam or silt loam
Calcium carbonate equivalent: 1 to 4 percent
Organic matter content: Decreases irregularly with depth

A horizon:
Value—6 or 7 dry, 4, 5, or 6 moist
Chroma—2, 3, or 4
Structure—platy, blocky, or granular
Reaction—strongly alkaline or very strongly alkaline
Effervescence—slightly effervescent to violently
effervescent

C horizon:
Value—6, 7, or 8 dry, 4, 5, or 6 moist
Chroma—2, 3, or 4
Structure—subangular blocky or platy; massive in
some pedons
Reaction—strongly alkaline or very strongly alkaline
Relict mottles—common in any subhorizon

Snapp Series

The Snapp series consists of very deep, well
drained, slowly permeable soils that formed in alluvium
weathered from mixed rock sources. Snapp soils are on
fan piedmont remnants and ballenas. Slopes are 2 to
30 percent. The mean annual precipitation is about 9
inches, and the mean annual temperature is about 48
degrees F.

Taxonomic class: Clayey over sandy or sandy-skeletal,
montmorillonitic, mesic Durixerolic Natargids

Typical pedon: Snapp gravelly very fine sandy loam, 2
to 8 percent slopes, in an area of Misad-Snapp-Oxocorel
association where pebbles cover about 50 percent and
cobbles 3 percent of the surface:

A1—0 to 5 inches; pale brown (10YR 6/3) gravelly very
fine sandy loam, brown (10YR 4/3) moist; moderate
very thin platy structure; soft, very friable, slightly
sticky and slightly plastic; many very fine roots;
many very fine vesicular pores; 20 percent pebbles;
moderately alkaline (pH 8.0); clear smooth
boundary. (1 to 6 inches thick)

A2—5 to 9 inches; pale brown (10YR 6/3) very fine
sandy loam, brown (10YR 4/3) moist; moderate very
thin platy structure; slightly hard, very friable,
slightly sticky and slightly plastic; common very fine
and few fine and medium roots; many very fine
tubular pores; 10 percent pebbles; moderately
alkaline (pH 8.0); clear smooth boundary. (1 to 5
inches thick)

Btv—9 to 15 inches; pale brown (10YR 6/3) clay loam,
brown (10YR 4/3) moist; moderate fine and medium
angular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; common very fine tubular pores; few thin clay films on faces of peds and lining pores; moderately alkaline (pH 8.2); clear smooth boundary. (0 to 10 inches thick)

Btk1—15 to 21 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; hard, firm, sticky and plastic; few very fine and fine roots; few very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 20 percent pebbles; few fine filaments and soft masses of lime; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (5 to 10 inches thick)

Btk2—21 to 28 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; hard, firm, sticky and plastic; few very fine roots; common very fine and few fine tubular pores; many moderately thick clay films on faces of peds and lining pores; 20 percent pebbles; strongly effervescent; common medium lime filaments; very strongly alkaline (pH 9.6); clear smooth boundary. (4 to 9 inches thick)

Bqky1—28 to 39 inches; light yellowish brown (10YR 6/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, sticky and plastic; few very fine roots; few very fine tubular pores; weak, continuous silica cementation; 35 percent pebbles; few fine gypsum masses and filaments; strongly effervescent; many fine, medium, and coarse masses and filaments of lime; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 10 inches thick)

Bqky2—39 to 51 inches; very pale brown (10YR 7/4) very gravelly loamy sand, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; common very fine tubular pores; 60 percent pebbles; few fine masses and filaments of gypsum; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 20 inches thick)

Bqk—51 to 60 inches; very pale brown (10YR 7/4) extremely gravelly loamy sand, yellowish brown (10YR 5/4) moist; massive; very hard, very firm, nonsticky and nonplastic; few very fine tubular pores; weak, discontinuous silica cementation; 70 percent pebbles; strongly effervescent; strongly alkaline (pH 8.5).

Type location: Pershing County, Nevada; in the southern part of Buffalo Valley, about 1,100 feet north and 1,500 feet east of the southwest corner of sec. 3, T. 28 N., R. 40 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; moist in winter and spring, dry from June through October

Soil temperature: 47 to 52 degrees F

Combined thickness of the A and Bt horizons: 20 to 30 inches

Depth to discontinuity: 20 to 40 inches

Depth to the Bqk horizon: 20 to 30 inches

Depth to segregated lime: 3 to 17 inches

Reaction throughout the profile: Moderately alkaline to very strongly alkaline

Other features: A C horizon below a depth of 3 feet in some pedons

A1 horizon:
Value—5 or 6 dry, 3 or 4 moist
Chroma—2, 3, or 4

Bt horizon:
Value—5 or 6 dry, 4 or 5 moist
Chroma—3 or 4
Texture—clay loam, gravelly clay loam, clay, or gravelly clay
Content of clay—35 to 60 percent
Content of rock fragments—5 to 35 percent, mainly pebbles
Structure—angular blocky or prismatic
Exchangeable sodium—15 to 25 percent

Bk horizon (not in all pedons):
Value—6 or 7 dry, 4 or 5 moist
Chroma—3, 4, or 5
Content of rock fragments—15 to 35 percent, mainly pebbles
Structure—subangular blocky; massive in some pedons

Bqk and 2Bqk horizons:
Value—6, 7, or 8 dry, 5, 6, or 7 moist
Chroma—3 to 6
Texture of the 2B horizon—very gravelly or extremely gravelly loamy sand or sand
Content of rock fragments—35 to 70 percent, mainly pebbles
Segregated gypsum—soft masses or filaments of gypsum commonly in any subhorizon
Silica cementation—weak, continuous silica cementation in subhorizons within a depth of 40 inches

Snowmore Series

The Snowmore series consists of moderately deep, well drained, moderately slowly permeable soils that formed in loess over residuum weathered from basalt.
Snowmore soils are on summits of hills and basalt plateaus. Slopes are 2 to 8 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Xerollic Durargids

**Typical pedon:** Snowmore very cobbly loam, 2 to 8 percent slopes, in an area of Alley-Snowmore-Rock outcrop association where pebbles cover about 15 percent, cobbles 15 percent, and stones 2 percent of the surface:

A1—0 to 2 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine and fine vesicular pores; 10 percent pebbles, 25 percent cobbles; slightly effervescent; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 4 inches thick)

A2—2 to 8 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine tubular pores; 15 percent pebbles, 20 percent cobbles; mildly alkaline (pH 7.8); clear smooth boundary. (0 to 6 inches thick)

Bt1—8 to 12 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and common fine roots; many very fine tubular pores; 5 percent pebbles, 5 percent cobbles; few thin clay films on faces of pebbles and lining pores; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 6 inches thick)

Bt2—12 to 16 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; few very fine roots; many very fine tubular pores; 5 percent pebbles, 5 percent cobbles; common thin clay films on faces of pebbles and lining pores; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 8 inches thick)

Bqk—16 to 24 inches; very pale brown (10YR 7/3) gravelly clay loam, brown (10YR 5/3) moist; massive; hard, firm, sticky and plastic; few very fine roots; many very fine tubular pores; 15 percent pebbles, 5 percent cobbles, 25 percent pebble-sized duripan fragments; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 20 inches thick)

Bqkm—24 to 28 inches; white (10YR 8/2), indurated duripan, brown (10YR 5/3) moist; massive; extremely hard, extremely firm; violently effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (4 to 10 inches thick)

2R—28 inches; basalt.

**Type location:** Pershing County, Nevada; in the eastern part of the East Range, about 1,300 feet west and 1,400 feet north of the southeast corner of sec. 29, T. 30 N., R. 38 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and spring

**Soil temperature:** 47 to 52 degrees F

**Depth to the Bq horizon:** 11 to 18 inches

**Depth to a duripan:** 20 to 26 inches

**Depth to bedrock:** 24 to 40 inches

**Control section:** Content of clay—20 to 35 percent; content of rock fragments—0 to 15 percent, mainly pebbles

**A horizon:**
- Value—3 or 4 moist
- Chroma—2 or 3
- Reaction—neutral or mildly alkaline

**Bt horizon:**
- Value—5 or 6 dry
- Chroma—2 to 4
- Texture—loam, clay loam, or sandy clay loam

**Bq and Bqk horizons:**
- Value—6 or 7 dry, 4 or 5 moist
- Texture—loam, gravelly or cobbly fine sandy loam, gravelly loam, or gravelly clay loam
- Reaction—moderately alkaline or strongly alkaline

**Bqkm horizon:**
- Value—7 or 8 dry, 4 or 5 moist
- Chroma—2 or 3

**Sodhouse Series**

The Sodhouse series consists of shallow, well drained, moderately permeable soils that formed in alluvium derived from mixed rock sources and in loess high in content of volcanic ash. Sodhouse soils are on fan piedmont remnants. Slopes are 2 to 8 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Durothids

**Typical pedon:** Sodhouse gravelly very fine sandy loam, 2 to 8 percent slopes, in an area of Knott-Sodhouse-Wholan association where pebbles cover about 8 percent of the surface:

A1—0 to 2 inches; very pale brown (10YR 7/3) gravelly very fine sandy loam, brown (10YR 5/3) moist;
weak very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 15 percent pebbles; moderately alkaline (pH 7.9); clear smooth boundary. (1 to 4 inches thick)

A2—2 to 5 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 5/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 6 inches thick)

Bw1—5 to 10 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary. (3 to 7 inches thick)

Bw2—10 to 14 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine tubular pores; 5 percent pebbles; slightly effervescent; common fine lime filaments; moderately alkaline (pH 8.4); abrupt smooth boundary. (3 to 6 inches thick)

Bqkm—14 to 29 inches; white (10YR 8/2), indurated duripan, light brownish gray (10YR 6/2) moist; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (10 to 24 inches thick)

2Ck—29 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; 60 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Pershing County, Nevada; about 32 miles southeast of Winnemucca, in northern Buffalo Valley, about 900 feet west and 750 feet north of the southeast corner of sec. 21, T. 32 N., R. 41 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods in winter and spring

**Soil temperature:** 47 to 53 degrees F

**Depth to an indurated duripan:** 14 to 20 inches

**Thickness of the duripan:** 10 to 24 inches

**Depth to the Ck horizon:** 25 to 44 inches

**Content of clay in the control section:** 8 to 15 percent

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline, generally becoming more alkaline with depth

**Other features:** Durinodes and lime accumulations in the subhorizons directly above the duripan in some pedons

**A horizon:**
- Hue—10YR or 2.5Y
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3
- Other features—normally noneffervescent; because of lime recharge from dust, slightly effervescent in some pedons

**Bw horizon:**
- Hue—10YR or 2.5Y
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—3 or 4
- Texture—very fine sandy loam, fine sandy loam, loam, or gravelly loam
- Content of rock fragments—5 to 35 percent, mainly pebbles

**Bqkm horizon:**
- Hue—10YR or 2.5Y
- Value—6 to 8 dry, 4 to 6 moist
- Chroma—2 to 4
- Structure—platy or massive

**2Ck horizon:**
- Texture—extremely gravelly sandy loam or very gravelly loamy sand

**Sondoa Series**

The Sondoa series consists of very deep, well drained soils that formed in alluvium and lacustrine sediments derived from mixed rock sources. Sondoa soils are on stream terraces and lake plain terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 6 inches, and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Sondoa silt loam, 0 to 2 percent slopes, in an area of Sondoa-Swingle-Isolde association:

A1—0 to 2 inches; light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; strong thick platy structure; slightly hard, friable, very sticky and plastic; few very fine roots; many very fine and common medium and coarse vesicular pores; violently effervescent; very strongly alkaline (pH 9.4); abrupt smooth boundary. (1 to 5 inches thick)

A2—2 to 6 inches; light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; very thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine and fine tubular pores; strongly effervescent;
very strongly alkaline (pH 9.4); abrupt smooth boundary. (0 to 5 inches thick)

C1—6 to 16 inches: light gray (10YR 7/2) silty clay loam, grayish brown (10YR 5/2) moist; strong fine prismatic structure parting to medium subangular blocky; hard, firm, sticky and plastic; few very fine roots; many very fine, common fine and medium, and few coarse tubular pores; few crustacean shells one-quarter to one-half inch in diameter; few large manganese stains on faces of ped; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (5 to 15 inches thick)

C2—16 to 20 inches: light gray (10YR 7/2) silty clay loam, grayish brown (10YR 5/2) moist; massive; hard, firm, sticky and plastic; few very fine roots; common very fine and few fine and medium tubular pores; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (0 to 6 inches thick)

2C3—20 to 22 inches: light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine and few fine and medium tubular pores; silt coatings lining pores; strongly effervescent; very strongly alkaline (pH 9.4); abrupt smooth boundary. (2 to 12 inches thick)

3C4—22 to 26 inches: light gray (10YR 7/2) silty clay loam, grayish brown (10YR 5/2) moist; massive; hard, firm, sticky and very plastic; few very fine and fine roots; many very fine and fine and common medium tubular pores; silt coatings lining pores; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (3 to 8 inches thick)

3C5—26 to 32 inches: light gray (10YR 7/2) silty clay loam, grayish brown (10YR 5/2) moist; massive; slightly hard, friable, sticky and plastic; few very fine and medium roots; many very fine, common fine and medium, few coarse tubular pores; few large manganese stains; few crustacean shells one-quarter to one-half inch in diameter; strongly effervescent; very strongly alkaline (pH 9.2); gradual smooth boundary. (0 to 8 inches thick)

3C6—32 to 47 inches: light gray (10YR 7/2) silty clay loam, grayish brown (10YR 5/2) moist; massive; slightly hard, friable, very sticky and plastic; few medium and coarse and common very fine and fine tubular pores; silt coatings lining pores; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary. (0 to 20 inches thick)

4C7—47 to 60 inches: light gray (10YR 7/2) silty clay loam, grayish brown (10YR 5/2) moist; common medium reddish yellow (7.5YR 7/6) reticulate mottles; massive; slightly hard, firm, sticky and plastic; common medium and coarse and many very fine and fine tubular pores; silt coatings lining pores; common medium and large manganese stains; strongly effervescent; very strongly alkaline (pH 9.2).

**Type location:** Pershing County, Nevada; about 3 miles northeast of Toulon, about 2,400 feet east and 2,300 feet south of the northwest corner of sec. 26, T. 26 N., R. 30 E. (40 degrees, 5 minutes, 40 seconds north latitude and 118 degrees, 34 minutes, 50 seconds west longitude).

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in winter and spring

**Soil temperature:** 53 to 57 degrees F

**Control section:** Content of clay—average of 25 to 35 percent; texture—stratified silt loam and silty clay loam

**Reaction throughout the profile:** Strongly alkaline or very strongly alkaline

**Calcium carbonate equivalent:** 4 to 12 percent

**Effervescence:** Strongly effervescent or violently effervescent

**A horizon:**

Hue—10YR or 2.5Y
Value—6 or 7 dry. 3, 4, or 5 moist; in a buried A horizon near flood plain remnants, value commonly of 3 moist and, when rubbed, lightening to 4 moist

Chroma—2 or 3

Other features—a buried A horizon in some pedons

**C horizon:**

Hue—10YR or 2.5Y
Value—6 or 7 dry. 4 or 5 moist
Chroma—2 or 3 percent

Texture—stratified silt loam and silty clay loam; thin or very thin varves of fine sand in some pedons

Content of clay—25 to 35 percent

Structure—prismatic or subangular blocky; massive in some pedons

Reaction—strongly alkaline or very strongly alkaline

Sodium adsorption ratio—more than 70

Segregated lime—soft masses of lime in some subhorizons in some pedons

Relict mottles—common in any subhorizon in the lower part of the profile

**Sonoma Series**

The Sonoma series consists of very deep, poorly drained, moderately permeable soils that formed in alluvium derived from mixed rock sources and in a component of volcanic ash. Sonoma soils are on flood plains and low stream terraces. Slopes are 0 to 2
percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aeric Fluvaquents

**Typical pedon:** Sonoma silt loam, occasionally flooded, strongly saline-sodic:

**A1**—0 to 2 inches; light brownish gray (10YR 6/2) silt loam, grayish brown (10YR 5/2) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine and few fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 4 inches thick)

**A2**—2 to 4 inches; light brownish gray (10YR 6/2) silt loam, grayish brown (10YR 5/2) moist; weak very thin platy structure; slightly hard, very friable, sticky and slightly plastic; many very fine roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (1 to 4 inches thick)

**A3**—4 to 9 inches; light brownish gray (10YR 6/2) silt loam, grayish brown (10YR 5/2) moist; strong thin platy structure; hard, firm, sticky and plastic; many very fine and common fine and medium roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (3 to 7 inches thick)

**C1**—9 to 15 inches; light brownish gray (10YR 6/2) silty clay loam, grayish brown (10YR 5/2) moist; massive; hard, firm, slightly sticky and plastic; many very fine, common fine, and few medium roots; many very fine and few fine tubular pores; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (5 to 7 inches thick)

**C2**—15 to 34 inches; light gray (10YR 7/2) silty clay loam, grayish brown (10YR 5/2) moist; few fine distinct reddish yellow (7.5YR 6/6) mottles; massive; hard, firm, sticky and plastic; few very fine, fine, and medium roots; many very fine and fine and few medium tubular pores; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (10 to 24 inches thick)

**C3**—34 to 60 inches; light gray (10YR 7/2) silty clay loam, grayish brown (10YR 5/2) moist; few fine distinct reddish yellow (7.5YR 6/6) mottles; massive; hard, friable, sticky and plastic; very fine roots; many very fine and fine and common medium tubular pores; strongly effervescent; strongly alkaline (pH 8.8).

**Type location:** Pershing County, Nevada; about 10 miles northeast of Inlay, on the flood plain along the Humboldt River, about 2,600 feet west and 1,700 feet south of the northeast corner of sec. 33, T. 34 N., R. 35 E.

**Range in Characteristics**

**Soil moisture:** Saturated in spring and early summer; unless the soils are drained, a water table below a depth of 40 inches during the rest of the year

**Soil temperature:** 49 to 53 degrees F

**Control section:** Content of clay—25 to 35 percent; texture—stratified silt loam to silty clay loam that has strata of clay or silty clay in some pedons

**Carbonates:** Calcium carbonate equivalent of 3 to 12 percent throughout the profile; strong or violent effervescence

**Other features:** A buried A horizon at a depth of 30 to 55 inches in some pedons

**A horizon:**

Hue—2.5Y or 10YR
Value—3 to 5 moist
Reaction—moderately alkaline or very strongly alkaline; moderately alkaline or strongly alkaline in the buried A horizon

**C horizon:**

Hue—10YR to 5Y
Value—6 to 8 dry, 3 to 5 moist
Chroma—dominantly 1 or 2; subhorizons with chroma of 3 in some pedons
Structure—platy or subangular blocky; massive in some pedons
Reaction—moderately alkaline to very strongly alkaline

**Other features:** freshwater crustacean shells and lime concretions one-quarter to one-half inch in diameter in most pedons

**Spinlin Series**

The Spinlin series consists of moderately deep, well drained, slowly permeable soils that formed in residuum and colluvium derived from quartzite, chert, and rhyolite. Spinlin soils are on north aspects of side slopes on mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 13 inches, and the mean annual temperature is about 38 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic Argic Cryoborolls

**Typical pedon:** Spinlin very stony silt loam, 30 to 50 percent slopes, in an area of Golsum-Spinlin-Harcany association; in Humboldt County, east part:

**A**—0 to 6 inches; grayish brown (10YR 5/2) very stony silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine
roots; many very fine interstitial pores; 15 percent pebbles, 10 percent stones; neutral (pH 6.8); clear wavy boundary. (4 to 12 inches thick)

Bt1—6 to 16 inches; grayish brown (10YR 5/2) very cobbly clay, dark brown (10YR 3/3) moist; moderate very fine subangular blocky structure; hard, firm, very sticky and very plastic; common very fine roots; common very fine interstitial and tubular pores; many thin clay films on faces of pedds and lining pores; 20 percent cobbles, 15 percent pebbles; neutral (pH 6.8); abrupt wavy boundary. (6 to 15 inches thick)

Bt2—16 to 24 inches; brown (10YR 4/3) very cobbly clay, dark yellowish brown (10YR 3/4) moist; weak fine prismatic structure; very hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; many thin and few moderately thick clay films on faces of pedds and lining pores; 20 percent cobbles, 15 percent pebbles; neutral (pH 7.0); clear wavy boundary. (6 to 12 inches thick)

Btk—24 to 36 inches; yellowish brown (10YR 5/4) very cobbly clay, dark yellowish brown (10YR 4/4) moist; weak fine angular blocky structure; hard, firm, very sticky and very plastic; few very fine roots; few very fine interstitial and tubular pores; many thin clay films on faces of pedds and lining pores; 25 percent cobbles, 15 percent pebbles; coatings of lime on cobbles and pebbles; many medium distinct lime mottles; strongly effervescent in the matrix and violently effervescent on coatings and mottles; moderately alkaline (pH 8.4); abrupt wavy boundary. (6 to 18 inches thick)

2Cr—36 inches; yellowish brown (10YR 5/4) saprolite weathered from quartzite and chert.

Type location: Humboldt County, Nevada; about 1,800 feet east and 900 feet north of the southwest corner of secs. 23, T. 34 N., R. 39 E.

Range in Characteristics

Soil moisture: Moist in winter and spring, dry from mid-July through October

Soil temperature: 36 to 41 degrees F

Average soil temperature in summer: 54 to 59 degrees F

Mollic epipedon: 10 to 16 inches thick

Depth to paralithic contact: 30 to 40 inches

Depth to lime: 18 to 29 inches

Control section: Content of clay—40 to 60 percent; content of rock fragments—35 to 50 percent, mainly pebbles and cobbles

A horizon:

Chroma—2 or 3

Structure—platy, granular, or subangular blocky

Bt horizon:

Chroma—3 or 4

Texture—very gravelly or very cobbly clay

Structure—moderate or strong, very fine or fine, subangular or angular blocky in the upper few inches; strong fine or medium prismatic in the lower part in some pedons

Reaction—neutral in the upper part to moderately alkaline in the lower part

Sumine Series

The Sumine series consists of moderately deep, well drained, moderately permeable soils that formed in residuum and colluvium weathered from quartzite, latite, trachyte, breccia, and sandstone. Sumine soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 42 degrees F.

Taxonomic class: Loamy-skeletal, mixed, frigid Aridic Argixerolls

Typical pedon: Sumine cobbly loam, 30 to 50 percent slopes, in an area of Sumine-Gosumi-Nomara association where pebbles cover about 15 percent, cobbles 15 percent, and stones 5 percent of the surface:

A—0 to 2 inches; grayish brown (10YR 5/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure that parts to moderate very fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial pores; 10 percent pebbles, 15 percent cobbles, 4 percent stones; neutral (pH 7.0); clear wavy boundary. (1 to 4 inches thick)

Bt1—2 to 7 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial pores; 30 percent pebbles, 10 percent cobbles; few thin clay films on faces of pedds and lining pores; neutral (pH 7.0); clear wavy boundary. (3 to 7 inches thick)

Bt2—7 to 12 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; 20 percent pebbles, 15 percent cobbles; common thin clay films on faces of pedds and lining pores; neutral (pH 7.2); abrupt wavy boundary. (3 to 7 inches thick)

Bt3—12 to 22 inches; yellowish brown (10YR 5/4) very gravelly clay loam, brown (10YR 4/3) moist; massive; hard, friable, sticky and plastic; few very fine roots; few very fine tubular pores; 30 percent
pebbles, 10 percent cobbles; few thin clay films lining pores; neutral (pH 7.0); abrupt irregular boundary. (9 to 26 inches thick)

2R—22 inches; fractured quartzite.

Type location: Pershing County, Nevada; about 8 miles south of Winnemucca, in the Sonoma Range, about 1,000 feet east and 300 feet south of the northwest corner of sec. 3, T. 34 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring

Soil temperature: 42 to 47 degrees F

Mollic epipedon: 8 to 15 inches thick

Depth to bedrock: 20 to 40 inches

Combined thickness of the A and Bt horizons: 20 to 40 inches

Control section: Content of clay—25 to 35 percent, when mixed; texture—dominantly clay loam but thin horizons of loam or clay in some pedons; content of rock fragments—average of 35 to 60 percent

Reaction throughout the profile: Neutral or mildly alkaline

A horizon:

Chroma—2 or 3

Structure—weak or moderate, very thin to medium platy or very fine to medium, granular or subangular blocky

Consistence—soft or slightly hard, very friable or friable

Bt horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Structure—weak or moderate, very fine to medium, angular or subangular blocky; massive in the lower part in some pedons

Sumya Series

The Sumya series consists of shallow, well drained, slowly permeable soils that formed in residuum weathered from andesite flow and breccia. Sumya soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 11 inches, and the mean annual temperature is about 43 degrees F.

Taxonomic class: Clayey-skeletal, montmorillonitic, nonacid, frigid Lithic Xeric Torriorthents

Typical pedon: Sumya very cobbly clay loam, 30 to 50 percent slopes, in an area of Roca-Reluctan-Sumya association where pebbles cover about 25 percent, cobbles 15 percent, and stones 3 percent of the surface:

A1—0 to 2 inches; pale brown (10YR 6/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; many very fine and fine vesicular pores; 20 percent pebbles, 15 percent cobbles, 3 percent stones; neutral (pH 7.2); clear smooth boundary. (1 to 5 inches thick)

A2—2 to 4 inches; pale brown (10YR 6/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; slightly hard, friable, sticky and plastic; common very fine and fine and few coarse roots; common fine tubular pores; 35 percent pebbles, 5 percent cobbles; neutral (pH 7.2); clear smooth boundary. (2 to 5 inches thick)

C—4 to 9 inches; light brown (7.5YR 6/4) very gravelly clay, dark brown (7.5YR 4/4) moist; massive; slightly hard, firm, sticky and plastic; common very fine and few fine to coarse roots; common fine tubular pores; 35 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); abrupt smooth boundary. (4 to 8 inches thick)

R—9 inches; andesite.

Type location: Pershing County, Nevada, in the southern part of the Tobin Range, about 2,200 feet north and 2,000 feet east of the projected southwest corner of sec. 3, T. 27 N., R. 39 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; moist in winter and spring, dry from July through October

Soil temperature: 44 to 47 degrees F

Depth to bedrock: 7 to 12 inches

Control section: Content of clay—average of 35 to 45 percent; content of rock fragments—35 to 60 percent, mainly pebbles; reaction—neutral or mildly alkaline

Other features: Noncalcereous throughout the profile

A horizon:

Value—3 or 4 moist

C horizon:

Hue—10YR or 7.5YR

Chroma—3 or 4

Texture—very gravelly clay or very gravelly clay loam

Swinger Series

The Swinger series consists of very deep, moderately well drained, moderately slowly permeable soils that formed in silty alluvium over lacustrine deposits derived from mixed rock sources. Swinger
soils are on lake plain terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 53 degrees F.

**Taxonomic class**: Fine-silty, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon**: Swingler silt loam, strongly saline-sodic, 0 to 2 percent slopes, in an area of Mazuma-Swingler-Trocken association:

A1—0 to 3 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; strong thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many fine and medium vesicular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 8 inches thick)

A2—3 to 6 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; strong thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (2 to 8 inches thick)

C1—6 to 24 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine and few medium tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (8 to 20 inches thick)

C2—24 to 35 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; common fine distinct dark brown (7.5YR 4/4) relict mottles; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine and common medium tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (8 to 16 inches thick)

C3—35 to 60 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; common fine distinct dark brown relict mottles (7.5YR 4/4); massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine and fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0).

**Type location**: Pershing County, Nevada; about 30 miles east of Lovelock, in Buena Vista Valley, about 700 feet east and 800 feet south of the projected northwest corner of sec. 34, T. 27 N., R. 36 E.

**Range in Characteristics**

**Soil moisture**: Usually dry; intermittently moist in winter and spring

**Soil temperature**: 53 to 57 degrees F

**Depth to relict mottles**: 19 to 40 inches

**Content of clay in the control section**: 18 to 25 percent

**Effervescence**: Strongly effervescent or violently effervescent throughout the profile in most pedons but effervescent to a depth of at least 30 inches and non-effervescent below that depth in some pedons

**A horizon**:

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**C horizon**:

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**Teguro Series**

The Teguro series consists of shallow, well drained, moderately slowly permeable soils that formed in residuum weathered from rhyolitic tuff. Teguro soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 45 degrees F.

**Taxonomic class**: Loamy, mixed, frigid Lithic Argixerolls

**Typical pedon**: Teguro very stony loam, 30 to 50 percent slopes, in an area of Jobpeak-Teguro-Rock outcrop association where stones cover about 3 percent, cobbles 10 percent, and pebbles 10 percent of the surface:

A1—0 to 2 inches; grayish brown (10YR 5/2) very stony loam, very dark grayish brown (10YR 3/2) moist; moderate medium platy structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine interstitial pores; 5 percent stones, 10 percent cobbles, 15 percent pebbles; neutral (pH 7.2); clear smooth boundary. (1 to 4 inches thick)

A2—2 to 7 inches; grayish brown (10YR 5/2) gravelly loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine interstitial pores; 15
percent pebbles; neutral (pH 7.2); clear smooth boundary. (0 to 6 inches thick)

Bt1—7 to 12 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine to coarse roots; common very fine tubular pores; common thin clay films on faces of peds; 15 percent pebbles; neutral (pH 7.0); clear smooth boundary. (3 to 6 inches thick)

Bt2—12 to 19 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; moderate fine and medium angular blocky structure; hard, friable, sticky and plastic; few very fine to coarse roots; common very fine tubular pores; common thin clay films on faces of peds; 25 percent pebbles; mildly alkaline (pH 7.4); abrupt wavy boundary. (4 to 7 inches thick)

R—19 inches; fractured rhyolithic tuff.

Type location: Pershing County, Nevada; in the northern part of the Stillwater Range, about 2,400 feet east and 2,500 feet south of the northwest corner of sec. 15, T. 25 N., R. 36 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; moist in winter and spring, dry from mid-July through early October

Soil temperature: 43 to 47 degrees F

Mollic epipedon: 7 to 12 inches thick; includes the upper part of the Bt horizon

Depth to bedrock: 14 to 20 inches

Control section: Content of clay—25 to 35 percent;
content of rock fragments—15 to 35 percent, mainly pebbles

Reaction throughout the profile: Slightly acid or neutral

A horizon:
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3 dry or moist

Bt horizon:
Value—5 or 6 dry, 3 or 4 moist
Chroma—3 or 4 dry or moist
Texture—gravelly loam or gravelly clay loam

Taxonomic class: Loamy, mixed, mesic, shallow Typic Nadurargids

Typical pedon: Tenabo cobbly very fine sandy loam, 2 to 8 percent slopes, in an area of Tenabo-Daick-Oxcorel association:

A—0 to 5 inches; pale brown (10YR 6/3) cobbly very fine sandy loam, brown (10YR 4/3) moist; strong thick platy structure; soft, very friable, slightly sticky and slightly plastic; few medium and coarse, common fine, and many very fine roots; many very fine and common fine and medium vesicular pores; 10 percent pebbles, 10 percent cobbles; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (2 to 6 inches thick)

2Bt—5 to 11 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; moderate fine and medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, very sticky and plastic; common very fine and fine roots; many very fine tubular pores; 5 percent pebbles; many clay films on faces of peds and lining pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 8 inches thick)

2Btnt—11 to 17 inches; very pale brown (10YR 7/3) gravelly clay loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; soft, very friable, sticky and slightly plastic; many very fine and common fine roots; many very fine tubular pores; 15 percent pebbles, 15 percent duripan fragments; few thin clay films on faces of peds and lining pores; violently effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary. (3 to 7 inches thick)

2Bqkm—17 to 24 inches; white (10YR 8/2), indurated duripan, very pale brown (10YR 7/3) moist; massive; extremely hard, extremely firm; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (6 to 15 inches thick)

3C1—24 to 31 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine tubular pores; 55 percent pebbles, 10 percent cobbles, 10 percent duripan fragments; violently effervescent; strongly alkaline (pH 9.0); gradual smooth boundary. (5 to 15 inches thick)

3C2—31 to 60 inches; light gray (10YR 7/2) extremely gravelly loamy sand, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots;

Tenabo Series

The Tenabo series consists of shallow, well drained, moderately permeable soils that formed in a thin loess mantle over alluvium derived from mixed rock sources. Tenabo soils are on fan piedmont remnants. Slopes are 2 to 15 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 47 degrees F.
common very fine tubular pores; 50 percent pebbles, 25 percent cobbles, 10 percent duripan fragments; violently effervescent; strongly alkaline (pH 9.0).

Type location: Pershing County, Nevada; about 5 miles south of Needle Peak, in Jersey Valley, about 600 feet north and 1,200 feet west of the southeast corner of sec. 31, T. 28 N., R. 40 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 47 to 51 degrees F
Control section: Content of clay—27 to 35 percent; content of rock fragments—less than 20 percent, when mixed
Depth to a duripan: 9 to 20 inches
Reaction: Moderately alkaline or strongly alkaline in the A and Bt horizons and moderately alkaline to very strongly alkaline below the Bt horizon
Effervescence: Ranging from noneffervescent at the surface to violently effervescent in the layer above the duripan in areas that are subject to recharge with lime

A horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Structure—weak or moderate, very thin to thick platy; granular in some pedons

Bt and Bt horizon:
Value—5 to 7 dry, 4 or 5 moist
Chroma—3, 4, or 6
Texture of the fine-earth fraction—clay loam, silty clay loam, or sandy clay loam; thin strata of silt loam in some pedons
Content of rock fragments—less than 20 percent, mainly pebbles; including some duripan fragments in some pedons
Structure—moderate fine or medium prismatic or subangular blocky
Reaction—moderately alkaline or strongly alkaline, generally becoming more alkaline with depth
Exchangeable sodium—15 to 30 percent
Carbonates—violently effervescent in the lower subhorizons in some pedons and segregated lime in those subhorizons

Bqkm horizon:
Value—6 to 8 dry, 4 to 7 moist
Chroma—2 to 4
Other features—very hard to extremely hard, continuous laminae stratified with strongly cemented material

C horizon:
Texture—gravely to extremely gravelly sand, loamy sand, or sandy loam
Content of rock fragments—15 to 85 percent, mainly pebbles and cobbles

Theon Series

The Theon series consists of shallow, well drained, moderately slowly permeable soils that formed in residuum and colluvium derived from andesite, dacite, rhyolite, or granitic rocks. Theon soils are on side slopes of hills and mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 50 degrees F.

Taxonomic class: Loamy-skeletal, mixed, mesic Lithic Haplargids

Typical pedon: Theon very cobbly loam, 30 to 50 percent slopes, in an area of Theon-Singatse-Rock outcrop association where pebbles cover about 10 percent, cobbles 20 percent, and stones 5 percent of the surface:

A—0 to 3 inches; pale brown (10YR 6/3) very cobbly loam, dark grayish brown (10YR 4/2) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and common fine vesicular and few very fine tubular pores; 15 percent pebbles, 20 percent cobbles; mildly alkaline (pH 7.8); abrupt smooth boundary. (2 to 5 inches thick)

Bt—3 to 8 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; common very fine tubular pores; 35 percent pebbles, 10 percent cobbles; few thin clay films on faces of peds and lining pores; moderately alkaline (pH 8.4); abrupt smooth boundary. (5 to 10 inches thick)

2R—8 inches; granite; weathered in parts of the upper 2 inches.

Type location: Pershing County, Nevada; in the southern part of the Eugene Mountains, about 2,200 feet south and 2,200 feet west of the northeast corner of sec. 27, T. 33 N., R. 33 E.

Range in Characteristics

Soil moisture: Usually dry; moist for short periods in winter and spring
Soil temperature: 53 to 59 degrees F
**Combined thickness of the A and Bt horizons:** 8 to 14 inches

**Control section:** Content of clay—25 to 35 percent; content of rock fragments—35 to 60 percent, mainly pebbles

**Depth to lithic contact:** 8 to 14 inches

**Other features:** Discontinuous, thin coatings of silica or of silica and lime along weak fracture planes in the bedrock in some pedons

**A horizon:**
- Value—5 to 7 dry, 3 to 5 moist
- Chroma—2 to 4
- Content of rock fragments—35 to 80 percent, mainly pebbles and cobbles
- Structure—platy or granular
- Reaction—neutral to moderately alkaline

**Bt horizon:**
- Hue—10YR, 7.5YR, or 5YR
- Value—4 to 7 dry, 3, 4, or 5 moist
- Chroma—3 or 4
- Texture—very gravelly clay loam, very gravelly sandy clay loam, or very gravelly loam; extremely gravelly subhorizons in some pedons
- Reaction—neutral to strongly alkaline

**Toulon Series**

The Toulon series consists of very deep, excessively drained, moderately rapidly permeable soils that formed in waterworn pebbles, sand, and a small amount of silt derived from mixed rock sources. Toulon soils are on barrier bars and offshore bars. Slopes are 2 to 8 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Camborthids

**Typical pedon:** Toulon very gravelly loam, 2 to 8 percent slopes, in an area of Mazuma-Toulon-Chumall association where pebbles cover about 75 percent of the surface:

- **A1**—0 to 2 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 5/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and common fine and few medium vesicular pores; 35 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 5 inches thick)

- **A2**—2 to 5 inches; very pale brown (10YR 7/3) gravelly loam, brown (10YR 5/3) moist; weak thin platy structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine roots; many very fine and few fine tubular pores; 25 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 9 inches thick)

**Bw1**—5 to 13 inches; very pale brown (10YR 7/3) gravelly loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and few fine roots; common very fine tubular pores; 25 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 10 inches thick)

**Bw2**—13 to 18 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; common very fine tubular pores; 40 percent pebbles; reddish iron stains coating rock fragments; few patchy lime coatings on the underside of pebbles; slightly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (0 to 10 inches thick)

**Bk1**—18 to 28 inches; very pale brown (10YR 7/3) very gravelly coarse sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine roots; common very fine tubular pores; 40 percent pebbles; lime coatings on the underside of pebbles; slightly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (8 to 20 inches thick)

**Bk2**—28 to 60 inches; very pale brown (10YR 8/3) extremely gravelly coarse sand, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 70 percent pebbles; lime coatings on all sides of pebbles; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Pershing County, Nevada; about 12 miles southeast of Lovelock, in the Carson Sink, about 350 feet west and 1,600 feet south of the northeast corner of sec. 7, T. 25 N., R. 33 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for intermittent periods in winter and spring

**Soil temperature:** 53 to 57 degrees F

**Depth to the base of the Bw horizon:** 13 to 20 inches

**Reaction throughout the profile:** Mildly alkaline to strongly alkaline

**Other features:** Commonly thinner A and Bw horizons on the lower parts of bars than on the higher parts

**A horizon:**
- Hue—2.5Y or 10YR
- Value—6 to 8 dry, 4 or 5 moist
Effervescence—noneffervescent to violently effervescent

**Bw horizon:**
- Hue—2.5Y or 10YR
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 to 4
- Texture—stratified very gravelly coarse sandy loam to very gravelly loam; fine strata of fine sandy loam and very fine sandy loam in some pedons
- Content of rock fragments—25 to 60 percent, mostly pebbles
- Structure—subangular blocky or massive
- Effervescence—slightly effervescent to violently effervescent
- Carbonates—few or no lime incrustations in the upper part of the horizon
- Other features—no gypsum or tufa in some pedons; the number of relict oxide mottles increasing with depth

**Bk horizon:**
- Texture—stratified gravelly coarse sand to extremely cobbly coarse sand
- Content of clay—0 to 5 percent
- Content of rock fragments—average of 5 to 35 percent cobbles and 45 to 60 percent pebbles; as much as 80 percent pebbles or cobbles in any single stratum

**Trocken Series**

The Trocken series consists of very deep, well drained, moderately permeable soils that formed in mixed alluvium. Trocken soils are on fan skirts and offshore bars. Slopes are 0 to 15 percent. The mean annual precipitation is about 6 inches, and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Trocken very fine sandy loam, 0 to 2 percent slopes, in an area of Trocken-Ragtown association where pebbles cover about 15 percent and cobbles 1 percent of the surface:
- A—0 to 3 inches; light gray (10YR 7/2) very fine sandy loam, grayish brown (10YR 5/2) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and common fine vesicular pores; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 6 inches thick)
- Bw—3 to 9 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine roots; common very fine tubular pores; 45 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (3 to 6 inches thick)
- Bk1—9 to 13 inches; very pale brown (10YR 7/3) very gravelly sandy loam, grayish brown (10YR 5/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; few very fine and fine tubular pores; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (3 to 7 inches thick)
- Bk2—13 to 24 inches; very pale brown (10YR 7/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; 35 percent pebbles; common fine and medium lime masses; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (7 to 15 inches thick)
- 2C1—24 to 38 inches; light gray (10YR 7/2) extremely gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; common fine tubular pores; 65 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (10 to 25 inches thick)
- 3C2—38 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Pershing County, Nevada; about 10 miles south of Lovelock, in the Carson Sink, about 2,200 feet north and 1,200 feet east of the southwest corner of sec. 28, T. 25 N., R. 32 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods in winter and spring

**Soil temperature:** 53 to 57 degrees F

**Combined thickness of the A and Bw horizons:** 5 to 10 inches

**Control section:** Content of clay—8 to 18 percent; content of rock fragments—35 to 70 percent; texture—highly stratified with layers that average very cobbly loam to extremely gravelly coarse sandy loam and individual strata ranging from gravelly loam to extremely gravelly coarse sand

**Reaction:** Neutral to very strongly alkaline in the upper part of the profile and moderately alkaline to very strongly alkaline in the lower part
**Other features:** The C horizon is below a depth of 60 inches in some pedons.

**A horizon:**
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry, 4, 5, or 6 moist
- Chroma—2 or 3

**Bw and Bk horizons:**
- Hue—7.5YR, 10YR, or 2.5Y
- Value—5 or 6 dry, 4 or 5 moist
- Chroma—3 or 4

**Trocken Variant**

The Trocken Variant consists of very deep, well drained, moderately rapidly permeable soils that formed in alluvium derived from mixed rock sources. Trocken Variant soils are on inset fans. Slopes are 2 to 8 percent. The mean annual precipitation is 7 to 10 inches, and the mean annual temperature is 45 to 49 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Xeric Torriorthents

**Typical pedon:** Trocken Variant very gravelly very fine sandy loam, 2 to 8 percent slopes, in an area of Oxcord-Whirlo-Trocken Variant association:

**A1**—0 to 2 inches; pale brown (10YR 6/3) very gravelly very fine sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; common very fine vesicular and tubular pores; 40 percent pebbles, 2 percent cobbles; strongly effervescent; moderately alkaline (pH 7.8); clear smooth boundary. (1 to 4 inches thick)

**A2**—2 to 5 inches; pale brown (10YR 6/3) gravelly very fine sandy loam, brown (10YR 4/3) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium roots; many very fine tubular pores; 15 percent pebbles, 2 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (1 to 5 inches thick)

**Bk1**—5 to 11 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many very fine and common fine, medium, and coarse roots; many very fine tubular pores; 50 percent pebbles, 7 percent cobbles; few thin lime coatings on the underside of coarse fragments; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (5 to 8 inches thick)

**2Bk2**—11 to 45 inches; pale brown (10YR 6/3), stratified very gravelly loamy sand and extremely gravelly fine sandy loam, brown (10YR 4/3) moist; massive; loose, nonsticky and nonplastic; many very fine and common fine and medium roots; many very fine and common fine and medium interstitial pores; 55 percent pebbles, 5 percent cobbles; thin lime coatings on the underside of coarse fragments; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (30 to 40 inches thick)

**2C**—45 to 60 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; 40 percent pebbles, 5 percent cobbles; strongly effervescent; very strongly alkaline (pH 9.4).

**Type location:** Pershing County, Nevada; in Jersey Valley, about 300 feet west and 1,900 feet north of the southeast corner of sec. 21, T. 27 N., R. 40 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in late fall, winter, and spring

**Soil temperature:** 47 to 53 degrees F

**Control section:** Texture of the fine-earth fraction—stratified loam to loamy sand; content of pebbles—50 to 70 percent; reaction—mildly alkaline to very strongly alkaline, generally becoming more alkaline with depth; calcium carbonate equivalent—5 to 10 percent

**Trunk Series**

The Trunk series consists of moderately deep, well drained, very slowly permeable soils that formed in residuum and colluvium derived from quartzite, chert, and shale. Trunk soils are on crests and side slopes of mountains. Slopes are 4 to 50 percent. The mean annual precipitation is about 9 inches, and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Xerollc Haplargids

**Typical pedon:** Trunk stony loam, 30 to 50 percent slopes, in an area of Trunk-Pocan association:

**A**—0 to 3 inches; light brownish gray (10YR 6/2) stony loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine interstitial pores; 25 percent pebbles, 2 percent cobbles, 1 percent stones; neutral (pH 7.0); clear smooth boundary. (3 to 6 inches thick)
Bt—3 to 12 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; weak fine prismatic structure parting to strong very fine subangular blocky; very hard, firm, sticky and plastic; common very fine and few fine and medium roots; common very fine and fine tubular pores; many thin and few moderately thick clay films on faces of peds and lining pores; 15 percent pebbles; neutral (pH 7.0); clear wavy boundary. (6 to 15 inches thick)

Btk1—12 to 20 inches; light yellowish brown (10YR 6/4) gravelly clay, yellowish brown (10YR 5/4) moist; very hard, firm, sticky and plastic; few very fine and fine roots; common very fine and fine tubular pores; 25 percent pebbles; many fine soft masses of lime; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 12 inches thick)

Btk2—20 to 30 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots; common very fine and fine tubular pores; 35 percent pebbles; many fine soft masses of lime; violently effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary. (4 to 12 inches thick)

2R—30 inches; fractured quartzite; lime and clay coatings along fractures in the bedrock fragments.

Type location: Pershing County, Nevada; about 14 miles south of Winnemucca, in the Sonoma Range, about 1,000 feet north and 1,000 feet west of the southeast corner of sec. 11, T. 33 N., R. 38 E.

Range in Characteristics

Soil moisture: Usually dry; moist in late fall, winter, and early spring

Soil temperature: 48 to 53 degrees

Depth to bedrock: 20 to 40 inches

Depth to lime: 10 to 20 inches

A horizon:

Value—5 or 6 dry, 3 to 5 moist

Chroma—2 or 3

Reaction—neutral or mildly alkaline

Bt horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly clay loam or gravelly clay that has more than 30 percent sand

Content of clay—35 to 50 percent

Content of rock fragments—15 to 35 percent, mainly pebbles

Reaction—neutral or mildly alkaline in the noncalcareous upper part of the horizon, moderately or strongly alkaline in the calcareous lower part

Tusel Series

The Tusel series consists of deep, well drained, moderately slowly permeable soils that formed in residuum and colluvium weathered from quartzite, chert, and shale. Tusel soils are on side slopes of mountains. Slopes are 30 to 75 percent. The mean annual precipitation is about 17 inches, and the mean annual temperature is about 43 degrees F.

Taxonomic class: Loamy-skeletal, mixed Argic Pachic Cryoborolls

Typical pedon: Tusel cobbly loam, 30 to 50 percent slopes, in an area of Tusel-Layview-Rock outcrop association:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark brown (10YR 2/2) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine tubular pores; 15 percent pebbles, 5 percent cobbles; neutral (pH 6.8); clear smooth boundary.

A2—2 to 12 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; weak very fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine tubular pores; 20 percent pebbles; neutral (pH 6.8); clear smooth boundary.

A3—12 to 19 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; 40 percent pebbles, 10 percent cobbles; neutral (pH 6.8); clear smooth boundary.

2Bt1—19 to 24 inches; brown (10YR 5/3) very gravelly clay loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine roots; many very fine tubular pores; 45 percent pebbles, 20 percent cobbles; few thin clay films on faces of peds and lining pores; neutral (pH 6.8); clear smooth boundary.

2Bt2—24 to 42 inches; pale brown (10YR 6/3) very gravelly clay loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine roots; many very fine tubular pores; 40 percent pebbles, 10 percent cobbles; common thin clay films on faces of peds and lining pores.
pores; neutral (pH 6.8); abrupt smooth boundary.
3R—42 inches; rhyolite.

**Type location:** Pershing County, Nevada; in the Humboldt Range, about 1,000 feet east and 700 feet north of the southwest corner of sec. 31, T. 30 N., R. 34 E.

**Range in Characteristics**

**Soil moisture:** Usually moist during the growing season; moist from late fall through early summer, dry from late July through September

**Soil temperature:** 43 to 47 degrees F

**Average soil temperature in summer:** 58 to 59 degrees F

**Mollic epipedon:** 16 to 20 inches thick

**Depth to the base of the Bt horizon:** 36 to 50 inches

**Depth to bedrock:** 40 to more than 80 inches

**Reaction throughout the profile:** Slightly acid or neutral

**Control section:** Content of clay—25 to 35 percent; content of rock fragments—50 to 75 percent, mainly pebbles

**A horizon:**
- Value—4 or 5 dry, 2 or 3 moist
- Chroma—2 or 3
- Structure—weak to strong, very fine to medium, granular or subangular blocky
- Consistence—soft or slightly hard

**Bt horizon:**
- Hue—10YR or 7.5YR
- Value—5 or 6 dry, 3 or 4 moist
- Chroma—2, 3, or 4
- Texture—very gravelly or extremely gravelly sandy clay loam or very gravelly or extremely gravelly clay loam having 40 to 60 percent sand
- Content of clay—average of 25 to 35 percent
- Content of rock fragments—40 to 60 percent pebbles and 10 to 25 percent cobbles
- Structure—weak or moderate subangular blocky

**Uripnes Series**

The Uripnes series consists of very shallow, well drained, moderately rapidly permeable soils that formed in residuum weathered from granodiorite. Uripnes soils are on side slopes of mountains. Slopes are 15 to 30 percent. The mean annual precipitation is 6 to 8 inches, and the mean annual temperature is 47 to 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, nonacid, mesic, shallow Typic Torriorthents

**Typical pedon:** Uripnes very stony sandy loam, 15 to 30 percent slopes, in an area of Uripnes-Rock outcrop association where pebbles cover about 30 percent, cobbles 10 percent, and stones 5 percent of the surface:

**A1**—0 to 2 inches; light brownish gray (10YR 6/2) very stony sandy loam, grayish brown (10YR 5/2) moist; weak medium platy structure; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; few fine tubular and few medium and coarse vesicular pores; 30 percent pebbles, 10 percent cobbles, 5 percent stones; neutral (pH 7.2); abrupt smooth boundary. (1 to 3 inches thick)

**A2**—2 to 6 inches; light brownish gray (10YR 6/2) very gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure parting to strong fine granular; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; many very fine and fine tubular pores; 50 percent pebbles; neutral (pH 7.2); clear wavy boundary. (1 to 12 inches thick)

**Cr**—6 to 22 inches; weathered granodiorite. (12 to 26 inches thick)

**R**—22 inches; unweathered granodiorite.

**Type location:** Pershing County, Nevada; in the northern part of the Stillwater Range, about 1,100 feet north and 700 feet east of the southwest corner of sec. 27, T. 25 N., R. 36 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods in winter, spring, summer, and autumn

**Soil temperature:** 47 to 54 degrees F

**Depth to weathered bedrock:** 4 to 14 inches

**Depth to unweathered bedrock:** 20 to 40 inches

**Control section:** Texture of the fine-earth fraction—sandy loam or coarse sandy loam; content of clay—5 to 18 percent; content of rock fragments—35 to 60 percent, dominantly fine pebbles

**Valmy Series**

The Valmy series consists of very deep, well drained, moderately permeable soils that formed in a thin loess layer over loamy alluvium derived from mixed rock sources. Valmy soils are on inset fans on basin floor remnants and alluvial flat remnants. Slopes are 0 to 8 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 51 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Durorthic Torriorthents

**Typical pedon:** Valmy loamy fine sand, loamy substratum, 2 to 8 percent slopes, in an area of Bubs-Valmy association where pebbles cover about 10 percent of the surface.
Pershing County, Nevada, East Part

A—0 to 3 inches; light brownish gray (10YR 6/2) loamy fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; common very fine and few fine roots; many very fine interstitial pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 4 inches thick)

C—3 to 10 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and nonplastic; many very fine and few fine roots; common very fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (5 to 18 inches thick)

Cqk—10 to 19 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common very fine and few fine and medium roots; common very fine tubular pores; 20 percent hard, firm, 15- to 25-millimeter durninodes; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (7 to 12 inches thick)

Ck—19 to 29 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; few very fine tubular pores; violently effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (6 to 14 inches thick)

C'qk—29 to 44 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common very fine roots; few very fine tubular pores; 40 percent hard, firm, 15- to 35-millimeter durninodes; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (10 to 20 inches thick)

2Ck—44 to 60 inches; pale brown (10YR 6/3) gravelly very sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; 15 percent pebbles; violently effervescent; strongly alkaline (pH 8.6).

Type location: Pershing County, Nevada; about 3 miles west of Imlay, about 2,400 feet north and 300 feet west of the southeast corner of sec. 12, T. 32 N., R. 33 E.

Range in Characteristics

Soil moisture: Usually dry; moist for short periods in winter and spring

Soil temperature: 47 to 53 degrees F

Depth to the Cq horizon: 8 to 20 inches

Durninodes in the Cq horizon: Making up 5 to 85 percent of the volume in any one horizon; more than 25 percent in one or more horizons more than 6 inches thick

Depth to unconformity: 30 to 50 inches; sandy material at a depth of more than 50 inches in some pedons

Control section: Texture—mainly fine sandy loam or sandy loam but includes strata of very fine sandy loam and coarse sandy loam in some pedons; content of clay—5 to 15 percent; content of rock fragments—0 to 30 percent, mainly pebbles

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry, 3 or 4 moist
Reaction—moderately alkaline or strongly alkaline

C horizon:
Hue—10YR or 2.5Y
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 to 4
Durninodes—hard to extremely hard, firm or very firm, and brittle
Reaction—strongly alkaline or very strongly alkaline
Effervescence—slightly effervescent to violently effervescent

2C horizon:
Texture—gravelly sand or very gravelly sand; silty clay loam below a depth of 40 inches in some areas of loamy substratum phases
Content of clay—1 to 5 percent
Content of rock fragments—15 to 55 percent, mostly pebbles
Reaction—strongly alkaline or very strongly alkaline

Wendane Series

The Wendane series consists of very deep, somewhat poorly drained, moderately slowly permeable soils that formed in silty alluvium derived from mixed sediments. Wendane soils are on alluvial flat remnants and lake plains. Slopes are 0 to 4 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Fine-silty, mixed (calcareous), mesic Aeric Halaquepts

Typical pedon: Wendane silt loam, drained, 0 to 2 percent slopes, in an area of Wendane-Yobe association:

A—0 to 2 inches; pale brown (10YR 6/3) silt loam, dark grayish brown (10YR 4/2) moist; moderate very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 2 percent pebbles; slightly
effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (1 to 6 inches thick)
C—2 to 11 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; common very fine and fine tubular pores; 2 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.4); clear smooth boundary. (5 to 16 inches thick)
Cqk1—11 to 18 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; common very fine and fine and few medium tubular pores; 20 percent 5- to 25-millimeter durinodes; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary. (6 to 30 inches thick)
Cqk2—18 to 30 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; many very fine and few fine and medium tubular pores; 30 percent 5- to 25-millimeter durinodes; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (0 to 17 inches thick)
Cqk3—30 to 60 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; few fine distinct yellowish red (5YR 4/6) mottles; massive; slightly hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and common fine and medium tubular pores; 25 percent 5- to 25-millimeter durinodes; strongly effervescent; strongly alkaline (pH 8.6).

Type location: Pershing County, Nevada; in the southern part of Buffalo Valley, about 400 feet east and 500 feet south of the northwest corner of sec. 7, T. 29 N., R. 41 E.

Range in Characteristics

Soil moisture: Saturated at a depth of 28 to 40 inches in the spring of most years; dry from mid-summer through mid-winter, moist in mid-winter, spring, and early summer; an apparent seasonal high water table at a depth of 2.5 to 4.0 feet from February through July; drained phases in some areas

Soil temperature: 47 to 52 degrees F

Mineralogy: Mixed but strongly influenced by volcanic ash and other pyroclastic material

Depth to the Cqk horizon: 11 to 20 inches

Depth to high-chroma mottles: 13 to 27 inches

Control section: Content of clay—20 to 30 percent, when mixed; texture—averages silt loam or silty clay loam that has less than 15 percent fine sand and coarser sand

Salts: Normally strongly saline affected in the upper part of the profile and unaffected or slightly affected in the lower part

Exchangeable sodium: 15 to 70 percent in half or more of the upper 20 inches but decreases with depth

Reaction throughout the profile: Moderately alkaline to very strongly alkaline

Other features: Unconformable, stratified gravelly sand or very gravelly sand below a depth of 40 inches in some pedons

A horizon:

Value—6 or 7 dry, 4 to 6 moist
Chroma—1 to 4
Structure—thin to thick platy or fine granular; massive in some pedons
Consistence—very friable to firm, slightly sticky to very sticky and plastic to very plastic

C and Cqk horizons:

Hue—10YR or 2.5Y
Value—6 to 8 dry, 4 to 7 moist
Chroma—1 to 4
Texture—stratified very fine sandy loam, silt loam, silty clay loam, or clay loam

Other features—strata of volcanic ash that are 4 to 10 inches thick commonly at some depth between 13 and 36 inches

Cqk horizon:

Thickness—13 to more than 30 inches
Cementation—20 to 35 percent weakly or strongly cemented durinodes in a friable matrix and as much as 30 percent weak, discontinuous silica cementation in any one horizon

Wereld Series

The Wereld series consists of deep, well drained, moderately permeable soils that formed in residuum and colluvium derived from limestone, dolomite, and calcareous shale. Wereld soils are on side slopes of mountains. Slopes are 30 to 50 percent. The mean annual precipitation is about 14 inches, and the mean annual temperature is about 42 degrees F.

Taxonomic class: Loamy-skeletal, mixed, frigid Aridic Calcixerolls

Typical pedon: Wereld very gravelly silt loam, 30 to 50 percent slopes, in an area of Denay-Wereld-Xine association where pebbles cover 40 percent, cobbles 5 percent, and stones 2 percent of the surface:

A1—0 to 3 inches: grayish brown (10YR 5/2) very gravelly silt loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many
very fine roots; common very fine and few fine vesicular pores; 30 percent pebbles, 5 percent cobbles, 2 percent stones; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 5 inches thick)

A2—3 to 10 inches; grayish brown (10YR 5/2) gravelly silt loam, very dark grayish brown (10YR 3/2) moist; weak very thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine tubular pores; 30 percent pebbles; strongly effervescent; thin lime coatings on the underside of pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 10 inches thick)

Bk1—10 to 17 inches; brown (10YR 5/3) very gravelly silt loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine and coarse roots; common very fine tubular pores; 40 percent pebbles; violently effervescent; thin lime coatings on the underside of pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 10 inches thick)

Bk2—17 to 25 inches; pale brown (10YR 6/3) very gravelly silt loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; common very fine tubular pores; 45 percent pebbles, 2 percent cobbles; violently effervescent; thin lime coatings on the underside of rock fragments; moderately alkaline (pH 8.0); clear smooth boundary. (8 to 25 inches thick)

Bk3—25 to 42 inches; very pale brown (10YR 7/3) very gravelly loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; few very fine tubular pores; 50 percent pebbles, 5 percent cobbles; violently effervescent; thin lime coatings on all sides of rock fragments; moderately alkaline (pH 8.4); abrupt smooth boundary. (6 to 20 inches thick)

2R—42 inches; hard, fractured calcareous shale.

Type location: Pershing County, Nevada; near Star Peak, in the Humboldt Range, about 1,400 feet north and 1,900 feet east of the southwest corner of sec. 23, T. 31 N., R. 34 E.

Range in Characteristics

Soil moisture: Usually dry; moist in winter and spring
Soil temperature: 44 to 47 degrees F
Mollic epipedon: 10 to 15 inches thick
Depth to the calcic horizon: 20 to 34 inches
Depth to bedrock: 40 to 60 inches
Control section: Content of clay—12 to 18; content of rock fragments—50 to 70 percent, mainly pebbles

Reaction throughout the profile: Moderately alkaline or strongly alkaline

A horizon:
Value—4 or 5 dry
Chroma—2 or 3
Structure—granular or platy

Bk1 and Bk2 horizons:
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 to 4
Texture—very gravelly loam or very gravelly silt loam
Content of clay—average of 12 to 18 percent
Content of rock fragments—40 to 60 percent, mainly pebbles

Bk3 horizon:
Texture—very gravelly loam, very gravelly silt loam, or extremely gravelly loam
Content of rock fragments—50 to 75 percent, mainly pebbles
Calcium carbonate equivalent—15 to 25 percent

Weso Series

The Weso series consists of very deep, well drained, moderately permeable soils that formed in alluvium derived from mixed rock sources. Weso soils are on fan skirts. Slopes are 0 to 8 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Coarse-loamy, mixed, mesic Camborthids

Typical pedon: Weso very fine sandy loam, 0 to 2 percent slopes:

A1—0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; moderate very thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine and few fine vesicular pores; moderately alkaline (pH 8.2); clear smooth boundary. (1 to 3 inches thick)

A2—2 to 7 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine, fine, medium, and coarse roots; common very fine tubular pores; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 6 inches thick)

Bw—7 to 12 inches; very pale brown (10YR 7/4) very fine sandy loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common very fine and fine and few medium and coarse roots; common very fine tubular pores; strongly
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alkaline (pH 8.6); clear smooth boundary. (4 to 12 inches thick)

Bqk1—12 to 16 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, firm, nonsticky and nonplastic; common very fine and few medium and coarse roots; few very fine tubular pores; weak silica cementation; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 10 inches thick)

Bqk2—16 to 25 inches; very pale brown (10YR 7/3) very fine sandy loam, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and few fine roots; few very fine tubular pores; 40 percent durinodes; strongly effervescent; very strongly alkaline (pH 9.6); clear smooth boundary. (7 to 20 inches thick)

Bqk3—25 to 40 inches; very pale brown (10YR 7/3) very fine sandy loam, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; few very fine tubular pores; weak, discontinuous silica cementation; strongly effervescent; very strongly alkaline (pH 9.6); clear smooth boundary. (10 to 20 inches thick)

2Bqk4—40 to 60 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine tubular pores; 40 percent durinodes; strongly effervescent; moderately alkaline (pH 8.4).

Type location: Pershing County, Nevada; about 13 miles northeast of Imlay, near the Humboldt River, about 1,200 feet west and 500 feet north of the southeast corner of sec. 9, T. 34 N., R. 35 E.

Range in Characteristics

Soil moisture: Usually dry; moist for short periods in winter and spring

Soil temperature: 47 to 53 degrees F

Depth to the base of the Bw horizon and silica cementation: 10 to 18 inches

Control section: Content of clay—5 to 15 percent; content of rock fragments—0 to 25 percent, mainly pebbles; texture—fine sandy loam, very fine sandy loam, or loam and, in some pedons, minor strata of sandy loam, coarse sandy loam, or silt loam

Reaction throughout the profile: Moderately alkaline to very strongly alkaline

Other features: Skeletal material below a depth of 40 inches in some pedons

A horizon:

Value—6 or 7 dry, 3, 4, or 5 moist

Chroma—2 or 3

Bw horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Other features—noncalcareous

Bqk horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Cementation—ranging from continuously, weakly silica-cemented to several weakly cemented plates as much as 1 inch thick; slightly more weakly cemented or friable material between the plates; subhorizons with durinodes in a friable matrix in some pedons

C horizon:

Texture—stratified very gravely loamy sand to fine sandy loam

Content of rock fragments—average of 10 to 20 percent

Reaction—strongly alkaline or very strongly alkaline

Effervescence—noneffervescent to violently effervescent

Whirlo Series

The Whirlo series consists of very deep, well drained, moderately rapidly permeable soils that formed in alluvium derived from mixed rock sources and somewhat influenced by loess. Whirlo soils are on inset fans, fan aprons, fan collars, and fan skirts. Slopes are 0 to 15 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 48 degrees F.

Taxonomic class: Loamy-skeletal, mixed, mesic Typic Camborthids

Typical pedon: Whirlo very fine sandy loam, 0 to 2 percent slopes, in an area of Oxcord-Whirlo-Trocken Variant association where pebbles cover about 10 percent and cobbles 2 percent of the surface:

A1—0 to 3 inches; light brownish gray (10YR 6/2) very fine sandy loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; 15 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 4 inches thick)

A2—3 to 7 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (2 to 5 inches thick)

Bw—7 to 11 inches; light brownish gray (10YR 6/2) fine sandy loam, brown (10YR 4/3) moist; moderate fine
and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary. (3 to 13 inches thick)

2Bk1—11 to 16 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; hard, firm, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 35 percent pebbles; strongly effervescent; many medium lime filaments; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 10 inches thick)

2Bk2—16 to 30 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; few very fine tubular pores; 40 percent pebbles; strongly effervescent; lime coatings on the underside of pebbles; strongly alkaline (pH 8.8); clear smooth boundary. (10 to 20 inches thick)

2Bk3—30 to 42 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; 50 percent pebbles; strongly effervescent; lime coatings on the underside of pebbles; strongly alkaline (pH 8.8); clear wavy boundary. (8 to 15 inches thick)

2Bk4—42 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; 50 percent pebbles; strongly effervescent; common fine lime filaments; strongly alkaline (pH 8.8).

Type location: Pershing County, Nevada; in Jersey Valley, about 1,900 feet west and 1,300 feet north of the southeast corner of sec. 16, T. 27 N., R. 40 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; moist in winter and spring, dry from mid-May through November

Soil temperature: 47 to 53 degrees F

Control section: Content of clay—5 to 15 percent; content of rock fragments—35 to 70 percent, mainly pebbles

Depth to the 2Bk horizon: 10 to 20 inches

A horizon:

Value—6 or 7 dry, 3 or 4 moist
Chroma—2 or 3

Structure—weak or moderate, very thin to thick platy; granular in some pedons
Reaction—neutral to moderately alkaline

Bw horizon:

Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3

Texture—gravelly sandy loam, fine sandy loam, very fine sandy loam, silt loam, or gravelly loam

Content of rock fragments—0 to 30 percent pebbles
Structure—weak or moderate, fine or medium subangular blocky or weak coarse prismatic
Reaction—neutral to moderately alkaline

2Bk horizon:

Hue—10YR or 2.5Y
Value—6 to 8 dry, 3 to 6 moist
Chroma—2 or 3

Texture—stratified very gravelly loam to extremely gravelly coarse sandy loam

Content of rock fragments—35 to 75 percent, mainly pebbles and some cobbles and stones

Reaction—moderately alkaline or strongly alkaline

Effervescence—slightly effervescent to violently effervescent

Other features—as much as 10 percent weak durinodes in some subhorizons

Wholan Series

The Wholan series consists of very deep, well drained, moderately permeable soils that formed in loess and silty alluvium derived from mixed rock sources. Wholan soils are on inset fans and fan skirts. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 49 degrees F.

Taxonomic class: Coarse-silty, mixed, mesic Typic Camborthids

Typical pedon: Wholan very fine sandy loam, rarely flooded, 0 to 2 percent slopes:

A—0 to 5 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine and few fine and medium vesicular pores; moderately alkaline (pH 7.9); clear smooth boundary. (1 to 6 inches thick)

Bw1—5 to 14 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores;
moderately alkaline (pH 7.9); gradual smooth boundary. (4 to 13 inches thick)

Bw2—14 to 24 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; strongly alkaline (pH 8.6); gradual smooth boundary. (0 to 12 inches thick)

Bk1—24 to 38 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; slightly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (10 to 20 inches thick)

Bk2—38 to 60 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; slightly effervescent; few fine lime filaments; moderately alkaline (pH 8.4).

**Type location:** Pershing County, Nevada; in the southern part of Buffalo Valley, about 1,200 feet north and 2,200 feet west of the southeast corner of sec. 13, T. 28 N., R. 40 E.

**Range in Characteristics**

**Soil moisture:** Usually moist during the growing season; moist in winter and spring, dry from late May through October

**Soil temperature:** 47 to 53 degrees F

**Control section:** Content of clay—5 to 15 percent; texture—silt loam or very fine sandy loam having thin strata of loam or fine sandy loam in some pedons

**Depth to the Bk horizon:** 11 to 24 inches

**Reaction throughout the profile:** Moderately alkaline to very strongly alkaline, becoming more alkaline with depth

**Salt and sodium:** Not affected or slightly salt and sodium affected to a depth of 30 inches and moderately or strongly affected below that depth

**Other features:** Thin strata with as much as 5 percent very hard, firm, brittle durinodes one-half to three-quarters of an inch in size in the C horizon in some pedons

**A horizon:**

Value—5 to 7 dry, 3 to 5 moist (5 dry and 3 moist in the A1 horizon only)

Chroma—2 to 4

Structure—weak or moderate, very thin to medium platy or coarse subangular blocky

Consistence—soft or slightly hard

**Effervescence—noneffervescent or slightly effervescent**

**Bw horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 4

Structure—weak fine to coarse subangular blocky or medium or coarse prismatic; massive in some pedons

**Bk and C horizons:**

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Carbonates—few to many fine or medium veins and soft masses of lime in the Bk horizon; no segregated lime in the C horizon

Durinodes—as much as 5 percent in the substratum in some pedons

**Wiskan Series**

The Wiskan series consist of moderately deep, well drained, moderately slowly permeable soils that formed in residuum weathered from siliceous chert, argillite, and volcanic rocks. Wiskan soils are on side slopes of mountains. Slopes are 30 to 75 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Xerolic Haplargids

**Typical pedon:** Wiskan very gravelly loam, 30 to 50 percent slopes, in an area of Atlow-Wiskan association where pebbles cover about 35 percent, cobbles 15 percent, and stones 2 percent of the surface:

- **A1**—0 to 3 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and common fine and medium vesicular pores; 40 percent pebbles, 5 percent cobbles, 5 percent cobble, mildly alkaline (pH 7.8); clear smooth boundary. (2 to 4 inches thick)

- **A2**—3 to 9 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; 40 percent pebbles, 5 percent cobbles; few fine clay films on faces of peb; mildly alkaline (pH 7.8); clear smooth boundary. (2 to 7 inches thick)

- **Btk1**—9 to 13 inches; pale brown (10YR 6/3) very gravelly clay loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard,
Woolsey Series

The Woolsey series consists of very deep, somewhat excessively drained, moderately permeable soils that formed in mixed alluvium and lacustrine sediments. Woolsey soils are on fan piedmonts. Slopes are 2 to 8 percent. The mean annual precipitation is about 5 inches, and the mean annual temperature is about 52 degrees F.

Taxonomic class: Coarse-loamy, mixed, mesic Typic Hapludands

Typical pedon: Woolsey gravelly fine sandy loam, 2 to 8 percent slopes, in an area of Mazuma-Bluesing-Woolsey association where pebbles cover about 40 percent and cobbles 2 percent of the surface:

A1—0 to 2 inches; pale brown (10YR 6/3) gravelly fine sandy loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 15 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary. (1 to 3 inches thick)

A2—2 to 5 inches; pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 5/3) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; 15 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (1 to 5 inches thick)

A3—5 to 9 inches; pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 5/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine tubular pores; 15 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (2 to 12 inches thick)

Btk—9 to 14 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few medium roots; common very fine and few fine tubular pores; 15 percent pebbles; few thin clay films on faces of pebbles; few fine lime filaments; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (4 to 10 inches thick)

Bt—14 to 34 inches; pale brown (10YR 6/3) sandy loam that has a few thin, discontinuous strata of very gravelly loamy sand; brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 10 percent pebbles; few fine lime
filaments; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary. (10 to 30 inches thick)

Bk—34 to 60 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine tubular pores; 30 percent pebbles; common fine lime filaments; violently effervescent; strongly alkaline (pH 9.0).

Type location: Pershing County, Nevada; about 8 miles southwest of Lovelock, about 400 feet south and 200 feet west of the northeast corner of sec. 6, T. 25 N., R. 31 E.

Range in Characteristics

Soil moisture: Usually moist during the growing season; intermittently moist in winter and spring, dry from May through October

Soil temperature: 53 to 55 degrees F

Depth to the Bt horizon: 7 to 17 inches

Other features: Lacustrine sediments below a depth of 40 inches in some pedons

A horizon:
Hue—2.5Y or 10YR
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Structure—platy; single grain in some pedons
Consistence—loose, soft, or slightly hard
Effervescence—slightly effervescent or strongly effervescent

Bt horizon:
Hue—2.5Y or 10YR
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Content of clay—8 to 18 percent
Content of rock fragments—15 to 35 percent, mainly pebbles
Clay films—few or common, bridging pedds or lining some pores
Effervescence—slightly effervescent or strongly effervescent

Bk horizon:
Hue—2.5Y or 10YR
Value—6 or 7 dry, 4 or 5 moist
Chroma—2 or 3
Texture—stratified sandy loam or very gravelly sandy loam
Content of clay—3 to 10 percent
Content of rock fragments—10 to 35 percent, mainly pebbles
Structure—subangular blocky, platy, or single grain; massive in some pedons

Carbonates—few or common lime filaments
Effervescence—slightly effervescent to violently effervescent

Xine Series

The Xine series consists of moderately deep, well drained, moderately permeable soils that formed in residuum weathered from limestone and calcareous shale. Xine soils are on side slopes of mountains. Slopes are 30 to 75 percent. The mean annual precipitation is about 12 inches, and the mean annual temperature is about 44 degrees F.

Taxonomic class: Loamy-skeletal, mixed, frigid Aridic Calcixerolls

Typical pedon: Xine gravelly silt loam, 50 to 75 percent slopes, in an area of Puffer-Xine-Rock outcrop association where pebbles cover about 25 percent, cobbles 5 percent, and stones 1 percent of the surface:

A1—0 to 3 inches; brown (10YR 5/3) gravelly silt loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular and vesicular pores; 15 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary. (1 to 4 inches thick)

A2—3 to 10 inches; brown (10YR 5/3) gravelly silt loam, dark brown (10YR 3/3) moist; moderate very thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine tubular pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 12 inches thick)

Bk1—10 to 17 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine tubular pores; 20 percent pebbles, 15 percent cobbles; strongly effervescent; lime coatings on the underside of rock fragments; moderately alkaline (pH 8.4); clear smooth boundary. (4 to 10 inches thick)

Bk2—17 to 26 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and few coarse roots; many very fine tubular pores; 30 percent pebbles, 25 percent cobbles; violently effervescent; common fine lime filaments; lime coatings on all sides of rock fragments; moderately alkaline (pH 8.4); clear smooth boundary. (5 to 15 inches thick)

Bk3—26 to 38 inches; pale brown (10YR 6/3) very
cobble loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular pores; 20 percent pebbles, 25 percent cobbles, 1 percent stones; violently effervescent; lime coatings on all sides of rock fragments; moderately alkaline (pH 8.4); abrupt smooth boundary. (4 to 15 inches thick)

Cr—38 inches; weathered, fractured limestone.

**Type location:** Pershing County, Nevada; about 19 miles south of Winnemucca, in the East Range, about 1,950 feet south and 600 feet west of the northeast corner of sec. 28, T. 33 N., R. 37 E.

**Range in Characteristics**

**Soil moisture:** Usually moist during the growing season; moist from late fall through early summer, dry from July through October

**Soil temperature:** 44 to 46 degrees F

**Mollic epipedon:** 7 to 14 inches thick

**Depth to paralithic contact:** 20 to 40 inches

**Depth to the calcic horizon:** 10 to 25 inches

**Control section:** Texture—very cobbly loam or very cobbly sandy loam; content of clay—10 to 18 percent; content of rock fragments—35 to 60 percent, mainly cobbles; carbonates—25 to 40 percent calcium carbonate equivalent

**Other features:** The amount of secondary lime increasing with depth

**A horizon:**
- Value—mainly 4 or 5 dry, 2 or 3 moist; thin horizons with value of 6 dry in some pedons
- Chroma—2 or 3
- Reaction—mildly alkaline or moderately alkaline

**Bk horizon:**
- Value—5 to 7 dry, 3 to 5 moist
- Chroma—3 or 4
- Reaction—moderately alkaline or strongly alkaline

**Yipor Series**

The Yipor series consists of very deep, well drained, moderately permeable soils that formed in silty alluvium mixed with loess. Yipor soils are on inset fans, lake plain terraces, and stream terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-silty, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Yipor silt loam:

A1—0 to 2 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (1 to 4 inches thick)

A2—2 to 5 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (2 to 9 inches thick)

C1—5 to 17 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; many very fine and few fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary. (5 to 20 inches thick)

C2—17 to 36 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; few very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary. (15 to 30 inches thick)

C3—36 to 60 inches; very pale brown (10YR 7/4) silt loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Pershing County, Nevada; in Pleasant Valley, about 1,400 feet north and 1,350 feet west of the southeast corner of sec. 12, T. 29 N., R. 38 E.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods in winter and early spring

**Soil temperature:** 47 to 52 degrees F

**Control section:** Texture—silt loam or very fine sandy loam having thin strata of loam in some pedons; content of clay—8 to 18 percent

**Reaction throughout the profile:** Strongly alkaline or very strongly alkaline

**Effervescence:** Strongly effervescent to violently effervescent throughout the profile

**Salt and sodium:** Moderately or strongly saline-sodic affected in most pedons; not affected or slightly saline-sodic affected in the surface layer in some pedons

**A horizon:**
- Value—6 or 7 dry, 4 or 5 moist
- Chroma—2 or 3
C horizon:
Value—6 or 7 dry, 4, 5, or 6 moist
Chroma—3 or 4
Other features—strata of loamy sand below a depth
of 40 inches in some pedons; a horizon that has
5 to 15 percent lime concretions in the control
section in some pedons; gypsum crystals in the
lower part of the horizon in some pedons

Yobe Series

The Yobe series consists of very deep, somewhat
poorly drained, moderately permeable soils that formed
in lacustrine sediments derived from mixed rock
sources. Yobe soils are on alluvial flats and lake plains.
Slopes are 0 to 2 percent. The mean annual
precipitation is about 5 inches, and the mean annual
temperature is about 53 degrees F.

Taxonomic class: Fine-silty, mixed (calcareous), mesic
Aeric Halaquepts

Typical pedon: Yobe silt loam, occasionally flooded, 0
to 2 percent slopes, in an area of Wendane-Yobe
association:
A—0 to 3 inches; very pale brown (10YR 7/3) silt loam,
yellowish brown (10YR 5/4) moist; moderate very
thin platy structure; slightly hard, friable, slightly
sticky and slightly plastic; few fine roots; many very
fine and fine vesicular pores; strongly effervescent;
strongly alkaline (pH 8.8); abrupt smooth boundary.
(0 to 4 inches thick)
C1—3 to 14 inches; light gray (10YR 7/2) silt loam,
yellowish brown (10YR 5/4) moist; massive; slightly
hard, very friable, slightly sticky and slightly plastic;
common fine and medium roots; few very fine
tubular pores; strongly effervescent; strongly
alkaline (pH 8.8); clear smooth boundary. (6 to 15
inches thick)
C2—14 to 32 inches; very pale brown (10YR 7/3) silt
loam, yellowish brown (10YR 5/4) moist; massive;
slightly hard, friable, slightly sticky and slightly
plastic; few fine roots; few very fine tubular pores;
strongly effervescent; strongly alkaline (pH 8.6);
clear smooth boundary. (15 to 30 inches thick)
C3—32 to 52 inches; light gray (10YR 7/2) silty clay
loam, light yellowish brown (10YR 6/4) moist;
common fine distinct strong brown (7.5YR 5/8)
mottles; moderate thin platy structure; slightly hard,
friable, sticky and plastic; common fine tubular
pores; very few lime nodules; strongly effervescent;
strongly alkaline (pH 8.6); clear smooth boundary.
(10 to 30 inches thick)

Yobe Variant

The Yobe Variant consists of very deep, very poorly
drained, very slowly permeable soils that formed in
lacustrine sediments. Yobe Variant soils are on lake
plains. Slopes are 0 to 2 percent. The mean annual
precipitation is about 6 inches, and the mean annual
temperature is about 52 degrees F.

Taxonomic class: Fine, montmorillonitic (calcareous), mesic
Aeric Halaquepts

Typical pedon: Yobe Variant silty clay:
A1—0 to 2 inches; very pale brown (10YR 7/3) silty
clay, yellowish brown (10YR 5/4) moist; strong thin
platy structure; hard, friable, very sticky and very
plastic; few fine and very fine roots; many very fine
vesicular pores; violently effervescent; moderately
alkaline (pH 8.4); clear smooth boundary. (0 to 4
inches thick)
A2—2 to 8 inches; pale brown (10YR 6/3) silty clay, yellowish brown (10YR 5/4) moist; moderate very thin platy structure; hard, friable, very sticky and very plastic; few very fine and fine roots; many very fine tubular pores; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 7 inches thick)

Bk1—8 to 16 inches; pale brown (10YR 6/3) silty clay, yellowish brown (10YR 5/4) moist; few fine distinct strong brown (7.5YR 5/6) mottles; common fine dark yellowish brown (10YR 3/4) magnesium stains; massive; hard, friable, very sticky and very plastic; many fine and very fine roots; many fine tubular pores; violently effervescent; few fine soft masses of lime; moderately alkaline (pH 8.4); clear smooth boundary. (6 to 15 inches thick)

Bk2—16 to 24 inches; very pale brown (10YR 7/3) silty clay, brown (10YR 5/3) moist; few fine distinct strong brown (7.5YR 5/6) mottles; common fine dark yellowish brown (10YR 3/4) magnesium stains; weak thin platy structure; hard, firm, very sticky and very plastic; many fine and very fine roots; many fine and common medium tubular pores; strongly effervescent; many medium seams of lime; strongly alkaline (pH 8.6); clear smooth boundary. (6 to 20 inches thick)

C1—24 to 32 inches; very pale brown (10YR 7/4) silty clay, yellowish brown (10YR 5/4) moist; many medium distinct strong brown (7.5YR 5/6) mottles; moderate thin platy structure; hard, firm, slightly sticky and plastic; common very fine and few fine roots; many very fine and common medium tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary. (6 to 20 inches thick)

C2—32 to 60 inches; very pale brown (10YR 7/4) silty clay, yellowish brown (10YR 5/4) moist; moderate thin platy structure; hard, firm, slightly sticky and plastic; many fine and common medium tubular pores; strongly effervescent; moderately alkaline (pH 8.2).

Type location: Pershing County, Nevada; in Buena Vista Valley, about 500 feet east and 500 feet south of the northwest corner of sec. 32, T. 29 N., R. 36 E.

Range in Characteristics

Soil moisture: A water table at a depth of 0.5 foot to 1.5 feet for 1 month or more in most years; the capillary fringe moistening the soils to the surface

Soil temperature: 47 to 52 degrees F

Reaction throughout the profile: Moderately alkaline or strongly alkaline

Content of clay in the control section: 40 to 60 percent

A horizon:
  Value—6 to 8 dry, 5 or 6 moist
  Chroma—2 to 4

Bk and C horizons:
  Value—6 or 7 dry, 5 or 6 moist
  Chroma—3 or 4
Formation of the Soils

Soil is a natural body on the earth's surface that is capable of supporting plants. It is a mixture of varying proportions of rocks, minerals, organic matter, water, and air. The rocks and minerals are fragmented and are partly or wholly weathered. Each soil has distinctive layers, or horizons, that are the product of environmental forces acting upon material deposited or accumulated through geologic activity.

Soils differ from one another in different localities and within short distances. Differences are the result of the interaction of five soil-forming factors. These factors are climate, mainly temperature and precipitation; relief, mainly as it affects internal and external soil properties, such as drainage, aeration, susceptibility to erosion, and exposure to sunlight and the wind; biological forces, mainly the plant cover and the organisms living in and on the soil; parent material, including its texture and structure and its mineralogical and chemical composition; and the length of time that the soil-forming factors have been acting on the soil material.

The landscape of the survey area is made up mainly of mountains and valleys that are the result of geologic stratigraphic and structural control (9). The present topography and landforms, however, are primarily the result of events during Quaternary time. The kinds of soil that formed are indicative of the stability and age of the surfaces of the landforms on which the soils occur.

Climate

The climate of the survey area is characterized by warm, dry summers and cool, moist winters. The average annual precipitation ranges from about 6 inches at the lowest elevations of Buena Vista Valley and the lower reaches of the Humboldt River near Lovelock to 16 inches or more at the highest elevations in the Tobin Range to the east and the Humboldt Range to the west. The average annual air temperature ranges from about 52 degrees F at the lower elevations to about 41 degrees F or lower in some of the high mountain ranges. Major climatic variations are the result of the effects of topography and relief. Temperature decreases with increasing elevation. The amount of precipitation increases with increasing elevation. It is highest in the mountainous areas. The soils in the survey area reflect a general zonation with respect to elevation and longitudinal location.

At elevations of 3,900 to 5,000 feet in the survey area, the average annual precipitation is about 4 to 8 inches. In this arid part of the area, weathering of parent material is slow, leaching is incomplete, and eluviation and illuviation proceed at a very slow rate. The plant cover is sparse and consists mainly of drought- and salt-tolerant shrubs. Typically, the soils are low in organic matter content and have a thin, light colored A horizon. Soluble salts and calcium carbonate accumulate in the soils at a relatively shallow depth. Jerval soils and other Duric Natargids, Weso soils and other Duric Camborthids, and Bubus soils and other Durothidic Torriorthents reflect the type of soil formation in this climatic zone.

At the mid elevations in the survey area, the average annual precipitation is about 10 inches. This greater amount of precipitation results in deeper leaching of salts and calcium carbonate, decreased reaction, changes in the kind and density of vegetation, and a thicker, darker A horizon. Bliss soils and other Haploxerollic Durothids, Enko and Orovada soils and other Durixerollic Camborthids, and Snapp soils and other Durixerollic Natargids are typical of the soils that formed at these elevations.

At the highest elevations, which reach about 9,800 feet, the average annual precipitation is 12 to more than 16 inches. Leaching of salts and carbonates is more intensive than is typical at the lower elevations, and the soils are neutral or slightly acid and have a thick A horizon that is high in organic matter content. Iver soils and other Pachic Haploxerolls, Harcany soils and other Pachic Cryoberolls, and Tusel soils and other Argic Pachic Cryoberolls are typical of the soils that formed at these elevations.

In winter, freezing and thawing generally occur throughout the survey area, except for areas that generally are insulated by a snow cover. The effects of frost action include the heaving of plants, the development of miniature stone rings, and erosion of
the surface soil. At some of the higher elevations, freezing and thawing have fractured and displaced the bedrock.

Relief

Through its effects on drainage, runoff, erosion, and exposure to sunlight and the wind, relief has had an important effect on soil formation in the survey area. The mountain ranges, valleys, and flood plains reflect the gross variations in relief within the area.

The mountain ranges are characterized mainly by excessive relief. Runoff is rapid or very rapid, and the hazard of erosion is high. The removal of material by erosion inhibits or prevents soil formation. Soil formation on unstable mountain surfaces that are subject to a high rate of geologic erosion is limited primarily to the accumulation of organic matter, which results in the formation of a dark colored A horizon. A cambic horizon or an argillic horizon has formed in the soils on the more stable mountain surfaces, where the rate of geologic erosion has been slower. Millerlux soils and other Lithic Xeric Haplargids and Golsum soils and other Aridic Calcic Argixerolls are examples of soils that formed on the more stable mountain slopes and have an argillic horizon. Wereld soils and other Aridic Calciixerolls are examples of soils that have a calcic horizon. Hopeka, Puffer, and Sumya soils and other Lithic Xeric Torriorthents are examples of soils on the less stable mountain slopes where soil formation has been unable to act on the parent material long enough for the development of a calcic or argillic horizon.

Concave and north-facing mountain slopes commonly have pockets where snow remains into late spring and early summer. The effect of temperature and moisture is enhanced in these areas, resulting in dense stands of shrubs and grass. The soils in these areas have a thick, dark colored A horizon that is high in content of organic matter. Iver soils and other Pachic Haploxerolls are examples.

The valleys in the survey area are largely semibosons or bolsons (16) that receive drainage water primarily from the surrounding mountain ranges. They are characterized by a series of level or nearly level basin floors bordered by piedmont slopes consisting of alluvial fans, fan skirts, and fan piedmonts. The material in the valleys is Tertiary-Quaternary valley fill. Small playas or intermittent lakes are in Buena Vista Valley and Buffalo Valley.

In the Antelope Valley area, stream erosion has dissected parts of the valley fill. Downcutting of the valleys, which has been interrupted several times, is marked by the development of fan piedmonts. The dissection patterns in some of these areas have resulted in fan piedmont remnant summits and side slopes with inset fans and flood plains along drainageways. The fan piedmont areas have been relatively stable over a long period as a result of the bypassing of drainage water from hills and mountains through dissecting channels. Beoska soils and other Duric Natargids, Cortez and Gwen soils and other Xerolic Natadurargids, and Bliss, Eastwell, and Shablis soils and other Haploxerolic Durorthids are examples of soils on stable fan piedments. Enko and Orova soils and other Durixerolic Camborthids and Humboldt soils and other Fluvaqueuistic Haplaquolls are examples of soils on inset fans and flood plains.

Associated with the valleys are low hills bordering the mountains. These hills are strongly dissected and consist of low hill crests and side slopes. Singatse soils and other Lithic Torriorthents and Theon soils and other Lithic Haplargids are examples of soils on the low hills.

Level and nearly level lake plains and alluvial flats in Buena Vista Valley are remnants of Pleistocene lakes or terminal points of drainageways. Runoff is slow, and drainage is somewhat restricted. The soils in these areas are light colored and contain soluble salts. Argenta and Wendane soils and other Aeric Halaquepts, Chunall soils and other Typic Torriorthents, and Batan soils and other Durorthic Torriorthents are examples.

Nearly level soils on axial stream flood plains along the Humboldt River have a high water table. Runoff is very slow, and some of the soils are subject to flooding. These areas support dense stands of meadow vegetation, which has contributed a large amount of organic matter to the soils, resulting in a dark colored A horizon. Humboldt soils and other Fluvaqueuistic Haplaquolls are examples of the soils in these areas. In some areas where stream channels commonly are entrenched, the water table is at a greater depth.

Biological Forces

Plants, animals, insects, and microflora are important biological forces that affect soil formation in the survey area. Although animals, such as badgers and ground squirrels, and cicadas and other insects have had some effect on soil formation, plants appear to have been the major biological influence on the soils in the survey area.

The vegetation in the survey area has been particularly important because it reduces the hazard of erosion. It has helped to maintain the stability of the land surfaces so that normal soil formation could take place.

Because of climatic differences, plants vary considerably in kind and amount with differences in
elevation. On alluvial flats, lake plains, and fan piedmonts at low elevations, the main plants are drought- and salt-tolerant shrubs and grasses. Because of a scarcity of available moisture, plants cover only a small part of the surface. Therefore, very little organic matter is added to the soil and the scarcity of plants or litter provides little protection from the wind and sunlight. This condition is common in areas of Wendane soils and other Aeric Hałaquepts and in areas of Bubus soils and other Durorthidic Torriorthents. Salt-tolerant shrubs tend to recycle salts from the deeper layers to the surface soil.

On the flood plains where drainage is restricted, the soils support dense meadow vegetation. This vegetation has supplied the organic matter that results in a thick, dark colored A horizon in Humboldt soils and other Fluvaqueptic Haplaquolls.

The fan piedmonts and low hills at the higher elevations support a plant cover of shrubs and grasses that is transitional from desert shrubs. The density of the plants is somewhat greater than that in other areas, soluble salts are deeper in the soil profile, and the A horizon of the soils has accumulated slight or moderate amounts of organic matter, depending on the stability of the surface. Cortez and Gwena soils and other Xerolic Nadurargids and Burrita soils and other Lithic Xerolic Haplaquolls are examples of these soils.

The mountainous areas support denser stands of shrubs, grasses, and, in places, trees. Because of the more abundant vegetation, the A horizon in many of the soils, such as Harcany soils and other Pachic Cryoborolls, is thick, high in content of organic matter, and dark colored.

**Parent Material**

Parent material is the weathered rock or unconsolidated material in which soils form. The hardness, grain size, and porosity of the parent material and its mineralogical and chemical composition greatly influence soil formation. The main kinds of parent material in the survey area are residuum derived from intrusive and extrusive igneous rocks and sedimentary rocks, colluvium, alluvium, lacustrine sediments, and eolian material, including loess and volcanic ash. Minor amounts of metasedimentary and metavolcanic rocks are common in local areas.

The igneous rocks in parts of the East, Humboldt, Stillwater, Tobin, and West Humboldt Ranges include andesite, rhyolite, and granitic rocks. The more siliceous rocks, particularly tuff, are a source of silica, which helps to cement soil horizons. Volcanic rocks contain appreciable quantities of minerals that weather to clay. As a result, most of the soils that formed in material weathered from volcanic rocks and that are on sufficiently stable landforms for long periods have an argillic horizon. Ayan soils and other Aridic Argixerolls, Cleavage soils and other Lithic Argixerolls, Snowmore soils and other Xerolic Durargids, and Trunk soils and other Xerolic Haplargids are examples.

Colluvium has accumulated on steep mountain slopes as a result of gravitational forces. It generally is poorly sorted, contains many rock fragments, and has minerals that weather to clay. Many of the colluvial landscapes in the survey area have not been stable long enough for the development of an argillic horizon. Liver soils and other Pachic Haploargids are examples of soils in these colluvial areas.

Paleozoic and Mesozoic sedimentary and metasedimentary rocks dominate all of the mountain ranges in the survey area, including the Augusta Mountains and the East, Humboldt, Sonoma, Stillwater, Tobin, and West Humboldt Ranges. These rocks consist of relatively thick sequences of argillite, chert, shale, siltstone, sandstone, quartzite, conglomerate, dolomite, and limestone. The soils that formed in material weathered from these rocks include Polum soils and other Calcic Pachic Cryoborolls, which have a calcic horizon, and Hopeka, Kram, and Sumya soils and other Lithic Xeric Torriorthents, which are shallow, undeveloped soils on unstable land surfaces where an argillic horizon has not formed.

Late Tertiary and early Quaternary semiconsolidated, dissected deposits of gravel are mainly in the northern part of Buena Vista Valley, on the eastern side of Grass Valley, and in the northern part of the Humboldt Range, adjacent to the mountains. These deposits consist mainly of older alluvium made up of metasedimentary, igneous, and volcanic rocks in a matrix of tuff, sand, clay, and silt. Pocan soils and other Xerolic Camborthids, Chiara soils and other Xerolic Durorthids, and Knott soils and other Typic Nadurargids are examples of soils in areas of these deposits.

Alluvium deposited on piedmont slopes and basin floors consists of sandy, loamy, and clayey material of generally mixed mineralogy. This material has been eroded from the surrounding hills and mountains.

Alluvium derived from mixed rock sources on fan piedmonts, fan collars, fan aprons, and inset fans generally is loamy and contains pebbles, cobbles, and stones. It is porous and contains minerals that weather to clay and soluble silica, which helps to cement duripans. Cortez soils and other Xerolic Nadurargids and Cleaver soils and other Typic Durargids are examples of soils that are characterized by an argillic horizon and silica cementation and that formed on stable fan piedmonts. Whirlo soils and other Typic Cambolithids are examples of soils that have a cambic
horizon and that formed on fan collars. Enko soils and other Durixerollic Camborthids are examples of soils that are characterized by a cambic horizon and weak silica cementation and that formed on fan aprons.

Alluvium deposited on fan skirts, alluvial flats, and flood plains below the fan piedmonts consists of sandy, loamy, silty, and clayey material. Soluble salts are common in some of the soils in these areas. Although the alluvium contains weatherable minerals, the soils on these landforms are young and do not exhibit evidence of soil formation. Preble soils and other Aquic Durorththic Torriorthents, Wendane soils and other Aerlic Halaquepts, and Humbold soils and other Fluvaquentctic Haplauquolls are examples.

Volcanic ash presumed to be derived from Mount Mazama ash falls has been a source of silica, which has been instrumental in the formation of durinodes and duripans in the soils of the survey area. The ash has been preserved in some of the soils on fan skirts, inset fans, and alluvial flats and on flood plains, such as those along the Humboldt River. It occurs as thin strata. Dun Glen soils and other Typic Camborthids on fans skirts and Wendane soils and other Aerlic Halaquepts on alluvial flats and lake plains are examples of soils influenced by volcanic ash.

Loess consisting mainly of silt was deposited over the entire survey area during the late Pleistocene and the Holocene. This material originated in the dry lake basins west of the survey area. Much of the loess was deposited on mountain slopes and was subsequently redeposited by water in the valleys as silt loam and very fine sandy loam alluvium. The influence of loess is apparent in the upper horizons in most of the soils that formed on fan piedmont remnants, fan collars, fan skirts, and inset fans. Examples are Beoska and Oxcord soils and other Duric Natargids on fan piedmont remnants and Whirlo and Wholan soils and other Typic Camborthids on inset fans, fan collars, and fan skirts.

Sandy eolian material is of limited extent in the survey area. It is mainly adjacent to Rye Patch Reservoir and in Buena Vista Valley. Sandy soils, such as Hawsley soils and other Typic Torripsamments, formed on low, stabilized dunes and sand sheets associated with beach terraces. Isolde soils and other Typic Torripsamments are in wind-active areas of semistabilized dunes superimposed over beach terraces.

Time

Time is required for the formation of soil horizons. The amount of time required depends on the other soil-forming factors. The thickness and other characteristics of A, B, and other horizons reflect the relative age of the soils. The age or degree of expression of the soil horizons reflects the amount of the weathering of parent material resulting from the interaction of moisture, temperature, and biological activity as influenced by time.

The soils in this survey area range from a few years to tens of thousands of years old. This range in age is a major reason for the many kinds of soil in the area.

The interrelationships between time and the other soil-forming factors are not well understood by soil scientists and geologists working in this field. Many soil scientists and some geologists think that weathering of parent material and soil profile development have been essentially continuous and that their rates have changed little throughout the Quaternary (14, 15, 18, 23). Recently, geologists differentiating Quaternary deposits have proposed that soil formation has not proceeded continuously at the same rate but has taken place intermittently at rapid rates (11, 12, 13, 17). These geologists have developed a technique of mapping soil stratigraphic units in which weathering profiles are used as stratigraphic markers to differentiate and correlate Quaternary deposits. The concept of soil formation is based on the assumption that weathering profiles formed in response to infrequent combinations of climatic factors that induced minimal erosion and deposition and a greatly accelerated rate of chemical weathering.

Although there are disagreements about the relative influence of time and other soil-forming factors, the concept of the intermittency of soil formation has been supported by numerous studies and provides a practical technique to discuss the age of the soils in this survey area in terms of geologic and climatic factors in the Quaternary. The time-stratigraphic names used in this discussion are those of Birkeland (3). They are Holocene (0 to 10,000 years ago), Late Wisconsin (10,000 to 30,000 years ago), Middle Wisconsin (30,000 to 40,000 years ago), Early Wisconsin (40,000 to 130,000 years ago), and pre-Wisconsin (130,000 or more years ago).

The kinds of diagnostic subsurface horizons and other diagnostic subsurface properties (20), together with their strength of expression, provide general clues to the age of the soils in the survey area. The important diagnostic subsurface horizons of the soils in the area are the argillic, natric, and cambic horizons and horizons exhibiting silica cementation.

Prominent argillic horizons in this survey area are generally only in soils that formed primarily during Wisconsin and pre-Wisconsin time. This concept has been established by studies in the Southwest (5, 6) and is further supported in "Soil Taxonomy" (20). If soil-
forming conditions remain constant, argillic horizons
become finer in texture with increasing age, become
somewhat thicker, and tend to develop abrupt upper
boundaries. Weakly expressed, thin argillic horizons
may have formed during Late Wisconsin or Early
Holocene time.

Natric horizons are special kinds of argillic horizons
that formed under the influence of a high content of
exchangeable sodium. The effect of sodium on the
dispersion of clay may tend to accelerate the rate at
which argillic horizons form. This acceleration is
believed to be significant only in weakly expressed
natric horizons that formed on Holocene surfaces.
Following the formation of argillic horizons, prominent
natric horizons may have developed their present
characteristics as a result of sodium supplied by the
deposition of eolian material. This important present-day
process affects the physical and chemical properties of
the soils in the survey area.

The volcanic glass in sediment derived from
pyroclastic material and in alluvial and eolian deposits
of volcanic ash is a source of silica, which is important
in the formation of duripans and durinodes in many of
the soils in the survey area. Duripans are massive or
platy horizons that are cemented with silica and in most
areas with accessory carbonates. Because of their
association with prominent argillic horizons, massive
duripans capped with silica- and lime-cemented laminar
layers are assumed to be the oldest duripans in the
survey area. They are of pre-Wisconsin age. Thin
duripans that are not characterized by overlying laminar
layers or by weak, discontinuous silica cementation or
durinodes have apparently developed on Holocene
surfaces, in areas of loess or loamy alluvium generally
deposited on gravelly material. These kinds of silica
cementation apparently can occur during a relatively
short period and are probably less than 7,000 years old.

The degree of development of diagnostic subsurface
horizons in the soils of the area indicates a sequence
that ranges in age from late Holocene to pre-Wisconsin.
The youngest soils in the survey area are those that
formed in recently aggraded material or in material that
has been recently exposed by erosion. Among these
are Mazuma soils and other Typic Torriorthents, Needle
Peak soils and other Aquic Torriorthents, and Sonoma
soils and other Aeric Fluvaquents, all of which formed in
recent alluvium; Daicik soils and other shallow Typic
Torriorthents, which formed in Tertiary sediments on
low hills where geologic erosion has been active; and
Isolde soils and other Typic Torriorthents, which are
subject to eolian activity on semistabilized sand dunes.

Soils that formed in alluvium on wet flood plains and
on recently eroded mountain slopes are somewhat older
than the youngest soils. The older soils have been
stable long enough for the accumulation of organic
matter and the formation of a dark colored A horizon.
They do not have an argillic, natric, cambic, or calcic
horizon, a duripan, or a durinode. They are probably less
than 1,000 years old. Humboldt soils and other
Fluvaquentic Haplauquolls are examples of soils that
formed on wet flood plains. Linrose soils and other
Arodic Haploxerolls and Harcy soils and other Pachic
Cryoborolls are examples of soils that formed on
mountain slopes.

Soils that formed in alluvium on alluvial flats and that
have subsurface horizons containing durinodes or
horizons characterized by very weak silica cementation
are older than the youngest soils and may be slightly
older than the soils that have a dark colored A horizon
as their only diagnostic feature. The soils on the alluvial
flats formed in salt- and sodium-affected parent material
containing appreciable amounts of volcanic ash. The
volcanic ash, which is a source of soluble silica, and
alkaline soil reaction probably contribute to relatively
rapid formation of durinodes and incipient silica
cementation. Preble soils and other Aquic Durorthic
Torriorthents and Wendane soils and other Aeric
Halaquepts are examples of soils that have horizons
characterized by incipient silica cementation.

Stable Holocene surfaces less than about 10,000
years old and more than 2,000 years old are extensive
in the survey area. The soils that formed on these
surfaces have a cambic horizon. Most of the cambic
horizons in the soils of the survey area formed in
calcareous alluvium. The original stratification is not
evident, and carbonates have been removed and
redeposited in the underlying horizons.

Investigations in southern New Mexico indicate that
cambic horizons in that region are less than about
5,000 years old (4, 7). Cambic horizons in this survey
area and in other areas in Nevada generally have been
thought to be less than 10,000 years old and possibly
less than 7,000 years old. This age has been
determined mainly through soil mapping in areas below
the last high stage of Pleistocene Lake Lahontan (8, 11,
12, 13). Examples of soils that have a cambic horizon
are Toulon soils and other Typic Camborthids on barrier
and offshore bars; Enko and Orovida soils and other
Durixerollic Camborthids on inset fans, fan aprons, and
fan skirts; and Pocan soils and other Xerollic
Camborthids on the side slopes of mountains.

In some of the less stable areas, the landscape was
stripped by erosion during Late Wisconsin time and
relict duripans were exposed. Following redeposition
during the middle and early Holocene, loess and loamy
alluvium derived from the surrounding land surfaces
covered these relict subsurface horizons to a shallow
depth. Soil formation in the surface alluvium is minimal.
Examples of soils that have a duripan are Adelaide soils and other Entic Durorthids, Sodhouse soils and other Typic Durorthids, and Chiara soils and other Xerollic Durorthids, all of which are on fan piedmont remnants. Soils that have a relict argillic horizon are believed to be of Late Wisconsin to pre-Wisconsin age. They are extensive on mountains, hills, and fan piedmonts. The current extent of these soils is evidence that major erosional and depositional events have not taken place or have been minor in extent since late Pleistocene time.

Stable Early, Middle, or Late Wisconsin surfaces are extensive in the survey area. The soils on these surfaces have a dominantly fine-loamy or loamy-skeletal argillic or natric horizon. Biddleman soils and other Typic Natargids are examples of soils that have a natric horizon and are on beach terraces. Woolsey soils and other Typic Haplargids are examples of soils that have an argillic horizon and are on fan piedmonts. Beoska soils and other Duric Natargids are examples of soils that have a natric horizon and are on fan piedmonts. Burrita soils and other Lithic Xerollic Haplargids are examples of soils that have an argillic horizon and are on the side slopes of hills and mountains. Alian soils and other Aridic Argixerolls are examples of soils that have an argillic horizon and are on plateaus. Reluctan soils and other Aridic Argixerolls are examples of soils that have an argillic horizon and are on the side slopes of mountains.

A thin or moderately thick duripan formed in some of the soils that have an argillic or natric horizon and are on the older landscapes in the survey area. Examples are Dewar soils and other Xerollic Durargids on fan piedmonts, Tenabo soils and other Typic Nadurargids on fan piedmonts, and Pirouette soils and other Typic Nadurargids on plateaus. The duripan in the Pirouette soils is underlain by bedrock.

The soils on stable Early Wisconsin or Early and Middle Wisconsin surfaces have a well developed, fine textured argillic or natric horizon. They are on the older surfaces where the original subsurface horizons have not been stripped by erosion or deeply buried by recent alluvium. Examples are Chilper and Oxcorel soils and other Duric Natargids and Cortez soils and other Xerollic Nadurargids on fan piedmonts and Gosumi soils and other Aridic Argixerolls and Ninemile soils and other Lithic Argixerolls on mountain slopes and plateaus.
References


Glossary

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted. (See Sodicity.)

**Alluvial fan.** A semiconical, or fan-shaped, constructional major landform that is mainly stratified alluvium with debris flow deposits in some areas. It is on the upper margin of a piedmont slope, and its apex is a source of alluvium debouching from a mountain valley into an intermontane basin. Also, a generic term for similar landforms in various other landscape positions.

**Alluvial flat.** The nearly level alluvial surface between a piedmont slope and the playa of a bolson or the axial stream flood plain of a semibolson. This landform can include both recent and relict components.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Animal unit month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**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.

**Back slope.** The slope component that is the steepest, straight to concave or merely concave, middle portion of an erosional slope.

**Badland.** Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

**Ballena.** A major landform comprising distinctively round-topped ridgeline remnants of fan alluvium. The broadly rounded shoulders of the ridge meet from either side to form a narrow crest and merge smoothly with the concave back slopes. In ideal examples, the slightly concave foot slopes of adjacent ballenas merge to form a smoothly rounded drainageway.

**Bar (offshore and barrier).** A component landform comprised of elongated, commonly curving, low ridges of well sorted sand and gravel that stand above the general level of a bolson floor. It is the result of the wave action of a Pleistocene lake.

**Basal area.** The area of a cross section of a tree. It is a measure of stand density, commonly expressed in square feet. For pinyon pine and juniper stands, it is the section at a height of 1 foot and measured outside the bark.

**Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

**Basin.** A general term for an intermontane basin, a bolson, a semibolson, an area of centripetal drainage, or a structural depressional area.

**Basin floor.** The lowermost, nearly level major physiographic part of a bolson or semibolson. It includes all alluvial, eolian, and erosional landforms that are below the piedmont slopes.

**Basin floor remnant.** A generally flat-topped erosional remnant of a basin floor that has been dissected by an axial stream.

**Beach plain.** A major landform of bolson floors comprised of numerous closely spaced offshore
bars and intervening lagoons. It is the result of a receding Pleistocene lake.

**Beach terrace.** A component landform occurring on the lower piedmont slope and consisting of a wave-cut scarp and a wave-built terrace of well sorted sand and gravel marking a stillstand of a Pleistocene lake.

**Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

**Bolson.** An internally drained intermontane basin.

**Bolson floor.** See Basin floor.

**Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.

**Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

**Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

**Canopy.** The leafy crown of trees or shrubs. (See Crown.)

**Channel.** The bed of a single or braided waterway that commonly is barren of vegetation. Channels form in young alluvium. They may be enclosed by banks, or they may be splayed across a fan surface and slightly mounded above it. They may include bars and dumps of cobbles and stones. Nearly all channels, except for flood plain playas, are landform elements.

**Chemical treatment.** Control of unwanted vegetation through the use of chemicals.

**Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Clay 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.

**Coarse textured soil.** Sand or loamy sand.

**Cobble (or cobbles).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

**Cobbly soil material.** Material that contains a specified amount of rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Terms for the amount of these fragments, by percentage of the total volume, are as follows:

- Cobble: 15 to 35 percent
- Very cobble: 35 to 60 percent
- Extremely cobble: more than 60 percent

**Colluvium.** Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

**Complex 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.

**Component landform.** A feature of the earth's surface that is part of a major landform and was created by partial dissection of the major landform or by alluvial or eolian accretion. A component landform is the smallest type of landform that can be described as a single unit. Its morphological parts are called landform elements. A side slope element can be subdivided into slope components.

**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.

**Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Consistence, soil.** The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

- **Loose.**—Noncoherent when dry or moist; does not hold together in a mass.
- **Friable.**—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
- **Firm.**—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coppice dune. A small dune of fine grained soil material stabilized around shrubs or small trees.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crest. The slope component comprising a very narrow, commonly linear top of an erosional ridge, hill, mountain, or other landform.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Desert pavement. On a desert surface, a layer of gravel or larger fragments that was emplaced by upward movement of the underlying sediment or that remains after finer particles have been removed by running water or the wind.

Desert varnish. A glossy sheen or coating on stones and gravel in arid regions.

Dissection. The partial destruction of a land surface or landform by gully, arroyo, canyon, or valley cutting, leaving flattish remnants or ridges, hills, or mountains separated by drainageways.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—These soils have very high and high hydraulic conductivity and a low water-holding capacity. They are not suited to crop production unless irrigated.

Somewhat excessively drained.—These soils have high hydraulic conductivity and a low water-holding capacity. Without irrigation, only a narrow range of crops can be grown and yields are low.

Well drained.—These soils have an intermediate water-holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.

Moderately well drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or yields of some field crops are adversely affected unless a drainage system is installed. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.

Somewhat poorly drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless a drainage system is installed. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

Poorly drained.—These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.

Very poorly drained.—These soils are wet to the surface most of the time. The wetness prevents the growth of important crops (except for rice) unless a drainage system is installed.

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.

Effervescence. A soil quality measured when drops of diluted (1:10) hydrochloric acid (HCl) are added to the soil. The degrees of effervescence are as follows:

Very slightly effervescent .......... few bubbles
Slightly effervescent ............. bubbles readily
Strongly effervescent .... bubbles form low foam
Violently effervescent ........ bubbles form thick foam quickly

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth’s surface.

Fan apron. A component landform consisting of a sheetlike mantle of relatively young alluvium that partially covers the surface of an older fan piedmont or, in places, an alluvial fan. A fan apron buries a pedogenic soil.

Fan collar. A component landform comprised of a thin, short, relatively young mantle of alluvium along the very upper margin of a major alluvial fan at a mountain front. The mantle somewhere buries a pedogenic soil that can be traced to the edge of the fan collar, where it emerges as the land surface, or relict soil.

Fan piedmont. The most extensive major landform of most piedmont slopes. It is formed by the lateral coalescence of mountain-front alluvial fans into one generally smooth slope and by accretion of fan aprons. Fan piedmonts commonly are complexes of many component landforms.

Fan remnant. A generic term for a component landform that is the remainder of various older fans that have been dissected (erosional fan remnants) or partially buried (nonburied fan remnants). Erosional fan remnants have a flattish summit that consists of a relict fan surface; nonburied fan remnants consist entirely of a relict fan surface. Fan remnants can be specifically identified by such terms as fan piedmont remnants, fan skirt remnants, and inset fan remnants.

Fan remnant side slope. A landform element comprised of the relatively young erosional slope around the sides of an erosional fan remnant. It is composed of shoulders, back slopes, and foot slopes.

Fan skirt. A major landform comprised of laterally coalescing, small alluvial fans that originate from gullies that are cut into or extend from inset fans of a fan piedmont and merge along their toe slopes with the basin floor. Fan skirts are smooth or only slightly dissected.

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.

Fine textured soil. Sandy clay, silty clay, or clay.

Flood plain. The transversely level floor of an axial stream of a semibosion or of a major desert stream valley that is occasionally or regularly alluviated when the stream overflows its channel during periods of flooding.

Flood plain playa. A component landform consisting of very low gradient, barren, axial stream segments in an intermontane basin. It is subject to broad and shallow floods and is veneered with barren, fine textured sediment that crusts. A flood plain playa commonly is segmented by transverse, narrow
bands of vegetation, and it may alternate with ordinary, narrow or braided channel segments.

**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.

**Foot slope.** The relatively gently sloping, slightly concave slope component of an erosional slope that is at the base of the back slope component. Synonym: pediment.

**Forb.** Any herbaceous plant not a grass or a sedge.

**Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

**Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

**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 contains a specified amount of rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter. Terms for the amount of these fragments, expressed as a percentage of the total volume, are as follows:
- Gravelly: 15 to 35 percent
- Very gravelly: 35 to 60 percent
- Extremely gravelly: more than 60 percent

**Hard bedrock.** Bedrock that cannot be excavated except by blasted or by the use of special equipment that is not commonly used in construction.

**Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by silica or calcium carbonate.

**Hemic soil material (mucky peat).** Organic soil material intermediate in degree of decomposition between the less decomposed fibrile 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 number, commonly a 2, precedes the letter C.
- **Cr horizon.—** Soft, consolidated bedrock beneath the soil.
- **R layer.—** Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors of predicting runoff. The four hydrologic 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 permanent 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.

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.

Inset fan. The flood plain of a commonly ephemeral stream that is confined between fan remnants, basin floor remnants, ballenas, or closely opposed fan toe slopes. Its transversely level cross section is evidence of alluviation of a fluve. It is wide enough that raw channels cover only a fraction of its surface.

Interfluve. The elevated area between two fluvial (drainageways) that sheds water to them.

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.

Irrigation. Application of water to soils to assist in production of crops.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lagoon. A metaphorical term for the ponding area behind Pleistocene offshore or barrier bars (beaches) that collects fine textured sediments.

Lake plain. A major landform of some bolson floors that is nearly level and consists of fine textured, stratified bottom sediment of a Pleistocene lake.

Lake plain terrace. A somewhat elevated area and component landform of a lake plain.

Landform element. The morphological part of a component landform. Side slope landform elements may be divided into slope components.

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.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Major landform. A subdivision of the piedmont slope or basin floor that reflects a major morphogenetic process taking place over a long period or that is the result of a special erosional or depositional process. Many major landforms are dissected, and their original area is occupied by component landforms.

Major physiographic part. The very large part of an intermontane basin that is characterized by dominant slope and position and is comprised of major landforms (i.e., steeply sloping mountains that stand above less sloping piedmonts that in turn grade to nearly level basin floors).

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

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.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistency, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—few, common, and many; size—fine, medium, and coarse; and contrast—faint, distinct, and prominent. The size measurements are of the diameter along
the greatest dimension. Fine indicates less than 5 millimeters (about 0.2 inch); medium, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

**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 and a surface of considerably bare rock. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

**Mountain valley fan.** A major landform that is the result of alluvial filling of a mountain valley or intramontane basin by coalescent valley side slope fans, the toe slopes of which meet from either side of the valley along an axial drainageway. It is an extension of the upper piedmont slope into mountain valleys. Most mountain valley fans have been dissected.

**Mudstone.** Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

**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 between 6.6 and 7.3. (See Reaction, soil.)

**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.

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, hardpan and claypan.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Parna dune.** An eolian dune made up of sand-sized aggregates of clayey material that commonly occurs leeward of a playa.

**Partial ballena.** A spur that has a fully rounded crest and that is connected to an erosional fan remnant large enough that some relict fan surface is preserved on the remnant summit.

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pediment.** The foot slope component of an erosional slope.

**Pedon.** The smallest volume that can be called "a soil."

A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.

**Permeability.** The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

- Very slow .................. less than 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. For example, slope, stoniness, and thickness.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Piedmont.** A general slope rising to mountains.

**Piedmont slope.** A major physiographic part of an intermontane basin that comprises all of the constructional and erosional major and component landforms from the basin floor to the mountain front and on into alluvium-filled mountain valleys.

**Piping.** Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

**Plain.** A flat, undulating, or rolling area, large or small, that includes few prominent hills or valleys. It generally is at a low elevation in relation to surrounding areas, and it may have considerable overall slope and local relief.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plateau.** An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

**Playa.** An ephemeral flooded, barren area on a basin floor that is veneered with fine textured sediment and acts as a temporary or final sink for drainage water.

**Ponding.** Standing water on soils in closed depressions. Unless a drainage system is
installed, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. The application of fire to land under such conditions of weather, soil moisture, and time of day as presumably will result in the intensity of heat and spread required to accomplish specific forest management, wildlife, grazing, or fire hazard reduction purposes.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to

pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid ........................................... below 4.5
Very strongly acid ....................................... 4.5 to 5.0
Strongly acid ........................................... 5.1 to 5.5
Medium acid ........................................... 5.6 to 6.0
Slightly acid ........................................... 6.1 to 6.5
Neutral .................................................. 6.6 to 7.3
Mildly 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

Relict. Old, or remaining from previous times; in the present context, of Pleistocene age.

Relief. The elevations or inequalities of a land surface, considered collectively.

Remnant. The remainder of a larger landform or of a land surface that has been dissected or partially buried.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Ridgeline remnant. A narrow ridge that has a fully rounded crest and is accordant with the crests of similar nearby ridges. Together, the accordant crests approximately mark the position of a preexisting land surface that has been destroyed by dissection.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water. Six classes of runoff are recognized:

Ponded.—Little of the precipitation and run-on escapes as runoff, and free water stands on the surface for significant periods. The amount of water that must be removed from ponded areas by movement through the soils, by plants, or by evaporation is usually greater than the total rainfall. Ponding normally occurs in level or nearly level depressional areas, and the water depth may fluctuate greatly.

Very slow.—Surface water flows away slowly, and free water stands on the surface for long periods or immediately enters the soils. Most of the water
passes through the soils, is used by plants, or evaporates. The soils commonly are level or nearly level or are very open and porous.

**Slow.**—Surface water flows away slowly enough that free water stands on the surface for moderate periods or enters the soils rapidly. Most of the water passes through the soils, is used by plants, or evaporates. The soils commonly are nearly level or very gently sloping, or they are steeper but absorb precipitation very rapidly.

**Medium.**—Surface water flows away quickly enough that free water stands on the surface for only short periods. Part of the precipitation enters the soils and is used by plants, is lost through evaporation, or moves into underground channels. The soils commonly are nearly level or gently sloping and absorb precipitation at a moderate rate, or they are steeper but absorb water rapidly.

**Rapid.**—Surface water flows away quickly enough that the period of concentration is brief and free water does not stand on the surface. Only a small part of the water enters the soils. The soils generally are moderately steep or steep, and they absorb precipitation at a moderate or slow rate.

**Very rapid.**—Surface water flows away so quickly that the period of concentration is very brief and free water does not stand on the surface. Only a small part of the water enters the soils. The soils generally are steep or very steep, and they absorb precipitation slowly.

**Run-on.** Soil moisture received as runoff from adjacent areas.

**Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium. The conductivity of extract, in millimhos per centimeter, is expressed as:

- Nonsaline ................. 0 to 4
- Slightly saline ............. 4 to 8
- Moderately saline .......... 8 to 16
- Strongly saline .......... more than 16

**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.

**Sand dune.** A component landform made up of eolian, sand-sized mineral particles. Dunes commonly are on the leeward side of a Pleistocene lakebed.

**Sand sheet.** A major landform comprising an extensive layer of eolian sand from pluvial lake beaches, sometimes partly redeposited by water. The layer of sand is several feet thick. It is spread across alluvial flats, onto piedmont slopes, or over low mountains and has an undulating and commonly duned surface.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Sapric soil material (muck).** The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

**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.

**Semibolson.** An externally drained intermontane basin.

**Semibolson floor.** See Basin floor.

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Shoulder.** The convex slope component at the top of an erosional side slope.

**Side slope.** The erosional slope around the sides of an erosional fan remnant, hill, ballena, mountain, or other landform. It consists of shoulders, back slopes, foot slopes, and toe slopes. Also, the planimetrically linear parts of the slopes around a digitately dissected fan remnant, hill, or other landform, as compared with the planimetrically convex nose slopes and concave head slopes.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Site index.** A designation of the quality of a forest site. For pinyon pine and juniper stands, it is based on tree diameter at a height of 1 foot and the spacing between trees.

**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. In this survey the following slope classes are recognized:

<table>
<thead>
<tr>
<th>Slope Class</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearly level</td>
<td>0 to 2 percent</td>
</tr>
<tr>
<td>Gently sloping</td>
<td>2 to 4 percent</td>
</tr>
<tr>
<td>Moderately sloping</td>
<td>4 to 8 percent</td>
</tr>
<tr>
<td>Strongly sloping</td>
<td>8 to 15 percent</td>
</tr>
<tr>
<td>Moderately steep</td>
<td>15 to 30 percent</td>
</tr>
<tr>
<td>Steep</td>
<td>30 to 50 percent</td>
</tr>
<tr>
<td>Very steep</td>
<td>50 to 75 percent</td>
</tr>
<tr>
<td>Extremely steep</td>
<td>more than 75 percent</td>
</tr>
</tbody>
</table>

**Slope component.** A morphological element of an erosional slope and a morphological subdivision of the side slope landform element.

**Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na⁺ to Ca²⁺ + Mg²⁺. The degrees of sodicity and their respective ratios are:

- Nonsodic: less than 13:1
- Slightly sodic: 13-23:1
- Moderately sodic: 24-46:1
- Strongly sodic: more than 46:1

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil 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:

<table>
<thead>
<tr>
<th>Size Class</th>
<th>Size Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very coarse sand</td>
<td>2.0 to 1.0</td>
</tr>
<tr>
<td>Coarse sand</td>
<td>1.0 to 0.5</td>
</tr>
<tr>
<td>Medium sand</td>
<td>0.5 to 0.25</td>
</tr>
<tr>
<td>Fine sand</td>
<td>0.25 to 0.10</td>
</tr>
<tr>
<td>Very fine sand</td>
<td>0.10 to 0.05</td>
</tr>
<tr>
<td>Silt</td>
<td>0.05 to 0.002</td>
</tr>
<tr>
<td>Clay</td>
<td>less than 0.002</td>
</tr>
</tbody>
</table>

**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 underlying material. The living roots and plant and animal activities are largely confined to the solum.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Stony soil material.** Material, commonly in a subsurface layer, that contains a specified amount of rock fragments that are mainly 10 to 24 inches in diameter. Terms for the amount of these fragments, by percentage of the total volume, are:

- Stony: 15 to 35 percent
- Very stony: 35 to 60 percent
- Extremely stony: more than 60 percent

**Stream terrace.** A transversely level erosional remnant of a former axial stream or major desert stream flood plain that slopes in the same direction as the adjacent incised stream and is underlain by well-sorted, stratified sand and gravel or by loamy or clayey sediment.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—**platy** (laminated), **prismatic** (vertical axis of aggregates longer than horizontal), **columnar** (prisms with rounded tops), **blocky** (angular or subangular), and **granular.** Structureless soils are either **single grain** (each grain by itself, as in dune sand) or **massive** (the particles adhering without any regular cleavage, as in many hardpans).

**Summit.** The flattish top of an erosional fan remnant, hill, mountain, or other landform. The term is used for both a landform element and a slope component.

**Tailwater.** In hydraulics, the water directly downstream from a dam or similar structure.

**Talus.** Rock fragments of any size or shape, commonly coarse and angular, derived from and lying at the base of a cliff or very steep, rock slope. The accumulated mass of such loose, broken rock formed chiefly by falling, rolling, or sliding.

**Taxaadjuncts.** 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 taxaadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

**Terrace.** Any part of a general slope that stands above a short, steep scarp and has a nearly level or gently sloping summit. It may have another short scarp above the summit. Synonym: bench.
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.”

Toe slope. The lowest part of a foot slope component of an erosional slope. It is distinguished from the upper part of a foot slope by a greater accumulation of pedosediment. Also, the lowest and most gently sloping part of a slope.

Tufa. A chemical sedimentary rock composed of calcium carbonate or silica. It is deposited from solution in the water of a spring or lake.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Valley. An elongated depressional area cut by stream erosion and the associated water erosion of its side slopes (stream valley). The term also is used to describe an intermontane basin.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water-supplying capacity. Refers to the amount of water available in the soil for plant growth in a normal year from the total of precipitation, run-on, and a capillary fringe minus runoff.

Water table. The upper level of ground water or that level below which the soil is saturated.

Water table, perched. The water table of a saturated layer that is separated from an underlying saturated layer by an unsaturated layer.

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.
Appendix
Criteria Used in Rating Soils for Selected Uses

Daily Cover for Landfill

<table>
<thead>
<tr>
<th>Property</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Fair</td>
</tr>
<tr>
<td><strong>Property</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. USDA texture</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2. Depth to bedrock (inches)</td>
<td>&gt;60</td>
<td>40-60</td>
</tr>
<tr>
<td>3. Depth to cemented pan (inches)</td>
<td>&gt;60</td>
<td>40-60</td>
</tr>
<tr>
<td>5. USDA texture</td>
<td>---</td>
<td>CL, SICL, SC</td>
</tr>
<tr>
<td>6. USDA texture</td>
<td>---</td>
<td>LCOS, LS, LFS, VFS</td>
</tr>
<tr>
<td>7. Unified</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>8. Coarse fragments (percent)</td>
<td>&lt;25</td>
<td>25-50</td>
</tr>
<tr>
<td>9. Fraction greater than 3 inches</td>
<td>&lt;25</td>
<td>25-50</td>
</tr>
<tr>
<td>10. Slope (percent)</td>
<td>&lt;8</td>
<td>8-15</td>
</tr>
<tr>
<td>11. Depth to high water table (feet)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>12. Unified</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>13. Layer thickness (inches)</td>
<td>&gt;60</td>
<td>40-60</td>
</tr>
<tr>
<td>14. Soil reaction (pH)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>15. Salinity in the upper 60 inches (mmhos/cm)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>16. Sodium adsorption ratio (great group)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>17. Carbonates</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

1 Thickest layer between 10 and 60 inches.
2 If in kaolinitic family, rate one class better if experience confirms.
3 Disregard in all Aridisols except Salorthids and Aquic subgroups and all Torri great groups of Entisols except Aquic subgroups.
4 Sum (100 minus percent passing No. 10 sieve) and fraction greater than 3 inches. Use dominant condition for restrictive feature.
5 If the amount of carbonate is so high that it restricts the growth of plants, rate “Poor—excess lime.”
## Range Seeding

<table>
<thead>
<tr>
<th>Property</th>
<th>Good</th>
<th>Limits</th>
<th>Poor</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Moisture regime</td>
<td>Aquic, xeric, ustic, and xeric and ustic bordering on aridic or torric.</td>
<td>Aridic and torric bordering on aquic, xeric, or ustic.</td>
<td>Aridic and torric.</td>
<td>Too arid.</td>
</tr>
<tr>
<td>2. Effective moisture</td>
<td>&gt;10 in. (25 cm)</td>
<td>7-10 in. (17.5-25 cm)</td>
<td>&lt;7 in. (17.5 cm)</td>
<td>Too arid.</td>
</tr>
<tr>
<td>3. Available water capacity</td>
<td>Surface 10 in. (27 cm) &gt;1.25 in. (3.2 cm). Soil profile &gt; 4 in. (10.2 cm).</td>
<td>Surface 10 in. (25 cm) 0.75-1.25 in. (1.9-3.2 cm). Soil profile 2.5-4 in. (6.4-10.2 cm).</td>
<td>Surface 10 in. (25 cm) &lt;0.75 in. (1.9 cm). Soil profile &lt; 2.5 in. (6.4 cm).</td>
<td>Droughty.</td>
</tr>
<tr>
<td>4. Texture surface 7 in. (17.5 cm)</td>
<td>LVFS, COSL, SL, FSL, VDSL, L SIL, SCL, and CL SICL with &lt;35% C.</td>
<td>VFS, LFS, SC, SIC, C, and CL and SICL with &gt;35% C.</td>
<td>LS, LCOS, FS, COS.</td>
<td>Too sandy, Too clayey.</td>
</tr>
<tr>
<td>5. Rock fragments in surface 7 in. (17.5 cm)</td>
<td>GR &lt;35%; CB &lt;15%; ST &lt;3%. Total rock fragments &lt;35%.</td>
<td>GR &lt;35%; CB 15-35%; ST 3-15%. Total rock fragments &lt;35%.</td>
<td>GR &gt;35%; CB &gt;35%; ST &gt;15%. Total rock fragments &gt;35%.</td>
<td>Small stones, Large stones.</td>
</tr>
<tr>
<td>7. Depth to bedrock or hardpan</td>
<td>&gt;20 in. (50 cm)</td>
<td></td>
<td>&lt;10 in. (25 cm)</td>
<td>Depth to rock/pan.</td>
</tr>
<tr>
<td>8. Electrical conductivity-saturation extract 25 °C</td>
<td>&lt;2 mmhos/cm (0.2 s/m) in upper 20 in. (50 cm).</td>
<td>2.4 mmhos/cm (0.2-0.4 s/m) in upper 10 in. (25 cm) and 4-8 mmhos/cm (0.4-0.8 s/m) in 10-20 in. (25-50 cm).</td>
<td>&gt;4 mmhos/cm (0.4 s/m) in upper 10 in. (25 cm) and/or &gt;8 mmhos/cm (0.8 s/m) in 10-20 in. (25-50 cm).</td>
<td>Excess salt.</td>
</tr>
<tr>
<td>9. Sodium adsorption ratio</td>
<td>&lt;8 in upper 20 in. (50 cm).</td>
<td>8-13 in upper 10 in. (25 cm) and &lt;20 in 10-20 in. (25-50 cm).</td>
<td>&gt;13 in upper 10 in. (25 cm) and/or &gt;20 in 10-20 in. (25-50 cm).</td>
<td>Excess sodium.</td>
</tr>
<tr>
<td>10. K x percent slope</td>
<td>&lt;4; &lt;6</td>
<td>4-6; 6-8</td>
<td>&gt;6; &gt;8</td>
<td>Erodes easily.</td>
</tr>
<tr>
<td>11. I x C</td>
<td>&lt;60</td>
<td></td>
<td>&gt;60</td>
<td>Soil blowing.</td>
</tr>
<tr>
<td>12. Soil surface morphological types</td>
<td>Types I and II &gt;60%; type IV &lt;5%; or with mollic epipedon</td>
<td>Types I and II 20-60%; type IV &lt;10%</td>
<td>Type III &lt;60%; type IV &gt;10%</td>
<td>Too crusty.</td>
</tr>
</tbody>
</table>

1 Moisture from precipitation, run-on, and ground water budgeted to actual evapotranspiration.
2 Rate Vertisols and Vertic subgroups as poor.
3 Sheet and rill erosion hazard (bare soil).
4 For ustic bordering on aridic or torric and for aridic or torric bordering on ustic moisture regimes.
5 For xeric, xeric bordering on aridic or torric, and aridic or torric bordering on xeric moisture regimes.
6 Wind erosion hazard (bare soil).
8 Soils without crusting morphology are to be included in types I and II for rating.
# Shallow Excavations

<table>
<thead>
<tr>
<th>Property</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slight</td>
<td>Moderate</td>
</tr>
<tr>
<td>1. USDA texture</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2. Depth to bedrock (inches):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard</td>
<td>&gt;60</td>
<td>40-60</td>
</tr>
<tr>
<td>Soft</td>
<td>&gt;40</td>
<td>20-40</td>
</tr>
<tr>
<td>3. Depth to cemented pan (inches):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thick</td>
<td>&gt;60</td>
<td>40-60</td>
</tr>
<tr>
<td>Thin</td>
<td>&gt;40</td>
<td>20-40</td>
</tr>
<tr>
<td>4. USDA texture (20 to 60 inches)</td>
<td>---</td>
<td>SI ¹</td>
</tr>
<tr>
<td>5. USDA texture (20 to 60 inches)</td>
<td>---</td>
<td>C, SIC</td>
</tr>
<tr>
<td>7. Bulk density (g/cc)</td>
<td>---</td>
<td>&gt;1.8</td>
</tr>
<tr>
<td>8. Unified (20 to 60 inches)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>9. Fraction greater than 3 inches (percent by weight) ²</td>
<td>&lt;25</td>
<td>25-50</td>
</tr>
<tr>
<td>10. Depth to high water table (feet)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>12. Slope (percent)</td>
<td>0-8</td>
<td>8-15</td>
</tr>
</tbody>
</table>

¹ In areas of loess, rating should be slight.
² Weighted average to 40 inches.
### Local Roads and Streets

<table>
<thead>
<tr>
<th>Property</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slight</td>
<td>Moderate</td>
</tr>
<tr>
<td>1. USDA texture</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2. Total subsidence</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3. Depth to bedrock (inches):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard</td>
<td>&gt;40</td>
<td>20-40</td>
</tr>
<tr>
<td>Soft</td>
<td>&gt;20</td>
<td>&lt;20</td>
</tr>
<tr>
<td>4. Depth to cemented pan (inches):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thick</td>
<td>&gt;40</td>
<td>20-40</td>
</tr>
<tr>
<td>Thin</td>
<td>&gt;20</td>
<td>&lt;20</td>
</tr>
<tr>
<td>5. Shrink-swell potential</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>6. AASHTO group index number</td>
<td>0-4</td>
<td>5-8</td>
</tr>
<tr>
<td>7. Depth to high water table (feet)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>8. Slope (percent)</td>
<td>&lt;8</td>
<td>8-15</td>
</tr>
<tr>
<td>9. Flooding</td>
<td>None</td>
<td>Rare</td>
</tr>
<tr>
<td>10. Potential frost action</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>11. Fraction greater than 3 inches (percent by weight)</td>
<td>&lt;25</td>
<td>25-50</td>
</tr>
</tbody>
</table>

---

1. Thickest layer between 10 and 40 inches.
2. GIN = (F-35)(.2 + .005(LL-40)) + .01 (F-15)(PI-10) where F = percent passing No. 200 sieve. If F is <35 and PI is >11, use only part 2 of equation. Use median values.
3. If in kaolinitic family, rate one class better if experience confirms.
4. Weighted average to 40 inches.
5. If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate "Severe—slippage."
6. If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, rate "Severe—pitting."
7. If the soil is susceptible to differential settling, rate "Severe—unstable fill."
# Roadfill

<table>
<thead>
<tr>
<th>Property</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Fair</td>
</tr>
<tr>
<td>1. USDA texture</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2. Depth to bedrock (inches)</td>
<td>&gt;60</td>
<td>40-60</td>
</tr>
<tr>
<td>3. Depth to cemented pan (thick) (inches)</td>
<td>&gt;60</td>
<td>40-60</td>
</tr>
<tr>
<td>4. Shrink-swell potential</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>5. AASHTO group index number</td>
<td>0-4</td>
<td>5-8</td>
</tr>
<tr>
<td>6. Layer thickness (inches)</td>
<td>&gt;60</td>
<td>30-60</td>
</tr>
<tr>
<td>7. Fraction greater than 3 inches (percent by weight)</td>
<td>&lt;25</td>
<td>25-50</td>
</tr>
<tr>
<td>8. Depth to high water table (feet)</td>
<td>&gt;3</td>
<td>1-3</td>
</tr>
</tbody>
</table>

1. If the content of gypsum is 10 to 15 percent, rate “Fair—excess gypsum.” If it exceeds 15 percent, rate “Poor—excess gypsum.”

2. Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.

3. GIN = [(F=35);(.2 + .005(LL-40)) + .01 (F=15)(PI-10)] where F = percent passing No. 200 sieve. If F is <35 and PI is >11, use only part 2 of equation. Use median values.

4. If in kaolinitic family, rate one class better if experience confirms.

5. Weighted average to 40 inches.
### Sand

<table>
<thead>
<tr>
<th>Property</th>
<th>Probable source</th>
<th>Improbable source</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. USDA texture</td>
<td>---</td>
<td>Ice</td>
<td>Permafrost.</td>
</tr>
<tr>
<td>2. Unified(^1)</td>
<td>SW, SP, SW-SM, SP-SM, GW, GP, GW-GM, GP-GM(^2)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>GW, GP, GW-GM, GP-GM(^3)</td>
<td>Small stones.</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>PT</td>
<td>Excess humus.</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>All other</td>
<td>Excess fines.</td>
</tr>
<tr>
<td>3. Layer thickness (inches)</td>
<td>---</td>
<td>&lt;36</td>
<td>Thin layer.</td>
</tr>
<tr>
<td></td>
<td>&gt;36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Fraction greater than 3 inches (percent by</td>
<td>---</td>
<td>&gt;50</td>
<td>Large stones.</td>
</tr>
<tr>
<td>weight)(^4)</td>
<td>&lt;50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.

\(^2\) Percent passing No. 4 sieve minus percent passing No. 200 sieve is greater than 25.

\(^3\) Percent passing No. 4 sieve minus percent passing No. 200 sieve is less than 25.

\(^4\) Thickest layer between 10 and 60 inches.
## Gravel

<table>
<thead>
<tr>
<th>Property</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probable source</td>
<td>Improbable source</td>
</tr>
<tr>
<td>1. USDA texture</td>
<td>...</td>
<td>Ice</td>
</tr>
<tr>
<td>2. Unified 1</td>
<td>GW, GP, GW-GM, GP-GM</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>SW, SP, SW-SM, SP-SM 2</td>
<td>PT</td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>All other</td>
</tr>
<tr>
<td>3. Layer thickness (inches)</td>
<td>...</td>
<td>&lt;36</td>
</tr>
<tr>
<td></td>
<td>&gt;36</td>
<td>...</td>
</tr>
<tr>
<td>4. Fraction greater than 3 inches (percent by weight) 4</td>
<td>...</td>
<td>&gt;50</td>
</tr>
<tr>
<td></td>
<td>&lt;50</td>
<td>...</td>
</tr>
</tbody>
</table>

1 Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.
2 100 minus percent passing No. 4 sieve is greater than 25.
3 100 minus percent passing No. 4 sieve is less than 25.
4 Thickest layer between 10 and 60 inches.
## Topsoil

<table>
<thead>
<tr>
<th>Property</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Fair</td>
</tr>
<tr>
<td>1. USDA texture</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2. Depth to bedrock (inches)</td>
<td>&gt;40</td>
<td>20-40</td>
</tr>
<tr>
<td>3. Depth to cemented pan (inches)</td>
<td>&gt;40</td>
<td>20-40</td>
</tr>
<tr>
<td>4. Depth to bulk density greater than 1.8 g/cc (inches)</td>
<td>&gt;40</td>
<td>20-40</td>
</tr>
<tr>
<td>5. USDA texture</td>
<td>---</td>
<td>LCOS, LS, LFS, LVFS</td>
</tr>
<tr>
<td>6. USDA texture (^1)</td>
<td>---</td>
<td>SCL, CL, SICL (^2)</td>
</tr>
<tr>
<td>7. USDA texture (^1)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>8. Fraction greater than 3 inches (percent by weight): (^3)</td>
<td>(&lt;5)</td>
<td>5-25</td>
</tr>
<tr>
<td>9. Coarse fragments (percent): (^3)</td>
<td>&lt;15</td>
<td>15-30</td>
</tr>
<tr>
<td>10. Salinity (mmhos/cm) (^4)</td>
<td>&lt;4</td>
<td>4-8</td>
</tr>
<tr>
<td>11. Layer thickness (inches)</td>
<td>&gt;40</td>
<td>20-40</td>
</tr>
<tr>
<td>12. Depth to high water table (feet)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>13. Sodium adsorption ratio in the upper 40 inches (great group or phase)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>14. Soil reaction (pH) (^1)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>15. Slope (percent)</td>
<td>&lt;8</td>
<td>8-15</td>
</tr>
<tr>
<td>16. Carbonates</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

---

1. Thickest layer between 0 and 40 inches.

2. If soil contains more than 3 percent organic matter and has less than 35 percent clay, rate good.

3. Sum (100 minus percent passing No. 10 sieve) and fraction greater than 3 inches. Use dominant condition for restrictive feature.

4. If the amount of carbonate is so high that it restricts the growth of plants, rate "Poor—excess lime."
## Pond Reservoir Areas

<table>
<thead>
<tr>
<th>Property</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slight</td>
<td>Moderate</td>
</tr>
<tr>
<td>1. USDA texture</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2. Permeability between 20 and 60 inches (inches/hour)</td>
<td>&lt;0.6</td>
<td>0.6-2.0</td>
</tr>
<tr>
<td>3. Depth to bedrock (inches)</td>
<td>&gt;60</td>
<td>20-60</td>
</tr>
<tr>
<td>4. Depth to cemented pan (inches)</td>
<td>&gt;60</td>
<td>20-60</td>
</tr>
<tr>
<td>5. Slope (percent)</td>
<td>&lt;3</td>
<td>3-8</td>
</tr>
<tr>
<td>6. USDA texture (all depths)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>7. Downslope movement</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>8. Formation of pits</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

1. If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate “Severe—slippage.”

2. If the soil is susceptible to the formation of pits caused by the melting of ground ice when the surface cover is removed, rate “Severe—pitting.”
# Embankments, Dikes, and Levees

<table>
<thead>
<tr>
<th>Property ¹</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slight</td>
<td>Moderate</td>
</tr>
<tr>
<td>1. USDA texture</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2. Layer thickness (inches)</td>
<td>&gt;60</td>
<td>30-60</td>
</tr>
<tr>
<td>5. Unified ²</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>7. Fraction greater than 3 inches (percent by weight) ⁹</td>
<td>&lt;15</td>
<td>15-35</td>
</tr>
<tr>
<td>8. Depth to high water table (feet)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Apparent</td>
<td>&gt;4</td>
<td>2-4</td>
</tr>
<tr>
<td>Perched</td>
<td>&gt;3</td>
<td>1-3</td>
</tr>
<tr>
<td>9. Sodium adsorption ratio in the upper 40 inches (great group or phase)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>10. Salinity (mmhos/cm) (any depth)</td>
<td>&lt;8</td>
<td>8-16</td>
</tr>
</tbody>
</table>

¹ If the content of gypsum is 5 to 10 percent, rate "Moderate—excess gypsum." If it exceeds 10 percent, rate "Severe—excess gypsum."

² Thickest layer between 10 and 60 inches.

³ Rate moderate if more than 20 percent passing No. 200 sieve and slight if more than 30 percent passing No. 200 sieve.

⁴ Rate slight if less than 35 percent passing No. 200 sieve, less than 50 percent passing No. 40 sieve, and less than 65 percent passing No. 10 sieve. The soil must meet all three criteria before it is rated slight.

⁵ Rate slight if PI is greater than 15.

⁶ Rate moderate if PI is greater than 10.

⁷ Rate moderate if less than 70 percent passing No. 40 sieve and less than 90 percent passing No. 10 sieve, and rate slight if less than 60 percent passing No. 40 sieve and less than 75 percent passing No. 10 sieve.

⁸ Rate moderate if PI is less than 40.

⁹ Weighted average to 40 inches.
## Drainage

<table>
<thead>
<tr>
<th>Property</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. USDA texture</td>
<td>Ice</td>
<td>Permafrost.</td>
</tr>
<tr>
<td>2. Depth to high water table (feet) (^1)</td>
<td>&gt;3 (^2)</td>
<td>Deep to water.</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>Ponding.</td>
</tr>
<tr>
<td>3. Permeability in the upper 40 inches (inches/hour)</td>
<td>&lt;0.2</td>
<td>Percs slowly.</td>
</tr>
<tr>
<td>4. Depth to bedrock (inches)</td>
<td>&lt;40</td>
<td>Depth to rock.</td>
</tr>
<tr>
<td>5. Depth to cemented pan (inches)</td>
<td>&lt;40</td>
<td>Cemented pan.</td>
</tr>
<tr>
<td>6. Flooding</td>
<td>Common</td>
<td>Flooding.</td>
</tr>
<tr>
<td>7. Total subsidence</td>
<td>Any entry</td>
<td>Subsides.</td>
</tr>
<tr>
<td>8. Fraction greater than 3 inches (percent by weight) (^3)</td>
<td>&gt;25</td>
<td>Large stones.</td>
</tr>
<tr>
<td>10. Slope (percent)</td>
<td>&gt;3</td>
<td>Slope.</td>
</tr>
<tr>
<td>11. USDA texture (^3)</td>
<td>COS, S, FS, VFS, LCOS, LS, LFS, LVFS, SG, G</td>
<td>Cutbanks cave.</td>
</tr>
<tr>
<td>12. Salinity (mmhos/cm) (any depth)</td>
<td>&gt;8</td>
<td>Excess salt.</td>
</tr>
<tr>
<td>13. Sodium adsorption ratio in the upper 40 inches (great group or phase)</td>
<td>&gt;12 (natric, halic, alkali phases)</td>
<td>Excess sodium.</td>
</tr>
<tr>
<td>15. Soil reaction (pH) (any depth)</td>
<td>&lt;3.6</td>
<td>Too acid.</td>
</tr>
<tr>
<td>17. Complex landscape</td>
<td>((5))</td>
<td>Complex slope.</td>
</tr>
<tr>
<td>18. Availability of outlets</td>
<td>((6))</td>
<td>Poor outlets.</td>
</tr>
</tbody>
</table>

\(^1\) If "Deep to water," disregard other properties.
\(^2\) If irrigated, consider other restrictive features if the water table is between 3 and 5 feet.
\(^3\) Thickest layer between 10 and 60 inches.
\(^4\) If the soil is susceptible to movement downslope when loaded, excavated, or wet, list "Slippage" as a restrictive feature.
\(^5\) If complex and irregular slopes cause difficulty in design, installation, or functioning of the system, list "Complex slope" as a restrictive feature.
\(^6\) If good outlets are difficult to find, list "Poor outlets" as a restrictive feature.
### Irrigation

<table>
<thead>
<tr>
<th>Property</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. USDA texture</td>
<td>Ice</td>
<td>Permafrost.</td>
</tr>
<tr>
<td>2. Slope (percent)</td>
<td>&gt;3</td>
<td>Slope.</td>
</tr>
<tr>
<td>3. Fraction greater than 3 inches (percent by weight) ¹</td>
<td>&gt;25</td>
<td>Large stones.</td>
</tr>
<tr>
<td>4. Depth to high water table (feet)</td>
<td>+</td>
<td>Ponding.</td>
</tr>
<tr>
<td></td>
<td>&lt;3 ²</td>
<td>Wetness.</td>
</tr>
<tr>
<td>5. Available water capacity (inches/inch)</td>
<td>&lt;0.10</td>
<td>Droughty.</td>
</tr>
<tr>
<td>6. USDA texture (surface layer)</td>
<td>COS, S, FS, VFS, LCOS, LS, LFS, LVFS</td>
<td>Fast intake.</td>
</tr>
<tr>
<td>7. USDA texture (surface layer)</td>
<td>SIC, C, SC</td>
<td>Slow intake.</td>
</tr>
<tr>
<td>8. Wind erodibility group</td>
<td>1, 2, 3</td>
<td>Soil blowing.</td>
</tr>
<tr>
<td>9. Permeability in the upper 60 inches (inches/hour)</td>
<td>&lt;0.2</td>
<td>Percs slowly.</td>
</tr>
<tr>
<td>10. Depth to bedrock (inches)</td>
<td>&lt;40</td>
<td>Depth to rock.</td>
</tr>
<tr>
<td>11. Depth to cemented pan (inches)</td>
<td>&lt;40</td>
<td>Cemented pan.</td>
</tr>
<tr>
<td>12. Fragi pan (great group)</td>
<td>All fragi</td>
<td>Rooting depth.</td>
</tr>
<tr>
<td>13. Bulk density in the upper 40 inches (g/cc)</td>
<td>&gt;1.7</td>
<td>Rooting depth.</td>
</tr>
<tr>
<td>14. Erosion factor K (surface layer)</td>
<td>&gt;.35</td>
<td>Erodes easily.</td>
</tr>
<tr>
<td>15. Flooding</td>
<td>Common</td>
<td>Flooding.</td>
</tr>
<tr>
<td>16. Sodium adsorption ratio in the upper 40 inches (great group or phase)</td>
<td>&gt;12 (natric, halic, alkali phases)</td>
<td>Excess sodium.</td>
</tr>
<tr>
<td>17. Salinity in the upper 40 inches (mmhos/cm)</td>
<td>&gt;4</td>
<td>Excess salt.</td>
</tr>
<tr>
<td>18. Soil reaction (pH) (any depth)</td>
<td>&lt;3.6</td>
<td>Too acid.</td>
</tr>
<tr>
<td>19. Complex landscape</td>
<td>(³)</td>
<td>Complex slope.</td>
</tr>
</tbody>
</table>

¹ Weighted average to 40 inches.
² Disregard if depth to water table is below 3 feet during growing season.
³ If complex and irregular slopes cause difficulty in design, installation, or functioning of the system, list “Complex slope” as a restrictive feature.
⁴ If the soil is susceptible to the formation of pits caused by the melting of ground ice when ground cover is removed, list “Pitting” as a restrictive feature.
⁵ If the amount of carbonate is so high that it restricts the growth of plants, list “Excess lime” as a restrictive feature.
### Terraces and Diversions

<table>
<thead>
<tr>
<th>Property ¹</th>
<th>Limits</th>
<th>Restrictive feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>USDA texture</td>
<td>Ice</td>
<td>Permafrost.</td>
</tr>
<tr>
<td>Slope (percent)</td>
<td>&gt;8</td>
<td>Slope.</td>
</tr>
<tr>
<td>Fraction greater than 3 inches (percent by weight) ²</td>
<td>&gt;15</td>
<td>Large stones.</td>
</tr>
<tr>
<td>Depth to bedrock (inches)</td>
<td>&lt;40</td>
<td>Depth to rock.</td>
</tr>
<tr>
<td>Depth to cemented pan (inches)</td>
<td>&lt;40</td>
<td>Cemented pan.</td>
</tr>
<tr>
<td>Erosion factor K (upper 40 inches)</td>
<td>&gt;.35</td>
<td>Erodas easily.</td>
</tr>
<tr>
<td>Depth to high water table (feet)</td>
<td>+</td>
<td>Ponding.</td>
</tr>
<tr>
<td></td>
<td>&lt;3.0</td>
<td>Wetness.</td>
</tr>
<tr>
<td>Fragipan (great group)</td>
<td>All fragi</td>
<td>Rooting depth.</td>
</tr>
<tr>
<td>USDA texture ³</td>
<td>COS, S, FS, LS, LCOS, SG</td>
<td>Too sandy.</td>
</tr>
<tr>
<td>Wind erodibility group</td>
<td>1, 2, 3</td>
<td>Soil blowing.</td>
</tr>
<tr>
<td>Permeability (inches/hour) ³</td>
<td>&lt;0.2</td>
<td>Percs slowly.</td>
</tr>
<tr>
<td>Downslope movement</td>
<td>(⁴)</td>
<td>Slippage.</td>
</tr>
<tr>
<td>Complex landscape</td>
<td>(⁵)</td>
<td>Complex slope.</td>
</tr>
<tr>
<td>Availability of outlets</td>
<td>(⁶)</td>
<td>Poor outlets.</td>
</tr>
</tbody>
</table>

¹ If the content of gypsum exceeds 5 percent, list “Excess gypsum” as a restrictive feature.
² Weighted average to 40 inches.
³ Thickest layer between 10 and 60 inches.
⁴ If the soil is susceptible to movement downslope when loaded, excavated, or wet, list “Slippage” as a restrictive feature.
⁵ If complex and irregular slopes cause difficulty in design, installation, or functioning of the system, list “Complex slope” as a restrictive feature.
⁶ If good outlets are difficult to find, list “Poor outlets” as a restrictive feature.
**Guide for Estimating the Hazard of Erosion on Bare Soil in Nevada**

(“K” means erosion factor K; “S” means percent slope; “I” means wind erodibility index; “C” means climatic factor)

<table>
<thead>
<tr>
<th></th>
<th>Water (K x S)</th>
<th>Wind (I x C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slight</td>
<td>&lt;4</td>
<td>&lt;60</td>
</tr>
<tr>
<td>Moderate</td>
<td>4-8</td>
<td>60-100</td>
</tr>
<tr>
<td>High</td>
<td>&gt;8</td>
<td>&gt;100</td>
</tr>
</tbody>
</table>
Tables
TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-80 at Lovelock, Nevada)

<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average daily</td>
<td>Average daily</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>Minimum</td>
</tr>
<tr>
<td></td>
<td>°F</td>
<td>°F</td>
</tr>
<tr>
<td>January-----</td>
<td>44.6</td>
<td>19.8</td>
</tr>
<tr>
<td>February-----</td>
<td>51.8</td>
<td>24.4</td>
</tr>
<tr>
<td>March--------</td>
<td>57.4</td>
<td>27.9</td>
</tr>
<tr>
<td>April--------</td>
<td>66.0</td>
<td>34.4</td>
</tr>
<tr>
<td>May----------</td>
<td>75.1</td>
<td>43.3</td>
</tr>
<tr>
<td>June---------</td>
<td>83.9</td>
<td>50.2</td>
</tr>
<tr>
<td>July---------</td>
<td>93.8</td>
<td>57.0</td>
</tr>
<tr>
<td>August-------</td>
<td>91.5</td>
<td>53.4</td>
</tr>
<tr>
<td>September----</td>
<td>83.6</td>
<td>45.6</td>
</tr>
<tr>
<td>October------</td>
<td>71.6</td>
<td>36.0</td>
</tr>
<tr>
<td>November-----</td>
<td>55.7</td>
<td>26.4</td>
</tr>
<tr>
<td>December-----</td>
<td>46.3</td>
<td>20.5</td>
</tr>
<tr>
<td>Yearly:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average------</td>
<td>68.4</td>
<td>36.6</td>
</tr>
</tbody>
</table>

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).
### TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-80 at Lovelock, Nevada)

<table>
<thead>
<tr>
<th>Probability</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24 °F</td>
</tr>
<tr>
<td></td>
<td>or lower</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Last freezing temperature in spring:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year in 10 later than--</td>
</tr>
<tr>
<td>May 3</td>
</tr>
<tr>
<td>May 11</td>
</tr>
<tr>
<td>May 25</td>
</tr>
<tr>
<td>2 years in 10 later than--</td>
</tr>
<tr>
<td>Apr. 26</td>
</tr>
<tr>
<td>May 6</td>
</tr>
<tr>
<td>May 20</td>
</tr>
<tr>
<td>5 years in 10 later than--</td>
</tr>
<tr>
<td>Apr. 13</td>
</tr>
<tr>
<td>Apr. 27</td>
</tr>
<tr>
<td>May 9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First freezing temperature in fall:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year in 10 earlier than--</td>
</tr>
<tr>
<td>Oct. 14</td>
</tr>
<tr>
<td>Sept. 28</td>
</tr>
<tr>
<td>Sept. 19</td>
</tr>
<tr>
<td>2 years in 10 earlier than--</td>
</tr>
<tr>
<td>Oct. 19</td>
</tr>
<tr>
<td>Oct. 4</td>
</tr>
<tr>
<td>Sept. 25</td>
</tr>
<tr>
<td>5 years in 10 earlier than--</td>
</tr>
<tr>
<td>Oct. 28</td>
</tr>
<tr>
<td>Oct. 15</td>
</tr>
<tr>
<td>Oct. 5</td>
</tr>
</tbody>
</table>

### TABLE 3.--GROWING SEASON

(Recorded in the period 1951-80 at Lovelock, Nevada)

<table>
<thead>
<tr>
<th>Probability</th>
<th>Daily minimum temperature during growing season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Higher than 24 °F</td>
</tr>
<tr>
<td></td>
<td>Days</td>
</tr>
<tr>
<td>9 years in 10</td>
<td>172</td>
</tr>
<tr>
<td>8 years in 10</td>
<td>181</td>
</tr>
<tr>
<td>5 years in 10</td>
<td>197</td>
</tr>
<tr>
<td>2 years in 10</td>
<td>214</td>
</tr>
<tr>
<td>1 year in 10</td>
<td>222</td>
</tr>
<tr>
<td>Map</td>
<td>Soil name</td>
</tr>
<tr>
<td>-----</td>
<td>-----------</td>
</tr>
<tr>
<td>001</td>
<td>Plays-----</td>
</tr>
<tr>
<td>002</td>
<td>Badland---</td>
</tr>
<tr>
<td>003</td>
<td>Slickens-</td>
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TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

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<td>Goldrun Variant sandy loam, 4 to 15 percent slopes</td>
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<td>Yobe Variant silty clay</td>
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<td>Millerlux-Ninemile-Madeline association</td>
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** Total------------------------- 1,965,973 | 100.0

* Less than 0.1 percent.
** Map unit boundaries were plotted and verified at closely spaced intervals.
### TABLE 5.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

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<th>Soil name and map symbol</th>
<th>Depth</th>
<th>USDA texture</th>
<th>Classification</th>
<th>Fragments</th>
<th>Percentage passing sieve number</th>
<th>Liquid limit</th>
<th>Plasticity index</th>
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<td>sieve number</td>
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| In | Pct | Pct |

113*:  

3-13 | Very fine sandy | ML | A-4 | 0-5 | 80-100 | 75-100 | 70-90 | 50-70 | --- | NP |

13-29 | Clay loam, clay | CL, CH | A-7 | 0 | 80-100 | 75-100 | 65-80 | 50-70 | 40-55 | 15-30 |

29-60 | Extremely | GP, GP-GM | A-1 | 0-10 | 15-35 | 10-25 | 5-20 | 0-10 | --- | NP |

132*:  
Jerval | 0-6 | Gravely very | SM | A-4 | 0-10 | 70-85 | 55-75 | 50-75 | 35-50 | --- | NP |

6-22 | Gravely clay | CL | A-6 | 0-5 | 65-85 | 60-75 | 55-75 | 50-65 | 35-40 | 15-20 |

22-60 | Very gravely | GM | A-1 | 0-10 | 45-60 | 35-50 | 25-45 | 15-25 | --- | NP |

Knoss | 0-7 | Cobbly very | ML, SM, GM | A-4 | 10-25 | 70-90 | 65-85 | 55-75 | 45-60 | 15-25 | NP-5 |

7-15 | Clay | CL, CH | A-7 | 0-5 | 80-100 | 75-100 | 70-95 | 70-95 | 45-65 | 20-35 |

15-52 | Indurated layer | --- | --- | --- | --- | --- | --- | --- | --- | --- |

52-60 | Extremely | GP-GM | A-1 | 5-15 | 30-50 | 10-25 | 5-20 | 5-10 | --- | NP |

Chilper | 0-3 | Cobbly very | ML, GM, SM | A-4 | 10-25 | 70-90 | 65-85 | 60-80 | 45-60 | --- | NP |

3-13 | Very fine sandy | ML | A-4 | 0-5 | 80-100 | 75-100 | 70-90 | 50-70 | --- | NP |

13-29 | Clay loam, clay | CL, CH | A-7 | 0 | 80-100 | 75-100 | 65-80 | 50-70 | 40-55 | 15-30 |

29-60 | Extremely | GP, GP-GM | A-1 | 0-10 | 15-35 | 10-25 | 5-20 | 0-10 | --- | NP |

133*:  
Jerval | 0-6 | Gravely very | SM | A-4 | 0-10 | 70-85 | 55-75 | 50-75 | 35-50 | --- | NP |

6-22 | Gravely clay | CL | A-6 | 0-5 | 65-85 | 60-75 | 55-75 | 50-65 | 35-40 | 15-20 |

22-60 | Very gravely | GM | A-1 | 0-10 | 45-60 | 35-50 | 25-45 | 15-25 | --- | NP |

See footnote at end of table.
TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

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<td>20-60</td>
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<td>A-1, A-2</td>
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<th>Fragments</th>
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### TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

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| Humboldt                | 0-6   | CL           | A-7            | 0         | 100 100 100 90-100 | 40-50 20-25 |
| 6-60                    | MH    | A-7          |                | 0         | 90-100 90-100 85-100 80-100 | 50-60 15-25 |

| Humboldt                | 0-13  | CL           | A-7            | 0         | 100 100 100 90-100 | 40-50 20-25 |
| 13-60                   | MH    | A-7          |                | 0         | 90-100 90-100 85-100 80-100 | 50-60 15-25 |

| McConnel                | 0-20  | ML           | A-4            | 0         | 95-100 85-95 70-80 50-60 | 15-25 NP-5  |
| 20-60                   | GP    | A-1          | 0-15           | 25-35 10-35 5-15 0-5 | --- NP    |

| McConnel                | 0-20  | GM           | A-2, A-4       | 0         | 60-70 50-70 40-60 25-45 | 15-25 NP-5  |
| 20-60                   | GP    | A-1          | 0-15           | 25-35 10-35 5-15 0-5 | --- NP    |

| Needle Peak             | 0-4   | CL, ML       | A-6, A-7       | 0         | 100 100 95-100 80-90 | 30-45 10-15 |
| 4-60                    | CL, ML | A-6, A-7    |                | 0         | 100 100 95-100 80-95 | 30-50 10-20 |

| Ninch                   | 0-6   | SM           | A-2            | 0         | 100 100 80-90 10-25 | --- NP    |
| 6-35                    | SM    | A-2          |                | 0         | 100 100 75-95 15-35 | --- NP    |

| Ninch                   | 35-41 | SM           | A-2            | 0         | 100 100 75-95 15-35 | --- NP    |
| 41-70                   | ML    | A-4          |                | 0         | 100 100 75-95 55-75 | --- NP    |

| Orovada                 | 0-6   | ML           | A-4            | 0         | 95-100 90-100 80-95 60-75 | 25-35 NP-5  |
| 6-15                    | SM, ML | A-4         |                | 0         | 90-100 75-95 60-80 40-60 | 20-30 NP-5  |
| 15-60                   | SM, ML | A-4         |                | 0         | 75-100 75-95 60-85 35-55 | 20-30 NP-5  |

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| 598*: | In | | | | | | | | | | |
| Ossorel Variant | 0-4 | Cobbley loam | ML | A-4 | 15-40 | 185-95 | 80-90 | 60-80 | 150-70 | 20-25 | NP-5 |
| | 4-12 | Clay, clay loam | CL, CH | A-7 | 0 | 85-95 | 80-90 | 65-90 | 60-85 | 40-55 | 20-30 |
| | 32-55 | Clay loam | CL | A-6 | 0 | 85-100 | 80-90 | 70-85 | 50-65 | 35-40 | 15-20 |
| | 55 | Unweathered | bedrock | --- | --- | --- | --- | --- | --- | --- | --- |
| Bojo---------- | 0-3 | Very cobbley loam | GM-GC | A-2, A-4 | 50-50 | 55-65 | 50-60 | 10-50 | 30-40 | 25-40 | 5-10 |
| | 3-10 | Gravelly loam | GC, CL | A-6 | 0-10 | 70-90 | 65-85 | 60-80 | 45-70 | 30-40 | 10-20 |
| | 10-14 | Unweathered | bedrock | --- | --- | --- | --- | --- | --- | --- | --- |
| 599*: | In | | | | | | | | | | |
| | 3-10 | Gravelly clay | CL, GC, CH | A-7 | 0-10 | 55-65 | 60-80 | 50-70 | 40-55 | 40-55 | 20-30 |
| | 30 | Unweathered | bedrock | --- | --- | --- | --- | --- | --- | --- | --- |
| Burrita------- | 0-8 | Very stony loam | GM-GC | A-4 | 25-40 | 60-70 | 55-65 | 50-60 | 35-45 | 15-25 | 5-10 |
| | 17-21 | Unweathered | bedrock | --- | --- | --- | --- | --- | --- | --- | --- |
| Rock outcrop. | | | | | | | | | | |
| 600---------- | 0-3 | Fine sandy loam | SM, ML | A-2, A-4 | 0-5 | 85-100 | 80-100 | 60-80 | 30-55 | 15-25 | NP-5 |
| Valmy-------- | 3-60 | Stratified very fine sandy loam | SM | A-4, A-2 | 0-5 | 80-95 | 75-90 | 40-70 | 20-45 | 15-25 | NP-5 |
| Weso--------- | 0-7 | Very fine sandy loam | SM, ML | A-4 | 0 | 95-100 | 90-100 | 75-90 | 40-55 | 15-25 | NP-5 |
| | 7-12 | Fine sandy loam | ML, CL-ML | A-4 | 0 | 95-100 | 85-95 | 70-85 | 45-60 | 15-30 | NP-10 |
| | 12-60 | Fine sandy loam | ML, SM | A-4 | 0 | 95-100 | 85-95 | 70-85 | 45-60 | 15-25 | NP-5 |
| 614---------- | 0-7 | Silt loam | CL-ML, ML | A-4 | 0 | 95-100 | 90-100 | 80-95 | 75-90 | 20-30 | NP-10 |
| Weso--------- | 7-60 | Sandy loam, fine sandy loam | SM, ML | A-4 | 0 | 80-100 | 75-95 | 65-80 | 40-60 | 15-25 | NP-5 |

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Rock outcrop.

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### TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

| Soil name and | Depth | USDA texture | Classification | Frac- | Percentage passing sieve number-- | Liquid limit | plasticity index |
| map symbol   |       |             |               | ments | inches | 4 | 10 | 40 | 200 | Pct |                |                |
| In           |       |             |               |       | Pct    |   |    |    |     |    |                |                |

**663**:  
Beoska--------  
0-13 Very fine sandy loam.  
13-25 Silt loam, silty clay loam.  
25-44 Stratified gravelly very fine sandy loam to gravelly sandy loam.  
44-60 Stratified gravelly sandy loam.  

**664**:  
Oxcorel--------  
0-8 Gravelly very fine sandy loam.  
8-34 Clay, clay loam.  
34-60 Very gravelly sandy loam, very gravelly loam.  

**Golconda**:  
0-10 Silt loam.  
10-23 Gravelly clay loam.  
23-36 Cemented layer.  
36-60 Stratified gravelly sandy loam to gravelly loamy coarse sand.  

**665**:  
Oxcorel--------  
0-8 Gravelly very fine sandy loam.  
8-34 Clay, clay loam.  
34-60 Very gravelly sandy loam, very gravelly loam.  

**Trocken Variant**:  
0-5 Very gravelly loam.  
5-60 Stratified extremely gravelly loamy sand.  

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| map symbol | Depth | USDA texture | Unified | AASHTO | > 3 sieve number | inches | 4 | 10 | 40 | 200 | Pct | Pct |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Rezave | 0-3 | Extremely stony | SM | A-4 | 35-45 | 90-100 | 85-95 | 60-80 | 35-50 | 20-25 | NP-5 |
| | | very fine sandy | | | | | | | | |
| | 3-14 | Clay, clay loam, | CL, CH | A-7 | 5-30 | 90-100 | 90-100 | 80-100 | 65-95 | 40-60 | 15-35 |
| | | stony clay. | | | | | | | | |
| | 14-16 | Very gravelly | SC, CL | A-7 | 5-10 | 80-90 | 90-90 | 70-70 | 35-60 | 40-50 | 15-25 |
| | | clay, gravelly | | | | | | | | |
| | | clay loam. | | | | | | | | |
| | 16-20 | Unweathered | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | bedrock. | | | | | | | | |
| Rubble land. | | | | | | | | | |
| | | fine sandy loam. | | | | | | | | |
| | 4-18 | Clay, gravelly | GC, CL, CH | A-7 | 0-5 | 60-95 | 55-90 | 50-80 | 40-70 | 40-55 | 20-30 |
| | | clay, gravelly | | | | | | | | |
| | | clay loam. | | | | | | | | |
| | 18-34 | Indurated layer-- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 34-60 | Very gravelly | GM | A-1 | 5-15 | 35-55 | 30-50 | 20-35 | 10-20 | --- | NP |
| | | coarse sandy | | | | | | | | |
| | | loam, very | | | | | | | | |
| | | gravelly sandy | | | | | | | | |
| | | loam, very | | | | | | | | |
| | | gravelly loamy | | | | | | | | |
| | | sand. | | | | | | | | |
| | | fine sandy loam. | | | | | | | | |
| | 2-14 | Fine sandy loam, | ML, SM | A-4 | 0 | 60-100 | 75-90 | 65-85 | 35-55 | 15-25 | NP-5 |
| | | very fine sandy | | | | | | | | |
| | | loam. | | | | | | | | |
| | 14-29 | Indurated layer-- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | gravelly sandy | | | | | | | | |
| | | loam, very | | | | | | | | |
| | | gravelly loamy | | | | | | | | |
| | | sand. | | | | | | | | |
| Wholan | 0-5 | Silt loam-------- | ML | A-4 | 0 | 100 | 100 | 95-100 | 80-90 | 20-30 | NP-5 |
| | 5-60 | Very fine sandy | ML | A-4 | 0 | 100 | 100 | 95-100 | 75-90 | 20-30 | NP-5 |
| | | loam, silt loam. | | | | | | | | |
| | | fine sandy loam. | | | | | | | | |
| | 4-18 | Clay, gravelly | GC, CL, CH | A-7 | 0-5 | 60-95 | 55-90 | 50-80 | 40-70 | 40-55 | 20-30 |
| | | clay, gravelly | | | | | | | | |
| | | clay loam. | | | | | | | | |
| | 18-34 | Indurated layer-- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 34-60 | Very gravelly | GM | A-1 | 5-15 | 35-55 | 30-50 | 20-35 | 10-20 | --- | NP |
| | | coarse sandy | | | | | | | | |
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| | | gravelly sandy | | | | | | | | |
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| | | | | | In | Pct | | Pct | |
| 1340*: | | | | | | | | | |
| Colbar | 0-1 | Very cobbly loam | | CL-ML | A-4 | 50-60 | 90-100 | 85-95 | 75-85 | 50-60 | 20-30 | 5-10 | |
| | 1-24 | Cobbly loam, gravelly clay loam, cobbly clay loam | | CL | A-6 | 10-35 | 90-95 | 70-85 | 60-80 | 50-65 | 30-40 | 10-20 | |
| | 24-28 | Unweathered bedrock | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| 1350*: | | | | | | | | | |
| | 17-21 | Unweathered bedrock | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| Reluctan | 0-9 | Gravelly loam | | SM-SC, CL-ML | A-4 | 5-10 | 70-80 | 60-75 | 50-65 | 40-55 | 25-30 | 5-10 | |
| | 9-25 | Gravelly clay loam, gravelly loam | | GC, CL | A-6, A-7 | 0-15 | 65-85 | 60-75 | 55-75 | 40-60 | 35-45 | 15-20 | |
| | 25-29 | Unweathered bedrock | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| 1360*: | | | | | | | | | |
| | 8-12 | Unweathered bedrock | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| | 10-14 | Unweathered bedrock | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| Rock outcrop | | | | | | | | | |

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**Rock outcrop.**

| **1480**: Tusel-------- | 0-12 | Cobbly loam | SM, ML, A-4 | 15-35 | 80-95 | 75-90 | 55-70 | 40-55 | 20-30 | NP-10 |
|                         | 42-46 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- |

**Rock outcrop.**

|                         | 14-18 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- |

**Rock outcrop.**

|                         | 38-42 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- |

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### TABLE 5.—ENGINEERING INDEX PROPERTIES—Continued

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**1501***: Beoska

- 13-25 | Silt loam, silty clay loam, clay loam. | CL | A-6, A-7 | 0 | 80-100 | 75-100 | 70-85 | 60-85 | 35-45 | 15-25 |
- 25-44 | Stratified | SM, GM | A-1, A-2 | 0-10 | 60-80 | 55-70 | 30-50 | 20-35 | --- | NP |

**1510***: Locane

- 0-2 | Cobbly loam— | CL-ML, SM-SC | A-4 | 25-40 | 80-100 | 60-80 | 45-60 | 20-30 | 5-10 |
- 16-20 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |

Rock outcrop.

**1530***: Polum

- 0-7 | Gravelly silt loam. | GM, ML | A-4 | 0-10 | 55-80 | 50-75 | 45-70 | 35-55 | 30-35 | NP-5 |

Dekoom

- 3-13 | Gravelly silt loam, gravelly loam. | GM | A-2, A-4 | 0 | 60-70 | 50-60 | 45-60 | 30-50 | 30-35 | NP-5 |

Polum Variant

- 23 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |

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1650*:
- **Appian**
  - 0-4 | Loam---------- | CL-ML | A-4 | 0 | 95-100 | 90-100 | 75-95 | 55-70 | 20-30 | 5-10 |
  - 4-9 | Clay loam, sandy | SC, CL | A-6, A-7 | 0 | 95-100 | 90-100 | 75-90 | 40-60 | 35-45 | 15-20 |
  - 9-25 | Stratified sand | SM | A-2 | 0 | 75-100 | 75-90 | 50-65 | 10-25 | --- | NP |
  - 25-60 | Sand, coarse sand | SP, SP-SM | A-1 | 0 | 85-100 | 75-90 | 30-50 | 0-10 | --- | NP |

1660*:
- **Biddleman**
  - 3-13 | Gravelly loam---- | SC, GC | A-2, A-6 | 0-5 | 60-75 | 55-65 | 40-55 | 30-45 | 30-35 | 10-15 |
  - 13-60 | Stratified | GP | A-1 | 5-15 | 10-30 | 10-20 | 5-10 | 0-5 | --- | NP |

**Trocken**
  - 3-60 | Stratified | GM-GC, | A-2 | 5-40 | 20-60 | 15-40 | 10-35 | 5-25 | 20-30 | 5-10 |
  - 13-60 | Stratified | GP-GC | A-2 | 5-15 | 10-30 | 10-20 | 5-10 | 0-10 | --- | NP |

**Biddleman**
  - 3-13 | Gravelly clay | SC, GC | A-2, A-6 | 0-5 | 60-75 | 55-65 | 40-55 | 30-45 | 30-35 | 10-15 |
  - 13-60 | Stratified | GP-GM | A-1 | 5-15 | 10-30 | 10-20 | 5-10 | 0-10 | --- | NP |

3000*:
- **Jobpeak**
  - 5-9 | Unweathered | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Teguro**
  - 2-19 | Gravelly clay | SC | A-2, A-6 | 0-10 | 65-80 | 50-75 | 35-60 | 30-50 | 30-40 | 15-20 |
  - 19-23 | Unweathered | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Rock outcrop**

**Bedwyrr**
- 0-3 | Stony loam----- | SC, CL | A-6 | 10-25 | 80-95 | 60-75 | 50-65 | 40-55 | 25-35 | 10-15 |
  - 3-15 | Clay, silty clay | CH | A-7 | 0 | 95-100 | 90-100 | 90-100 | 70-80 | 50-60 | 25-30 |

See footnote at end of table.
| Soil name and | Depth | USDA texture | Classification | Frac- | Percentage passing | Liquid | Plas- |
| map symbol | | | | ments | sieve number-- | limit | ticity |
| | | | | Unified | AASHTO | > 3 | inches | 4 | 10 | 40 | 200 | index |
| 3010*: | | | | | | | | In | Pct | | |
| Bedzee-------- | 0-4 | Very stony loam | CL | A-6 | 10-15 | 90-100 | 90-100 | 65-80 | 50-60 | 30-35 | 10-15 |
| | 4-10 | Gravelly clay---- | CH | A-7 | 0-5 | 80-90 | 65-75 | 55-70 | 50-65 | 50-65 | 25-40 |
| | 10-14 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5-9 | Unweathered bedrock. | --- | A-4 | --- | --- | --- | --- | --- | --- | --- |
| 3020*: | | | | | | | | | | | |
| | 6-22 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-26 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Rock outcrop. | | | | | | | | | | | |
| 3030*: | | | | | | | | | | | |
| | 8-15 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-19 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Rock outcrop. | | | | | | | | | | | |
| | 8-15 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-19 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3031*: | | | | | | | | | | | |
| | 8-15 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-19 | Unweathered bedrock. | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5-9 | Unweathered bedrock. | --- | A-4 | --- | --- | --- | --- | --- | --- | --- |
| Rock outcrop. | | | | | | | | | | | |

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</tr>
<tr>
<td>Singatse</td>
<td>Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents</td>
</tr>
<tr>
<td>Slaven</td>
<td>Clayey-skeletal, montmorillonitic, frigid Aridic Argixerolls</td>
</tr>
<tr>
<td>Slav</td>
<td>Fine-silty, mixed (calcareous), mesic Typic Torriorthents</td>
</tr>
<tr>
<td>Snapp</td>
<td>Clayey over sandy or sandy-skeletal, montmorillonitic, mesic Durixerollic Natargids</td>
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<td>Snowmore</td>
<td>Fine-loamy, mixed, mesic Xerollic Durargids</td>
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<td>Sodhouse</td>
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<td>Sonda</td>
<td>Fine-silty, mixed (calcareous), mesic Typic Torriorthents</td>
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<td>Sonoma</td>
<td>Fine-silty, mixed (calcareous), mesic Aquic Fluvaquents</td>
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<td>Spinlin</td>
<td>Clayey-skeletal, montmorillonitic Argic Cryoborolls</td>
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<tr>
<td>Sumine</td>
<td>Loamy-skeletal, mixed, frigid Aridic Argixerolls</td>
</tr>
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<td>Sumiya</td>
<td>Clayey-skeletal, montmorillonitic, nonacid, frigid Lithic Xerollic Torriorthents</td>
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<td>Swingler</td>
<td>Fine-silty, mixed (calcareous), mesic Typic Torriorthents</td>
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<td>Teguo</td>
<td>Loamy, mixed, frigid Lithic Argixerolls</td>
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<tr>
<td>Tenabo</td>
<td>Loamy, mixed, mesic, shallow Typic Natdurargids</td>
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<td>Theon</td>
<td>Loamy-skeletal, mixed, mesic Lithic Haplargids</td>
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<tr>
<td>Toulon</td>
<td>Sandy-skeletal, mixed, mesic Typic Camborthids</td>
</tr>
<tr>
<td>Trocken</td>
<td>Loamy-skeletal, mixed (calcareous), mesic Typic Torriorthents</td>
</tr>
<tr>
<td>Trocken Variant</td>
<td>Loamy-skeletal, mixed (calcareous), mesic Xerollic Torriorthents</td>
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<tr>
<td>Trunk</td>
<td>Fine, montmorillonitic, mesic Xerollic Haplargids</td>
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<tr>
<td>Tuset</td>
<td>Loamy-skeletal, mixed Argic Pachic Cryoborolls</td>
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<td>Urignes</td>
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<td>Valmy</td>
<td>Coarse-loamy, mixed (calcareous), mesic Durothordic Torriorthents</td>
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<tr>
<td>Wendane</td>
<td>Fine-silty, mixed (calcareous), mesic Aquic Haplargids</td>
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<tr>
<td>Wereld</td>
<td>Loamy-skeletal, mixed, frigid Aridic Calcorthids</td>
</tr>
<tr>
<td>Weso</td>
<td>Loamy-skeletal, mixed, mesic Duric Camborthids</td>
</tr>
<tr>
<td>Soil name</td>
<td>Family or higher taxonomic class</td>
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<tr>
<td>----------------</td>
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<tr>
<td>Whirlo</td>
<td>Loamy-skeletal, mixed, mesic Typic Camborthids</td>
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<td>Wholan</td>
<td>Coarse-silty, mixed, mesic Typic Camborthids</td>
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<td>Wiskan</td>
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<tr>
<td>Woolsey</td>
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<td>Xipe</td>
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<td>Yipor</td>
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<tr>
<td>Yobe</td>
<td>Fine-silty, mixed (calcareous), mesic Aeric Halaquepts</td>
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<tr>
<td>Yobe Variant</td>
<td>Fine, montmorillonitic (calcareous), mesic Aeric Halaquepts</td>
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</tbody>
</table>
Rangeland Plants and Woodland Understory
110--Adelaide silt loam, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
<tr>
<td>Thurbere needlegrass</td>
<td>STTH2</td>
<td>Adelaide</td>
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<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>10-20</td>
<td>---</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td></td>
<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td></td>
<td>5-15</td>
</tr>
<tr>
<td>Needlethread</td>
<td>STCO4</td>
<td></td>
<td>5-15</td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td></td>
<td>5-15</td>
</tr>
<tr>
<td>Globemallow</td>
<td>SPHEAE</td>
<td>1-2</td>
<td>5-15</td>
</tr>
<tr>
<td>Phlox</td>
<td>PHLOX</td>
<td>1-2</td>
<td>5-15</td>
</tr>
<tr>
<td>Other perennial forbs</td>
<td>PFFF</td>
<td>1-2</td>
<td>5-15</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
<td>1-2</td>
<td>5-15</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>1-2</td>
<td>5-15</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>1-2</td>
<td>5-15</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>1-2</td>
<td>5-15</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULAS5</td>
<td>1-2</td>
<td>5-15</td>
</tr>
</tbody>
</table>

Potential production (lb/acre):
- Favorable years: 700
- Normal years: 450
- Unfavorable years: 300
112--Adelaide silt loam, 4 to 15 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td></td>
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<td>Thurber needlegrass</td>
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<tr>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>2-10</td>
<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>2-10</td>
<td>2-5</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td>1-3</td>
<td>1-3</td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>1-2</td>
<td>---</td>
</tr>
<tr>
<td>Globemallow</td>
<td>SPHAE</td>
<td>1-2</td>
<td>---</td>
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<tr>
<td>Phlox</td>
<td>PHLOX</td>
<td>1-2</td>
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</tr>
<tr>
<td>Other perennial forbs</td>
<td>PFFF</td>
<td>2-8</td>
<td>2-8</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
<td>30-35</td>
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</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>5-15</td>
<td>2-5</td>
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<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>30-40</td>
<td>30-40</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>20-30</td>
<td>20-30</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULA5</td>
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<td>2-5</td>
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Range site number        | 024X02ON     | 024X02ON   | 024X02ON   | 024X02ON   |
Potential production (lb/acre):
Favorable years         | 700          | 700        | 700        | 700        |
Normal years             | 450          | 450        | 450        | 450        |
Unfavorable years        | 300          | 300        | 300        | 300        |
113--Adelaide silt loam, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Adelaide</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tr>
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<td>ORHY</td>
<td>5-15</td>
<td>5-15</td>
<td>5-15</td>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>2-10</td>
<td>5-15</td>
<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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<td>2-5</td>
<td>2-5</td>
</tr>
<tr>
<td>Needleleandthread</td>
<td>STCO4</td>
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<tr>
<td>Tappertip hawksbeard</td>
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<td>Philox</td>
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</tr>
<tr>
<td>Other perennial forbs</td>
<td>PPFF</td>
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<td>2-8</td>
<td>2-8</td>
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<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
<td>30-35</td>
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<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
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<td>2-5</td>
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<td>ATCO</td>
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<tr>
<td>Winterfat</td>
<td>EULA5</td>
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<td>2-5</td>
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</table>

Potential production (lb/acre):

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<th>024X002N</th>
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<tr>
<td>Favorable years</td>
<td>700</td>
<td>700</td>
<td>700</td>
<td>700</td>
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<tr>
<td>Normal years</td>
<td>450</td>
<td>450</td>
<td>450</td>
<td>450</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>300</td>
<td>300</td>
<td>300</td>
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</table>
120--Hawsley sand, moderately wet, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>40-50</td>
<td>40-50</td>
<td>2-5</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCC04</td>
<td>10-20</td>
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<tr>
<td>Basin wildrye</td>
<td>ELCL2</td>
<td>2-5</td>
<td>2-5</td>
<td>5-20</td>
</tr>
<tr>
<td>Sand dropseed</td>
<td>SPCR</td>
<td>1-2</td>
<td>1-2</td>
<td>---</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>---</td>
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<td>2-5</td>
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<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
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<tr>
<td>Other perennial grasses</td>
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<td>Thelypody</td>
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<tr>
<td>Other perennial forbs</td>
<td>FPPF</td>
<td>5-10</td>
<td>5-10</td>
<td>---</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>10-15</td>
<td>10-15</td>
<td>20-30</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EUA5</td>
<td>5-10</td>
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<tr>
<td>Nevada dales</td>
<td>PPSO</td>
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<td>2-5</td>
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<tr>
<td>Basin big sagebrush</td>
<td>ARTRT</td>
<td>---</td>
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<td>5-15</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
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</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
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</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
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</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
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</tr>
<tr>
<td>Other shrubs</td>
<td>SSSS</td>
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Range site number

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<td>Potential production (lb/acre):</td>
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<tr>
<td>Favorable years</td>
<td>500</td>
<td>500</td>
<td>800</td>
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<tr>
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<td>Unfavorable years</td>
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<td>300</td>
<td>350</td>
<td>50</td>
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</tbody>
</table>
121--Hawsley fine sand, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
<tr>
<td></td>
<td></td>
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<tr>
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<td>ORHY</td>
<td>30-50</td>
<td>10-20</td>
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</tr>
<tr>
<td>Needleleandthread</td>
<td>STCO4</td>
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<td>5-10</td>
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</tr>
<tr>
<td>Inland saltgrass</td>
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</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
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<td>5-15</td>
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<td>Perennial forbs</td>
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<td>Fourwing saltbush</td>
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<td>40-60</td>
</tr>
<tr>
<td>Shadscale</td>
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<td>2-10</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
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<td>2-5</td>
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<tr>
<td>Other shrubs</td>
<td>SSSS</td>
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<td>5-20</td>
<td>5-15</td>
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</table>

Range site number          | 027X009N     | 027X016N     | 027X025N     |

Potential production (lb/acre):

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</tr>
<tr>
<td>Normal years</td>
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<td>200</td>
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</tr>
<tr>
<td>Unfavorable years</td>
<td>200</td>
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</tbody>
</table>
122--Hawsley-Ragtown association

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community.)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Soil name</td>
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<td></td>
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<td>Indian ricegrass</td>
<td>ORHY</td>
<td>30-50</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCD4</td>
<td>2-10</td>
</tr>
<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>5-10</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCL2</td>
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<td>Other perennial grasses</td>
<td>PPGG</td>
<td>2-10</td>
</tr>
<tr>
<td>Thelypody</td>
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<td>PFFF</td>
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<td>Seepweed</td>
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<td>2-5</td>
</tr>
<tr>
<td>Basin big sagebrush</td>
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</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
<td>---</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>---</td>
</tr>
<tr>
<td>Bailey greasewood</td>
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<td>---</td>
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<tr>
<td>Bud sagebrush</td>
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Range site number

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131—Jerval-Chilper-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tr>
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<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Indian ricegrass</td>
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<td>SUAED</td>
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<tr>
<td>Littleleaf horsebrush</td>
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<tr>
<td>Rubber rabbitbrush</td>
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<td>Spiny hopsage</td>
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<tr>
<td>Burrobrush</td>
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</tr>
<tr>
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<tr>
<td>Other shrubs</td>
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Range site number: O27X028N O27X028N O27X030N O27X028N O27X024N O27X022N

Potential production (lb/acre):

- Favorable years: 700 700 400 700 600 400
- Normal years: 500 500 300 500 400 200
- Unfavorable years: 300 300 200 300 200 50
132--Jerval-Knoss-Chilper association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
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</tr>
<tr>
<td>Inland saltgrass</td>
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</tr>
<tr>
<td>Thurber needlegrass</td>
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<td>2-5</td>
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<tr>
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<tr>
<td>Black greasewood</td>
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</tr>
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<td>Seepweed</td>
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<td>Littleleaf horsebrush</td>
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<td>Rubber rabbitbrush</td>
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Range site number: 027X028N 027X028N 027X030N 027X028N 027X024N 027X022N 027X032N

Potential production (lb/acre):

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<td>400</td>
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## 133--Jerval-Trocken-Golconda association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
<td>Indian ricegrass</td>
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</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SINV</td>
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</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
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</tr>
<tr>
<td>Perennial forbs</td>
<td>PPPF</td>
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</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td></td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td></td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
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</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
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<tr>
<td>Nevada ephedra</td>
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### 144--Beoska-Tenabo-Dun Glen association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
<td>Needleandthread</td>
<td>STCO4</td>
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<td>1-3</td>
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<tr>
<td>Thurber needlegrass</td>
<td>STTH2</td>
<td>---</td>
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</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>---</td>
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</tr>
<tr>
<td>Globemallow</td>
<td>SPHAE</td>
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<tr>
<td>Phlox</td>
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### 146--Beoska-Oxcorel-Whirlo association

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<td></td>
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<tr>
<td>Bottlebrush squirreltail</td>
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<td>Sandberg bluegrass</td>
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<tr>
<td>Other perennial grasses</td>
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<tr>
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**Range site number**

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</tbody>
</table>

**Potential production (lb/acre):**

- Favorable years
- Normal years
- Unfavorable years
151--Blackhawk silt loam, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Soil name</td>
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<td>Sandberg bluegrass</td>
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<td>Needleleandthread</td>
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<tr>
<td>Thurber needlegrass</td>
<td>STTH2</td>
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161—Bliss-Chiara association, sloping

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<td>Other shrubs</td>
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Range site number: 024X020N       024X005N       024X022N       024X005N

Potential production (lb/acre):

Favorable years: 700 800 800 800
Normal years: 450 600 600 600
Unfavorable years: 300 400 350 400
162--Bliss-Chiara association, moderately steep

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<td>Sandberg bluegrass</td>
<td>POSE</td>
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<td>Bluebunch wheatgrass</td>
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<tr>
<td>Needleandthread</td>
<td>STCO4</td>
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<td>Thicksipe wheatgrass</td>
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Potential production (lb/acre):
- Favorable years: 700 800 800 700 700
- Normal years: 450 600 500 450 450
- Unfavorable years: 300 400 300 300 300
170--Shabliss-Enko-Valmy association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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180--Chiara stony very fine sandy loam, 2 to 4 percent slopes
(The letter "t" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<td>Basin big sagebrush</td>
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<td>Other shrubs</td>
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Range site number

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<th>Potential production (lb/acre):</th>
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024X005N
190--Theon-Singatse-Rock outcrop association
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>10-20</td>
<td>10-20</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
<td>5-10</td>
<td>5-15</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>5-10</td>
<td>2-10</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULA5</td>
<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Nevada ephedra</td>
<td>EPNE</td>
<td>---</td>
<td>2-5</td>
</tr>
<tr>
<td>Black sagebrush</td>
<td>ARABN</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Other shrubs</td>
<td>SSSS</td>
<td>---</td>
<td>5-10</td>
</tr>
</tbody>
</table>

Range site number
- 027X019N
- 027X027N
- None
- 027X028N
- 027X019N
- 027X030N
- 027X032N

Potential production (lb/acre):
- Favorable years: 350 200 --- 700 350 400 600
- Normal years: 200 100 --- 500 200 300 400
- Unfavorable years: 50 50 --- 300 50 200 200
191--Theon-Singatse association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Soil name</td>
</tr>
<tr>
<td>Galleta</td>
<td>HLJA</td>
<td>5-15</td>
</tr>
<tr>
<td>Desert needlegrass</td>
<td>STSP3</td>
<td>5-15</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>2-10</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>2-10</td>
</tr>
<tr>
<td>Bluegrass</td>
<td>FOA++</td>
<td>---</td>
</tr>
<tr>
<td>Thurber needlegrass</td>
<td>STTH2</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPPG</td>
<td>---</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PPPF</td>
<td>5-10</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>10-20</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
<td>5-10</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARBF5</td>
<td>5-10</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EUL5</td>
<td>2-5</td>
</tr>
<tr>
<td>Nevada ephedra</td>
<td>EPNE</td>
<td>---</td>
</tr>
<tr>
<td>Littleleaf horsebrush</td>
<td>TEGL</td>
<td>---</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td>---</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSF</td>
<td>---</td>
</tr>
<tr>
<td>Burrobrush</td>
<td>NYMEN3</td>
<td>---</td>
</tr>
<tr>
<td>Fourwing saltbush</td>
<td>ATCA2</td>
<td>---</td>
</tr>
<tr>
<td>Black sagebrush</td>
<td>ARARN</td>
<td>---</td>
</tr>
<tr>
<td>Other shrubs</td>
<td>SSSS</td>
<td>---</td>
</tr>
</tbody>
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Range site number:

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<th>O27X022N</th>
<th>None</th>
<th>O27X019N</th>
<th>O27X032N</th>
</tr>
</thead>
</table>
| Potential production (lb/acre):
| Favorable years | 350 | 200 | 400 | --- | 350 | 600 |
| Normal years | 200 | 100 | 200 | --- | 200 | 400 |
| Unfavorable years | 50 | 50 | 50 | --- | 50 | 200 |
# 201--Pirouette-Rezave-Rubble land association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pirouette</td>
<td>Rezave</td>
</tr>
<tr>
<td>Bluegrass</td>
<td>POA++</td>
<td>10-30</td>
<td>10-30</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>---</td>
<td>2-10</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Desert needlegrass</td>
<td>STSP3</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Pine bluegrass</td>
<td>POSC</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Thurbert needlegrass</td>
<td>STTH2</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td>5-15</td>
<td>---</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
<td>2-5</td>
<td>5-10</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>20-30</td>
<td>10-20</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>10-20</td>
<td>5-10</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
<td>---</td>
<td>5-10</td>
</tr>
<tr>
<td>Nevada ephedra</td>
<td>EPNE</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSF</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Black sagebrush</td>
<td>ARARN</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Other shrubs</td>
<td>SSSS</td>
<td>5-10</td>
<td>5-15</td>
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Range site number

<table>
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<th>None</th>
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<th>027X008N</th>
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<tbody>
<tr>
<td>Potential production (lb/acre):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Favorable years</td>
<td>700</td>
<td>400</td>
<td>---</td>
<td>200</td>
<td>700</td>
<td>600</td>
</tr>
<tr>
<td>Normal years</td>
<td>500</td>
<td>300</td>
<td>---</td>
<td>100</td>
<td>500</td>
<td>400</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>300</td>
<td>200</td>
<td>---</td>
<td>50</td>
<td>300</td>
<td>200</td>
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</tbody>
</table>
### 211--Preble Variant-Whirlo association

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
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<td>Soil name</td>
<td>Preble Variant</td>
<td>Whirlo</td>
<td>Inclusion number--</td>
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<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td>5-20</td>
<td>---</td>
<td>20-40</td>
<td>---</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>2-5</td>
<td>5-15</td>
<td>---</td>
<td>5-10</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>2-5</td>
<td>5-15</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>---</td>
<td>2-5</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td>---</td>
<td>1-3</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PFGG</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>T-10</td>
</tr>
<tr>
<td>Thelypody</td>
<td>THELY</td>
<td>2-4</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial forbs</td>
<td>PFFF</td>
<td>---</td>
<td>2-8</td>
<td>2-8</td>
<td>2-8</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>20-30</td>
<td>---</td>
<td>5-15</td>
<td>15-30</td>
</tr>
<tr>
<td>Basin big sagebrush</td>
<td>ARTRT</td>
<td>5-15</td>
<td>---</td>
<td>2-10</td>
<td>---</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
<td>5-10</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>5-15</td>
<td>2-5</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>---</td>
<td>30-40</td>
<td>---</td>
<td>30-50</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>---</td>
<td>20-30</td>
<td>---</td>
<td>5-15</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULA5</td>
<td>---</td>
<td>2-5</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Torrey quailbush</td>
<td>ATTO</td>
<td>---</td>
<td>---</td>
<td>30-50</td>
<td>---</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
<td>---</td>
<td>---</td>
<td>2-15</td>
<td>---</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range site number</th>
<th>024X022N</th>
<th>024X002N</th>
<th>024X015N</th>
<th>024X003N</th>
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<tbody>
<tr>
<td>Potential production (lb/acre):</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Favorable years</td>
<td>800</td>
<td>700</td>
<td>1,500</td>
<td>600</td>
</tr>
<tr>
<td>Normal years</td>
<td>600</td>
<td>450</td>
<td>1,200</td>
<td>450</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>350</td>
<td>300</td>
<td>800</td>
<td>300</td>
</tr>
</tbody>
</table>
220--Duffer silty clay loam
(The letter "t" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Soil name</td>
</tr>
<tr>
<td>Alkali sacaton</td>
<td>SPAI</td>
<td></td>
</tr>
<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td></td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELIC12</td>
<td></td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td></td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PFFG</td>
<td></td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
<td></td>
</tr>
<tr>
<td>Iodinebush</td>
<td>ALOC2</td>
<td></td>
</tr>
<tr>
<td>Saltbush</td>
<td>ATRIP</td>
<td></td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td></td>
</tr>
<tr>
<td>Alkali rabbitbrush</td>
<td>CHAL9</td>
<td></td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td></td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td></td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td></td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
<td></td>
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Range site number
<table>
<thead>
<tr>
<th></th>
<th>024X010N</th>
<th>024X007N</th>
<th>024X011N</th>
<th>024X011N</th>
<th>024X003N</th>
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</thead>
<tbody>
<tr>
<td>Potential production (lb/acre):</td>
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</tr>
<tr>
<td>Favorable years</td>
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<td>1,900</td>
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<tr>
<td>Normal years</td>
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<td>1,400</td>
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<td>350</td>
<td>450</td>
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<tr>
<td>Unfavorable years</td>
<td>150</td>
<td>800</td>
<td>200</td>
<td>200</td>
<td>300</td>
</tr>
</tbody>
</table>
221--Duffer silty clay loam, occasionally flooded, slightly saline

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Soil name</td>
<td>Inclusion number--</td>
</tr>
<tr>
<td></td>
<td>Duffer</td>
<td>1</td>
</tr>
<tr>
<td>Alkali sacaton</td>
<td>SPAI</td>
<td>15-40</td>
</tr>
<tr>
<td>Alkali muhly</td>
<td>MUAS</td>
<td>10-20</td>
</tr>
<tr>
<td>Alkali bluegrass</td>
<td>POJU</td>
<td>5-15</td>
</tr>
<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>5-10</td>
</tr>
<tr>
<td>Alkali cordgrass</td>
<td>SPGR</td>
<td>5-10</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELC12</td>
<td>2-5</td>
</tr>
<tr>
<td>Western wheatgrass</td>
<td>AGSM</td>
<td>---</td>
</tr>
<tr>
<td>Arrow-grass</td>
<td>TRIGL</td>
<td>1-3</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PPFF</td>
<td>---</td>
</tr>
<tr>
<td>Silver buffaloberry</td>
<td>SHAR</td>
<td>T-2</td>
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<tr>
<td>Willow</td>
<td>SALIX</td>
<td>T-2</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td>T-2</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVN4</td>
<td>T-2</td>
</tr>
<tr>
<td>Woods rose</td>
<td>ROWO</td>
<td>T-2</td>
</tr>
<tr>
<td>Basin big sagebrush</td>
<td>ARTRT</td>
<td>---</td>
</tr>
</tbody>
</table>

Range site number

<table>
<thead>
<tr>
<th></th>
<th></th>
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<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>500</td>
<td>500</td>
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<tr>
<td>Normal years</td>
<td>1,000</td>
<td>1,100</td>
<td>1,000</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>700</td>
<td>600</td>
<td>700</td>
<td>200</td>
<td>200</td>
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</tbody>
</table>
231--Dun Glen very fine sandy loam, 2 to 4 percent slopes
(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Dun Glen</td>
<td></td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>5-15</td>
<td>5-10</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-15</td>
<td>---</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td>1-3</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td>---</td>
<td>T-10</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFFF</td>
<td>2-8</td>
<td>2-8</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>30-40</td>
<td>30-50</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>20-30</td>
<td>5-15</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULA5</td>
<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>---</td>
<td>15-30</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
<td>---</td>
<td>2-15</td>
</tr>
</tbody>
</table>

Range site number

Potential production (lb/acre):
- Favorable years: 700
- Normal years: 450
- Unfavorable years: 300
233--Dun Glen very fine sandy loam, 0 to 2 percent slopes

(The letter "x" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Soil name</td>
<td>Inclusion number--</td>
</tr>
<tr>
<td></td>
<td>Dun Glen</td>
<td>1</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>5-15</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-15</td>
</tr>
<tr>
<td>Sandberg Bluegrass</td>
<td>POSE</td>
<td>2-5</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td>1-3</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td></td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PPPP</td>
<td>2-8</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>30-40</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>20-30</td>
</tr>
<tr>
<td>Spiny hopssage</td>
<td>GRSP</td>
<td>2-5</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULA5</td>
<td>2-5</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td></td>
</tr>
<tr>
<td>Sheepweed</td>
<td>SUAED</td>
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Range site number

<table>
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<tr>
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<th>024X003N</th>
<th>024X002N</th>
<th>024X004N</th>
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<td>Potential production (lb/acre):</td>
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<tr>
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<td>500</td>
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<td>Normal years</td>
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<td>450</td>
<td>450</td>
<td>350</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>200</td>
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</table>
234--Dun Glen silt loam, frequently flooded, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tbody>
<tr>
<td></td>
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<td>Soil name</td>
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<tr>
<td>Indian ricegrass</td>
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<td>Dun Glen</td>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td></td>
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<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td></td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td></td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
<td></td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULAS5</td>
<td></td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td></td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td></td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
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Range site number

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<td>Normal years</td>
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<tr>
<td>Unfavorable years</td>
<td>200</td>
<td>300</td>
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</table>
### 241--Toulon-Mazuma-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
</tr>
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<tbody>
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<td>Bluegrass</td>
<td>POA++</td>
<td></td>
<td>Toulon</td>
<td>Mazuma</td>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
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<td>---</td>
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<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td></td>
<td>---</td>
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<tr>
<td>Basin wildrye</td>
<td>ELC12</td>
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<td>Alkali sacaton</td>
<td>SFAI</td>
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<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td></td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td></td>
<td>---</td>
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</tr>
<tr>
<td>Other perennial grasses</td>
<td>FPFG</td>
<td></td>
<td>---</td>
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</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td></td>
<td>10-20</td>
<td>2-10</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
<td></td>
<td>5-10</td>
<td>---</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td></td>
<td>5-10</td>
<td>---</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td></td>
<td>---</td>
<td>40-60</td>
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<tr>
<td>Seepweed</td>
<td>SUAD</td>
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<td>2-5</td>
</tr>
<tr>
<td>Torrey quailbush</td>
<td>ATTO</td>
<td></td>
<td>---</td>
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</tr>
<tr>
<td>Idaho bush</td>
<td>ALOC2</td>
<td></td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Pouring saltbush</td>
<td>ATCA2</td>
<td></td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULA5</td>
<td></td>
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<td>---</td>
</tr>
<tr>
<td>Nevada dalea</td>
<td>PSPO</td>
<td></td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Other shrubs</td>
<td>SSBS</td>
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Range site number

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<th>027X03N</th>
<th>027X044N</th>
<th>027X024N</th>
<th>027X009N</th>
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</table>

Potential production (lb/acre):

- Favorable years: 400 400 400 600 600 800
- Normal years: 300 200 300 400 400 450
- Unfavorable years: 200 50 200 200 200 200
### 251--Whiro-Beoska-Oxcorel association

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
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<th>Beoska</th>
<th>Oxcorel</th>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>5-15</td>
<td>5-15</td>
<td>5-15</td>
<td>5-15</td>
<td>2-10</td>
<td>5-10</td>
<td>5-15</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-15</td>
<td>5-15</td>
<td>5-15</td>
<td>5-15</td>
<td>5-10</td>
<td>---</td>
<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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<td>2-5</td>
<td>2-5</td>
<td>2-5</td>
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<td>2-5</td>
</tr>
<tr>
<td>Needledthread</td>
<td>STCO4</td>
<td>1-3</td>
<td>1-3</td>
<td>1-3</td>
<td>1-3</td>
<td>---</td>
<td>---</td>
<td>1-3</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td>---</td>
<td>---</td>
<td>---</td>
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<td>---</td>
<td>T-10</td>
<td>---</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PPF1</td>
<td>2-8</td>
<td>2-8</td>
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<td>Shadscale</td>
<td>ATCO</td>
<td>30-40</td>
<td>30-40</td>
<td>30-40</td>
<td>30-40</td>
<td>---</td>
<td>30-50</td>
<td>30-40</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>2-5</td>
<td>2-5</td>
<td>2-5</td>
<td>2-5</td>
<td>5-20</td>
<td>---</td>
<td>2-5</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULA5</td>
<td>2-5</td>
<td>2-5</td>
<td>2-5</td>
<td>2-5</td>
<td>---</td>
<td>---</td>
<td>2-5</td>
</tr>
<tr>
<td>Littleleaf horsebrush</td>
<td>TEGl</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>5-25</td>
<td>---</td>
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</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>5-20</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>5-20</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Burrobrush</td>
<td>HYMEN3</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>5-10</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Fourwing saltbush</td>
<td>ATCA2</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>5-10</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>15-30</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
<td>---</td>
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<td>---</td>
<td>---</td>
<td>2-15</td>
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</table>

**Range site number:**

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<tbody>
<tr>
<td>Potential production (lb/acre):</td>
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</tr>
<tr>
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<td>700</td>
<td>700</td>
<td>700</td>
<td>400</td>
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<td>Normal years</td>
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<td>450</td>
<td>450</td>
<td>200</td>
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<td>450</td>
</tr>
<tr>
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<td>300</td>
<td>300</td>
<td>50</td>
<td>300</td>
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</tbody>
</table>
260--Golconda silt loam, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>Golconda</td>
<td>1</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>5-15</td>
<td>5-15</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>CRHY</td>
<td>5-15</td>
<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>PSEG</td>
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<td>2-5</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td>1-3</td>
<td>1-3</td>
</tr>
<tr>
<td>Thurber needlegrass</td>
<td>STTH2</td>
<td>---</td>
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</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>---</td>
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</tr>
<tr>
<td>Globemallow</td>
<td>SPAE</td>
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</tr>
<tr>
<td>Phlox</td>
<td>PHLOX</td>
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</tr>
<tr>
<td>Other perennial forbs</td>
<td>PFFF</td>
<td>2-8</td>
<td>2-8</td>
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<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>30-40</td>
<td>30-40</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>20-30</td>
<td>20-30</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>2-5</td>
<td>2-5</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULAS5</td>
<td>2-5</td>
<td>2-5</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
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Range site number

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<tbody>
<tr>
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<td>700</td>
</tr>
<tr>
<td>Normal years</td>
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<td>450</td>
</tr>
<tr>
<td>Unfavorable years</td>
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</tbody>
</table>
261--Golconda silt loam, 8 to 15 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
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<tbody>
<tr>
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<td>SIHY</td>
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<td>5-15</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
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<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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<td>2-5</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td></td>
<td>1-3</td>
</tr>
<tr>
<td>Thurber needlegrass</td>
<td>STTH2</td>
<td></td>
<td>---</td>
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<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td></td>
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</tr>
<tr>
<td>Globemallow</td>
<td>SPHAE</td>
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</tr>
<tr>
<td>Phlox</td>
<td>PHLOX</td>
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</tr>
<tr>
<td>Other perennial forbs</td>
<td>FFFF</td>
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<td>2-8</td>
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<tr>
<td>Shadscale</td>
<td>ATCO</td>
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<tr>
<td>Bud sagebrush</td>
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<td>Spiny hopsage</td>
<td>GRSP</td>
<td></td>
<td>2-5</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULAS5</td>
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<td>2-5</td>
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<tr>
<td>Wyoming big sagebrush</td>
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Range site number:

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Potential production (lb/acre):

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<th>O24X020N</th>
<th>O24X002N</th>
<th>O24X002N</th>
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<tbody>
<tr>
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</tr>
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<td>Unfavorable years</td>
<td>300</td>
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</table>
270--Goldrun fine sand, 4 to 15 percent slopes
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
<th>Plant symbol</th>
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</tr>
<tr>
<td>Needlethread</td>
<td>STCO4</td>
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<td>---</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td>2-10</td>
<td>5-20</td>
</tr>
<tr>
<td>Thickspike wheatgrass</td>
<td>AGDA</td>
<td>2-10</td>
<td>---</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
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<tr>
<td>Thurber needlegrass</td>
<td>STTH2</td>
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<tr>
<td>Sandberg bluegrass</td>
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<td>---</td>
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<tr>
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<td>5-15</td>
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<td>Rubber rabbitbrush</td>
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Range site number

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281--Golsum-Spinlin-Harcany association

(An X indicates that the named plant is in the potential native woodland understory and the percent is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>Mountain brome</td>
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<td>Cusick bluegrass</td>
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<td>Pine bluegrass</td>
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<td>150</td>
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<td>400</td>
<td>1,200</td>
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321--Humboldt silty clay loam, slightly saline-sodic

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
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<td>15-30</td>
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<td>50-60</td>
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<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>5-10</td>
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<td>SPAI</td>
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<td>---</td>
<td>15-30</td>
</tr>
<tr>
<td>Sierra clover</td>
<td>TRWO</td>
<td>2-5</td>
<td>---</td>
<td>2-5</td>
</tr>
<tr>
<td>Other perennial forbs</td>
<td>PFFF</td>
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<td>2-8</td>
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<tr>
<td>Willow</td>
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<tr>
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<td>2-5</td>
<td>15-20</td>
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<tr>
<td>Silver sagebrush</td>
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<td>Black greasewood</td>
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<td>Rubber rabbitbrush</td>
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<tr>
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<tr>
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322--Humboldt silty clay loam, strongly saline-sodic

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<td>Basin wildrye</td>
<td>ELCI2</td>
<td>Humboldt</td>
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<td>SPA1</td>
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<tr>
<td>Creeping wildrye</td>
<td>ELTR3</td>
<td>5-10</td>
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<td>PONE3</td>
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</tr>
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<td>MURI</td>
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</tr>
<tr>
<td>Sierra clover</td>
<td>TRWO</td>
<td>2-5</td>
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<tr>
<td>Other perennial forbs</td>
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<tr>
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<td>SAVE4</td>
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<td>CHAL9</td>
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<td>CHNA2</td>
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<tr>
<td>Willow</td>
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<td>5-10</td>
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<tr>
<td>Basin big sagebrush</td>
<td>ARTRT</td>
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Range site number

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<td>1,800</td>
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330--McConnel loam, 0 to 2 percent slopes

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<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-15</td>
<td>5-15</td>
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<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
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<td>2-10</td>
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<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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<td>2-10</td>
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<td>1-2</td>
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<tr>
<td>Globemallow</td>
<td>SPHAE</td>
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<td>1-2</td>
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<tr>
<td>Phlox</td>
<td>PHLOX</td>
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<tr>
<td>Wyoming big sagebrush</td>
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<tr>
<td>Spiny hopsage</td>
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<td>5-15</td>
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Range site number 024X020N  024X020N  024X020N

Potential production (lb/acre):

- Favorable years: 700  700  700
- Normal years: 450  450  450
- Unfavorable years: 300  300  300
### 331--McConnel gravelly fine sandy loam, 4 to 8 percent slopes

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number—</th>
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<tbody>
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<td>McConnel</td>
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<td>Indian ricegrass</td>
<td>ORHY</td>
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<td>McConnel</td>
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<td>STHY</td>
<td>2-10</td>
<td>McConnel</td>
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<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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<td>McConnel</td>
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<td>Tapertip hawksbeard</td>
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<td>McConnel</td>
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**Range site number**

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360--Needle Peak silt loam, slightly saline-sodic

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tr>
<td>Alkali sacaton</td>
<td>SPAI</td>
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<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>5-10</td>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
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<tr>
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<td>Other perennial grasses</td>
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<td>Perennial forbs</td>
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<tr>
<td>Basin big sagebrush</td>
<td>ARTRT</td>
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<tr>
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<tr>
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<tr>
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<td>SUAED</td>
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<tr>
<td>Spiny hopsage</td>
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Range site number

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Potential production (lb/acre):

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### 360--Ninch fine sand, 0 to 15 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Inclusion number--</th>
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<td>Needleandthread</td>
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<td>5-15</td>
<td>5-15</td>
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<tr>
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<td>ELCI2</td>
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<tr>
<td>Thickspike wheatgrass</td>
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<tr>
<td>Bottlebrush squirreltail</td>
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<tr>
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<tr>
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<td>THELY</td>
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<tr>
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<td>Rubber rabbitbrush</td>
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**Range site number**

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<tr>
<td>Unfavorable years</td>
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400--Orovada loam, 0 to 2 percent slopes
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<td>Needlethread</td>
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<td>CRAC2</td>
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<td>SPHA</td>
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<td>GRSP</td>
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<tr>
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<td>ATCO</td>
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<tr>
<td>Bud sagebrush</td>
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Range site number

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406--Orovada very fine sandy loam, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
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</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
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<tr>
<td>Globemallow</td>
<td>SPHAE</td>
<td>1-2</td>
<td>1-2</td>
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<tr>
<td>Phlox</td>
<td>PHLOX</td>
<td>1-2</td>
<td>1-2</td>
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</tr>
<tr>
<td>Thelypody</td>
<td>THELY</td>
<td>---</td>
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</tr>
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<td>Other perennial forbs</td>
<td>PFFFFFF</td>
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<td>GRSP</td>
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<tr>
<td>Basin big sagebrush</td>
<td>ARTKT</td>
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<td>15-20</td>
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<tr>
<td>Black greasewood</td>
<td>SAVB4</td>
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<tr>
<td>Rubber rabbitbrush</td>
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Range site number

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<td>300</td>
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<td>350</td>
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431--Preble silt loam, strongly saline-sodic

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<td>Indian ricegrass</td>
<td>ORMY</td>
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<td>2-5</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
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<td>Thickspike wheatgrass</td>
<td>AGDA</td>
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<td>Lemon scurfpea</td>
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<td>Alkali rabbitbrush</td>
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Range site number: O24X011N O24X022N O24X001N O24X007N

Potential production (lb/acre):
Favorable years: 500 800 800 1,900
Normal years: 350 600 500 1,400
Unfavorable years: 200 350 300 800
451--Pumper loam
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
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Range site number:

- **024X002N**
- **024X020N**

Potential production (lb/acre):

- Favorable years: 700, 700, 700, 700, 700
- Normal years: 450, 450, 450, 450, 450
- Unfavorable years: 300, 300, 300, 300, 300
470--Raglan silt loam
(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
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<tbody>
<tr>
<td>Potential production (lb/acre):</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Favorable years</td>
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<td>700</td>
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<tr>
<td>Normal years</td>
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<td>450</td>
<td>1,100</td>
<td>450</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>300</td>
<td>300</td>
<td>600</td>
<td>300</td>
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</tbody>
</table>
### 471--Raglan silt loam, moderately saline-sodic

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tr>
<td></td>
<td></td>
<td></td>
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<td>5-10</td>
<td>5-15</td>
<td>---</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>---</td>
<td>5-15</td>
<td>---</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>---</td>
<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Needleandthread</td>
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<td>1-3</td>
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<tr>
<td>Basin wildrye</td>
<td>ELC2</td>
<td>---</td>
<td>50-60</td>
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</tr>
<tr>
<td>Western wheatgrass</td>
<td>AGSM</td>
<td>---</td>
<td>5-15</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td>T-10</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
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<td>2-8</td>
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<tr>
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<tr>
<td>Black greasewood</td>
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<td>---</td>
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<td>Spiny hopsage</td>
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<td>Winterfat</td>
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<tr>
<td>Basin big sagebrush</td>
<td>ARTT</td>
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<td>2-5</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
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<th>024X002N</th>
<th>024X006N</th>
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<td>Potential production (lb/acre):</td>
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<tr>
<td>Favorable years</td>
<td>600</td>
<td>700</td>
<td>1,500</td>
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<tr>
<td>Normal years</td>
<td>450</td>
<td>450</td>
<td>1,100</td>
<td>450</td>
</tr>
<tr>
<td>Unfavorable years</td>
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<td>300</td>
</tr>
</tbody>
</table>
480--Rebel loam, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>Rebel</td>
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<tr>
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<td>10-20</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-15</td>
<td>5-15</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>2-10</td>
<td>2-10</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>2-10</td>
<td>2-10</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Western wheatgrass</td>
<td>AGSM</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CBAC2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Globemallow</td>
<td>SPHAE</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Phlox</td>
<td>PHLOX</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Other perennial forbs</td>
<td>PFFP</td>
<td>___</td>
<td>___</td>
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<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
<td>30-35</td>
<td>30-35</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>5-15</td>
<td>5-15</td>
</tr>
<tr>
<td>Basin big sagebrush</td>
<td>ARTTRT</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAV4</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
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<td>___</td>
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</tbody>
</table>

Range site number:
- 024X020N

Potential production (lb/acre):
- Favorable years: 700
- Normal years: 450
- Unfavorable years: 300
### 481--Rebel loam, 2 to 4 percent slopes

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Rebel</th>
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<tr>
<td>Bottlebrush squirreltail</td>
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<tr>
<td>Sandberg bluegrass</td>
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<td>2-10</td>
<td>2-10</td>
<td>2-10</td>
</tr>
<tr>
<td>Phlox</td>
<td>PHLOX</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Globemallow</td>
<td>SPHARE</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
<td>1-2</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
<td>30-35</td>
<td>30-35</td>
<td>30-35</td>
<td>30-35</td>
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<tr>
<td>Spiny hopsage</td>
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<tr>
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<tr>
<td>Unfavorable years</td>
<td>300</td>
<td>300</td>
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</table>
482--Rebel loam, rarely flooded, 0 to 2 percent slopes

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
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<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>Rebel</td>
<td>2-10</td>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>Rebel</td>
<td>2-5</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>Rebel</td>
<td>2-5</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td></td>
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</tr>
<tr>
<td>Basin big sagebrush</td>
<td>ARTRT</td>
<td></td>
<td>15-25</td>
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<td>Black greasewood</td>
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<td>Anderson peachbrush</td>
<td>FRAN2</td>
<td></td>
<td>2-10</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td></td>
<td>2-5</td>
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</tbody>
</table>

Range site number: 024X041N

Potential production (lb/acre):
- Favorable years: 1,000
- Normal years: 800
- Unfavorable years: 600
### 500--Focker silty clay loam

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Soil name</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI</td>
<td>Focker</td>
</tr>
<tr>
<td>Western wheatgrass</td>
<td>AGSM</td>
<td>5-15</td>
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<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>5-10</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
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</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td></td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td></td>
</tr>
<tr>
<td>Needleandthroat</td>
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<tr>
<td>Other perennial grasses</td>
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<tr>
<td>Perennial forbs</td>
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<td>ARTRT</td>
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</tr>
<tr>
<td>Black greasewood</td>
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<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
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<tr>
<td>Alkali rabbitbrush</td>
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<td>Shadscale</td>
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<td>Spiny hogsage</td>
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<td>800</td>
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<td>300</td>
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</table>
561—Sonoma silt loam, occasionally flooded, strongly saline-sodic

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
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<td>Alkali sacaton</td>
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<td>Creeping wildrye</td>
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<td>MURI</td>
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<td>Sierra clover</td>
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<td>Other perennial forbs</td>
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<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
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<tr>
<td>Silver sagebrush</td>
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Range site number

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<tr>
<td>Favorable years</td>
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<tr>
<td>Normal years</td>
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<tr>
<td>Unfavorable years</td>
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</table>
562--Sonoma silt loam, drained, strongly saline-sodic

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td>Soil name</td>
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<td>Sonoma</td>
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<td>5-10</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>---</td>
</tr>
<tr>
<td>Western wheatgrass</td>
<td>AGSM</td>
<td>---</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
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</tr>
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<td>Black greasewood</td>
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</tr>
<tr>
<td>Torrey quailbrush</td>
<td>ATTO</td>
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</tr>
<tr>
<td>Basin big sagebrush</td>
<td>ARTKT</td>
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<td>Rubber rabbitbrush</td>
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Range site number

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<th>O24X015N</th>
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<tr>
<td>Favorable years</td>
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</tr>
<tr>
<td>Normal years</td>
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<td>600</td>
<td>1,200</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>200</td>
<td>400</td>
<td>800</td>
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</table>
### 563--Sondea-Swingler-Isolea association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>Swingler</td>
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<tr>
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581--Sumine-Gosumi-Nomara association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Soil composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Inclusion number--</th>
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</table>
591 -- Trunk-Hoot association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
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<td>Other perennial forbs</td>
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Range site number

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Potential production (lb/acre):

Favorable years: 800 700 700 800 2,500 250
Normal years: 600 450 450 600 1,900 150
Unfavorable years: 400 300 300 400 1,200 75
### 592—Trunk-Pocan association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Inclusion number--</th>
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<td>Basin big sagebrush</td>
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<td>Rubber rabbitbrush</td>
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<tr>
<td>Other shrubs</td>
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Range site number

- O24X005N
- O24X005N
- O24X029N
- O24X021N
- None
- O25X003N

Potential production (lb/acre):

- **Favorable years:** 800 800 1,500 1,400 --- 2,500
- **Normal years:** 600 600 1,100 1,000 --- 1,900
- **Unfavorable years:** 400 400 800 700 --- 1,200
596--Trunk-Burrita association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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Range site number: O24X005N O24X005N O24X002N None

Potential production (lb/acre):
- Favorable years: 800 800 700 ---
- Normal years: 600 600 450 ---
- Unfavorable years: 400 400 300 ---
598--Trunk-Oxcorl Variant-Bojo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number

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<td>Normal years</td>
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<td>Unfavorable years</td>
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### 599--Trunk-Burrita-Rock outcrop association

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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**Range site number**

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**Potential production (lb/acre):**

- Favorable years: 800
- Normal years: 600
- Unfavorable years: 400
600--Valmy fine sandy loam, 0 to 2 percent slopes

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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Range site number: 024X022N 024X022N 024X002N

Potential production (lb/acre):
- Favorable years: 800 800 700
- Normal years: 600 600 450
- Unfavorable years: 350 350 300
610—Weso very fine sandy loam, 0 to 2 percent slopes

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<td>ARSP5</td>
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<td>GRSP</td>
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Range site number

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614--Weso silt loam, moderately saline-sodic, 0 to 2 percent slopes

(The letter "t" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
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<td>ORHY</td>
<td>---</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>---</td>
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<tr>
<td>Needleandthread</td>
<td>STCO4</td>
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<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
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<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
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<td>Spiny hopsage</td>
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Range site number

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<th>Potential production (lb/acre):</th>
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<td>UNFAVORABLE YEARS</td>
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615--Weso-Misad-Beoska association

(The letter "Tr" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tbody>
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</tr>
<tr>
<td>Sandberg bluegrass</td>
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<tr>
<td>Needleandthread</td>
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<tr>
<td>Thurber needlegrass</td>
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</tr>
<tr>
<td>Other perennial grasses</td>
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<td>---</td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>---</td>
</tr>
<tr>
<td>Globemallow</td>
<td>SPHAE</td>
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<tr>
<td>Phlox</td>
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<tr>
<td>Other perennial forbs</td>
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</tr>
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<td>Shadscale</td>
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<td>Winterfat</td>
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<tr>
<td>Seepweed</td>
<td>SUAES</td>
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</tr>
<tr>
<td>Wyoming big sagebrush</td>
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Range site number

| 024X002N | 024X002N | 024X002N | 024X003N | 024X002N | 024X020N | 024X002N |

Potential production (lb/acre):

Favorable years 700 700 700 600 700 700 700
Normal years 450 450 450 450 450 450 450
Unfavorable years 300 300 300 300 300 300 300
652—Burrita-Hoot-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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</tr>
<tr>
<td>Indian ricegrass</td>
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<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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<tr>
<td>Needleandthread</td>
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<tr>
<td>Balsamroot</td>
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<td>Other perennial forbs</td>
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<td>Winterfat</td>
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Range site number

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653--Burrita-Burnborough association

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number            | 024X028N | 024X021N | 024X005N | 024X028N | None | 025X003N

Potential production (lb/acre):
Favorable years               | 1,000    | 1,400    | 800      | 1,000    | ---  | 2,500 |
Normal years                   | 700      | 1,000    | 600      | 700      | ---  | 1,900 |
Unfavorable years              | 500      | 700      | 400      | 500      | ---  | 1,200 |
660—Oxcorel-Beoska-Whirlo association

(The letter "t" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number: 024X002N 024X002N 024X002N 024X020N 024X006N 024X003N 024X020N

Potential production (lb/acre):
- Favorable years: 700 700 700 700 1,500 600 700
- Normal years: 450 450 450 450 1,100 450 450
- Unfavorable years: 300 300 300 300 600 300 300
### 661—Oxcorel-Orovada association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>Soil name</td>
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<td>Indian ricegrass</td>
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<td>Sandberg bluegrass</td>
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<tr>
<td>Bud sagebrush</td>
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</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
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</tr>
<tr>
<td>Winterfat</td>
<td>EULA5</td>
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<tr>
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### 662--Oxcorel-Whirlo-Trocken Variant association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<td>STCO4</td>
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<td>STTH2</td>
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</tr>
<tr>
<td>Bluebunch wheatgrass</td>
<td>AGSP</td>
<td>---</td>
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<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>---</td>
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<tr>
<td>Globemallow</td>
<td>SPMAE</td>
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<tr>
<td>Phlox</td>
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<td>Balsamroot</td>
<td>BALSA</td>
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<tr>
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<tr>
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<tr>
<td>Downy rabbitbrush</td>
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<td>Other shrubs</td>
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**Range site number**

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**Potential production (lb/acre):**

- **Favorable years**: 700, 700, 700, 800, 800
- **Normal years**: 450, 450, 450, 600, 600
- **Unfavorable years**: 300, 300, 300, 400, 400
663--Oxorel-Weso-Beoska association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
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<th>Inclusion number--</th>
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<tr>
<td>Bluebunch wheatgrass</td>
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Range site number: 024X002N 024X002N 024X002N 024X006N 024X002N 024X005N 024X020N

Potential production (lb/acre):

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### 664--Oxorel-Golconda association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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666--Oxorel-Trocken Variant-Snapp association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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Range site number

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669—Oxcorel-Beoska association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
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Range site number

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670--Misad-Snapp-Oxcorel association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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Range site number

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<td>Normal years</td>
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673—Misad-Golconda-Tenabo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<tr>
<td>Sandberg bluegrass</td>
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<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
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<td>SPHAE</td>
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<td>Phlox</td>
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<td>Other perennial forbs</td>
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</tr>
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</tr>
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<td>GRSP</td>
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Potential production (lb/acre):

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675--Misad-Orovada-Snapp association

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
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Range site number

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676--Misad Variant-Dun Glen-Misad Variant, strongly sloping, association
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
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<td>Spiny hopsage</td>
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<tr>
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Range site number

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Potential production (lb/acre):

- Favorable years: 400, 500, 400, 700, 700
- Normal years: 300, 350, 300, 450, 450
- Unfavorable years: 200, 200, 200, 300, 300
680--Bojo-Trunk-Rock outcrop association
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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Range site number: 024X026N 024X005N None 024X005N 024X026N 024X002N 024X005N

Potential production (lb/acre):
- Favorable years: 400 800 --- 800 400 700 800
- Normal years: 300 600 --- 600 300 450 600
- Unfavorable years: 200 400 --- 400 200 300 400
683—Bojo, steep-Bojo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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</tr>
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<tr>
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<tr>
<td>Other shrubs</td>
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Range site number

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691--Chilper-Trooken-Jerval association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tbody>
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<td>Soil Name</td>
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<td>Perennial forbs</td>
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<td>Shadscale</td>
<td>ATCO</td>
<td>20-30</td>
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<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>10-20</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
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Range site number

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Potential production (lb/acre):

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### 701--Atlow-Wiskan association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
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<td></td>
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<td>Thurber needlegrass</td>
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<td>10-15</td>
<td>5-15</td>
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<tr>
<td>Bluegrass</td>
<td>POA++</td>
<td>2-10</td>
<td>2-10</td>
<td>X</td>
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<tr>
<td>Bluebunch wheatgrass</td>
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<td>10-20</td>
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<tr>
<td>Desert needlegrass</td>
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<td>---</td>
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<td>X</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
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<td>X</td>
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<td>Basin wildrye</td>
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<tr>
<td>Mat muhly</td>
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<tr>
<td>Sedge</td>
<td>CAREX</td>
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<tr>
<td>Other perennial grasses</td>
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<tr>
<td>Globemallow</td>
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<td>2-5</td>
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<td>---</td>
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<td>CRAC2</td>
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<td>Arrowleaf balsamroot</td>
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<td>Lupine</td>
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<tr>
<td>Other perennial forbs</td>
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<td>5-15</td>
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<tr>
<td>Black sagebrush</td>
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<td>25-35</td>
<td>15-30</td>
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<td>Ephedra</td>
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<td>Other shrubs</td>
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<tr>
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Range site number:

- 024X030N
- 024X031N
- 027X075N
- 024X042N
- 025X014N
- 025X003N

Potential production (lb/acre):

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703—Atlow, steep-Daick-Atlow association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<td>MTRJ</td>
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<td>Sedge</td>
<td>CAREX</td>
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<td>Bluebunch wheatgrass</td>
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<tr>
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Range site number:

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Potential production (lb/acre):

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704--Atlow, steep-Hoot-Atlow association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>Other perennial forbs</td>
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<td>Black sagebrush</td>
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<tr>
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Range site number

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750--Snapp-Oxcorel association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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</tr>
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<td>AGSP</td>
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</tr>
<tr>
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<td>SIHY</td>
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<tr>
<td>Indian ricegrass</td>
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<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
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<tr>
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<td>Other shrubs</td>
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Range site number

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<th>O24X002N</th>
<th>O24X020N</th>
<th>O24X006N</th>
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| Potential production (lb/acre):
  Favorable years: 800 700 700 1,500
  Normal years: 600 450 450 1,100
  Unfavorable years: 400 300 300 600 |
751—Snapp-Sodhouse association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tr>
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<td>1-2</td>
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<tr>
<td>Other perennial forbs</td>
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<tr>
<td>Wyoming big sagebrush</td>
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<td>30-35</td>
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Range site number:

- 024X005N
- 024X002N
- 024X020N

Potential production (lb/acre):

- Favorable years: 800
- Normal years: 600
- Unfavorable years: 400

Potential production (lb/acre): 700
752--Snapp-Orovada association
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<th>Inclusion number--</th>
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<td>Basin wildrye</td>
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<td>Phlox</td>
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<td>Other perennial forbs</td>
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<td>Basin big sagebrush</td>
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<tr>
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Potential production (lb/acre):
Favorable years
Normal years
Unfavorable years
812--Boton-Playas association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<th>Inclusion number--</th>
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<td>Bottlebrush squirreltail</td>
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Range site number          027X024N None 027X028N 027X024N 027X025N

Potential production (lb/acre):

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813--Batan-Wendane-Valmy association

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Soil name</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Inclusion number--</th>
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Range site number

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<td>600</td>
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</table>
### Soil Survey

**814--Batan silt loam, moderately saline-sodic**

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
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<tr>
<td>Other perennial grasses</td>
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<td>PFFF</td>
<td>2-8</td>
<td>2-8</td>
<td>2-8</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>30-50</td>
<td>---</td>
<td>30-50</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>15-30</td>
<td>2-10</td>
<td>15-30</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>5-15</td>
<td>---</td>
<td>5-15</td>
</tr>
<tr>
<td>Sheepweed</td>
<td>SUAESD</td>
<td>2-15</td>
<td>---</td>
<td>2-15</td>
</tr>
<tr>
<td>Basin big sagebrush</td>
<td>APTRT</td>
<td>15-20</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td>2-5</td>
<td>---</td>
<td>---</td>
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</tbody>
</table>

**Range site number**

<table>
<thead>
<tr>
<th>Range site number</th>
<th>024X003N</th>
<th>024X006N</th>
<th>024X003N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential production (lb/acre):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Favorable years</td>
<td>600</td>
<td>1,500</td>
<td>600</td>
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<tr>
<td>Normal years</td>
<td>450</td>
<td>1,100</td>
<td>450</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>300</td>
<td>600</td>
<td>300</td>
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</tbody>
</table>
823--Trocken-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Soil name</td>
</tr>
<tr>
<td>Bluegrass</td>
<td>POA++</td>
<td></td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td></td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td></td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td></td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
<td></td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td></td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td></td>
</tr>
<tr>
<td>Littleleaf horsebrush</td>
<td>TEGL</td>
<td></td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td></td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
<td></td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td></td>
</tr>
<tr>
<td>Burrobrush</td>
<td>HYMEN3</td>
<td></td>
</tr>
<tr>
<td>Fourwing saltbush</td>
<td>ATCA2</td>
<td></td>
</tr>
<tr>
<td>Other shrubs</td>
<td>SSSS</td>
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Range site number

<table>
<thead>
<tr>
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<th>027X030N</th>
<th>027X030N</th>
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<td>Potential production (lb/acre):</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Favorable years</td>
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<tr>
<td>Normal years</td>
<td>500</td>
<td>200</td>
<td>300</td>
<td>300</td>
<td>300</td>
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<tr>
<td>Unfavorable years</td>
<td>300</td>
<td>50</td>
<td>200</td>
<td>200</td>
<td>200</td>
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</tbody>
</table>
825--Trocken very gravelly very fine sandy loam, moderately saline-sodic, 2 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Soil name</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trocken</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-10</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>5-10</td>
</tr>
<tr>
<td>Inland saltgrass</td>
<td>DISP52</td>
<td>2-5</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELC12</td>
<td>---</td>
</tr>
<tr>
<td>Alkalai sacaton</td>
<td>SPA1</td>
<td>5-10</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PPPF</td>
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<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>20-40</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>5-20</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SVAED</td>
<td>5-15</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
<td>2-10</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>2-10</td>
</tr>
<tr>
<td>Torrey quailbush</td>
<td>ATTO</td>
<td>---</td>
</tr>
<tr>
<td>Fourwing saltbush</td>
<td>ATCA2</td>
<td>---</td>
</tr>
<tr>
<td>Littleleaf horsebrush</td>
<td>TEGL</td>
<td>---</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td>---</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>---</td>
</tr>
<tr>
<td>Burrobrush</td>
<td>HYMN3</td>
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Range site number

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<th>027X022N</th>
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<tbody>
<tr>
<td>Potential production (lb/acre):</td>
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<td></td>
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</tr>
<tr>
<td>Favorable years</td>
<td>600</td>
<td>1,500</td>
<td>400</td>
</tr>
<tr>
<td>Normal years</td>
<td>400</td>
<td>1,000</td>
<td>200</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>200</td>
<td>600</td>
<td>50</td>
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</table>
**826--Trocken-Ragtown association**

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Soil name</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-10</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>5-10</td>
</tr>
<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>2-5</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td>---</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
<td>3-7</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>20-40</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>5-20</td>
</tr>
<tr>
<td>Seepe weed</td>
<td>SUAED</td>
<td>5-15</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
<td>2-10</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>2-10</td>
</tr>
<tr>
<td>Other shrubs</td>
<td>SSSS</td>
<td>---</td>
</tr>
</tbody>
</table>

**Range site number**

<table>
<thead>
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<th>027X025N</th>
<th>027X025N</th>
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**Potential production (lb/acre):**

<table>
<thead>
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<th>Favorable years</th>
<th>Normal years</th>
<th>Unfavorable years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>600</td>
<td>400</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

---
827--Trocken gravelly very fine sandy loam, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Soil name</td>
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<tr>
<td></td>
<td></td>
<td>Trocken</td>
</tr>
<tr>
<td>Bluegrass</td>
<td>POA++</td>
<td>10-30</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>---</td>
</tr>
<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>FPPG</td>
<td>5-15</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
<td>2-5</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>20-30</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>10-20</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
<td>---</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>---</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
<td>---</td>
</tr>
<tr>
<td>Other shrubs</td>
<td>SSSS</td>
<td>5-10</td>
</tr>
</tbody>
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Range site number

<table>
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<th>027X028N</th>
<th>027X030N</th>
<th>027X025N</th>
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</thead>
<tbody>
<tr>
<td>Potential production (lb/acre):</td>
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<td></td>
</tr>
<tr>
<td>Favorable years</td>
<td>700</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Normal years</td>
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<td>200</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>300</td>
<td>200</td>
<td>50</td>
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</table>
831--Benin-Yobe-Wendane association

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Plant symbol</th>
<th>Benin (%)</th>
<th>Yobe (%)</th>
<th>Wendane (%)</th>
<th>Inclusion number--</th>
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<tbody>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>5-10</td>
<td>---</td>
<td>5-10</td>
<td>---</td>
</tr>
<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>---</td>
<td>5-10</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td>---</td>
<td>---</td>
<td>15-25</td>
<td>---</td>
</tr>
<tr>
<td>Alkali sacaton</td>
<td>SPAI</td>
<td>---</td>
<td>---</td>
<td>5-10</td>
<td>---</td>
</tr>
<tr>
<td>Bluegrass</td>
<td>POA++</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>10-30</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PFGG</td>
<td>T-10</td>
<td>5-15</td>
<td>---</td>
<td>5-15</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
<td>2-8</td>
<td>3-7</td>
<td>5-10</td>
<td>2-5</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>30-50</td>
<td>2-10</td>
<td>2-5</td>
<td>20-30</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>15-30</td>
<td>40-60</td>
<td>5-15</td>
<td>---</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSPS5</td>
<td>5-15</td>
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<td>10-20</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
<td>2-15</td>
<td>2-5</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Torrey quailbush</td>
<td>ATTO</td>
<td>---</td>
<td>---</td>
<td>50-60</td>
<td>---</td>
</tr>
<tr>
<td>Fourwing saltbush</td>
<td>ATCA2</td>
<td>---</td>
<td>---</td>
<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Other shrubs</td>
<td>SSSS</td>
<td>---</td>
<td>5-15</td>
<td>---</td>
<td>5-10</td>
</tr>
</tbody>
</table>

| Range site number          | 024X003N     | 027X025N   | 027X041N  | 027X028N   |

Potential production (lb/acre):
- Favorable years: 600, 400, 1,500, 700
- Normal years: 450, 200, 1,000, 500
- Unfavorable years: 300, 50, 600, 300
### 900—Roca-Wiskan-Reluctan association

(The letter "x" means trace. An X indicates that the named plant is in the potential native woodland undergrowth and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community.)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Soil name</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bluebunch wheatgrass</td>
<td>AGSP</td>
<td>40-60</td>
</tr>
<tr>
<td>Thurber needlegrass</td>
<td>STTH2</td>
<td>5-10</td>
</tr>
<tr>
<td>Bluegrass</td>
<td>POGA++</td>
<td>2-10</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td>2-5</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>---</td>
</tr>
<tr>
<td>Idaho fescue</td>
<td>FEID</td>
<td>---</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>---</td>
</tr>
<tr>
<td>Nevada bluegrass</td>
<td>PONE3</td>
<td>---</td>
</tr>
<tr>
<td>Webber ricegrass</td>
<td>STWE</td>
<td>---</td>
</tr>
<tr>
<td>Cusick bluegrass</td>
<td>POEU3</td>
<td>---</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POCE</td>
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<td>Pine bluegrass</td>
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<tr>
<td>Other perennial grasses</td>
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<td>---</td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>2-5</td>
</tr>
<tr>
<td>Arrowleaf balsamroot</td>
<td>BASA3</td>
<td>2-5</td>
</tr>
<tr>
<td>Goldenweed</td>
<td>HAPLO2</td>
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<td>Phlox</td>
<td>PHLOX</td>
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<td>Other perennial forbs</td>
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<tr>
<td>Wyoming big sagebrush</td>
<td>ARTW</td>
<td>5-10</td>
</tr>
<tr>
<td>Mountain big sagebrush</td>
<td>ARVA2</td>
<td>T-5</td>
</tr>
<tr>
<td>Black sagebrush</td>
<td>ARARN</td>
<td>---</td>
</tr>
<tr>
<td>Ephedra</td>
<td>EPHED</td>
<td>---</td>
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<tr>
<td>Basin big sagebrush</td>
<td>ARTTR</td>
<td>---</td>
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<tr>
<td>Low sagebrush</td>
<td>ARAB8</td>
<td>---</td>
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<tr>
<td>Other shrubs</td>
<td>SSSE</td>
<td>---</td>
</tr>
<tr>
<td>Utah juniper</td>
<td>JUOS</td>
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**Range site number**

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<th>O24X031N</th>
<th>O24X021N</th>
<th>O24X052N</th>
<th>O25X014N</th>
<th>None</th>
<th>O24X016N</th>
</tr>
</thead>
</table>

**Potential production (lb/acre):**

- **Favorable years**
  - 1,000
  - 700
  - 1,400
  - 500
  - 1,000
  - ---
  - 350

- **Normal years**
  - 700
  - 500
  - 1,000
  - 350
  - 800
  - ---
  - 250

- **Unfavorable years**
  - 500
  - 300
  - 700
  - 200
  - 600
  - ---
  - 150
901--Roca-Reluctan association

(The letter "++" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Roca</td>
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</tr>
<tr>
<td>Bluebunch wheatgrass</td>
<td>AGSP</td>
<td>40-60</td>
<td>20-30</td>
</tr>
<tr>
<td>Thruber needlegrass</td>
<td>STTH2</td>
<td>5-10</td>
<td>2-10</td>
</tr>
<tr>
<td>Bluegrass</td>
<td>POA++</td>
<td>2-10</td>
<td>---</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELGI2</td>
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<tr>
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<td>ARTBN</td>
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<td>5-15</td>
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<tr>
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<td>ARARN</td>
<td>---</td>
<td>---</td>
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<tr>
<td>Basin big sagebrush</td>
<td>ARTBN</td>
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<tr>
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<tr>
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<td>CMVT8</td>
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<tr>
<td>Other shrubs</td>
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Range site number | 024X028N | 024X021N | 024X016N | None | 025X014N | 024X027N

Potential production (lb/acre):

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<tr>
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902--Roca-Reluctan-Sumya association

(The letter "x" means trace. An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
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<tr>
<td>Other perennial forbs</td>
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<tr>
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<td>Low sagebrush</td>
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Range site number

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Potential production (lb/acre):

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<td>350</td>
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903—Roca-Burnborough-Rock outcrop association

(The letter "T" means trace. An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<th>Inclusion number--</th>
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<td>Other perennial forbs</td>
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<tr>
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<tr>
<td>Mountain big sagebrush</td>
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<td></td>
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<tr>
<td>Ephedra</td>
<td>EPHED</td>
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</tr>
<tr>
<td>Low sagebrush</td>
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<td>Douglas rabbitbrush</td>
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Range site number

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Potential production (lb/acre):

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905--Roca-Reluctan Variant association, steep
(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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Range site number

<table>
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<th>Potential production (lb/acre):</th>
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<td>Normal years</td>
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<td>Unfavorable years</td>
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906--Roca-Reluctan Variant association, very steep

(The letter "m" means trace. An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tbody>
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<td>Soil name</td>
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Range site number

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<th>024X021N</th>
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Potential production (lb/acre):  
Favorable years: 1,000 800 1,400 1,000 500 2,500  
Normal years: 700 600 1,000 700 350 1,900  
Unfavorable years: 500 400 700 500 200 1,200
911--Tenabo-Daick-Oxcorel association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Soil name</td>
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</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>5-15</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>2-5</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td>1-3</td>
</tr>
<tr>
<td>Desert needlegrass</td>
<td>STSF3</td>
<td>---</td>
</tr>
<tr>
<td>Thuer needlegrass</td>
<td>STTH2</td>
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<tr>
<td>Other perennial grasses</td>
<td>PPFG</td>
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<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>---</td>
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<tr>
<td>Globemallow</td>
<td>SPHAE</td>
<td>---</td>
</tr>
<tr>
<td>Phlox</td>
<td>Phlox</td>
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</tr>
<tr>
<td>Other perennial forbs</td>
<td>PFFP</td>
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</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>30-40</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSF5</td>
<td>20-30</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
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</tr>
<tr>
<td>Winterfat</td>
<td>EULA5</td>
<td>2-5</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
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</tr>
<tr>
<td>Nevada ephedra</td>
<td>EPNE</td>
<td>---</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
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<tr>
<td>Other shrubs</td>
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Range site number:

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Potential production (lb/acre):

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<th>Unfavorable years</th>
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<td>700</td>
<td>450</td>
<td>300</td>
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</table>
930--Babus-Benin-Wendane association

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>Bubus</td>
<td>Benin</td>
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<td>5-10</td>
<td>5-10</td>
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</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td>---</td>
<td>---</td>
<td>20-40</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>---</td>
<td>---</td>
<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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<td>---</td>
<td>2-5</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td>---</td>
<td>1-3</td>
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</tr>
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<td>Alkali sacaton</td>
<td>SPAI</td>
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<td>---</td>
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<td>MUAS</td>
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<td>Inland saltgrass</td>
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<tr>
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<tr>
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<tr>
<td>Other perennial grasses</td>
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<td>T-10</td>
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<td>Perennial forbs</td>
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</tr>
<tr>
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</tr>
<tr>
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<tr>
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<tr>
<td>Torrey quailbush</td>
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<td>Silver buffaloberry</td>
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<tr>
<td>Willow</td>
<td>SALIX</td>
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<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
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</tr>
<tr>
<td>Woods rose</td>
<td>ROWO</td>
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Range site number

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<th>024X015N</th>
<th>024X002N</th>
<th>024X003N</th>
<th>024X009N</th>
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</table>
| Potential production (lb/acre):
| Favorable years      | 600      | 600      | 1,500    | 700      | 600      | 1,500    |
| Normal years         | 450      | 450      | 1,200    | 450      | 450      | 1,000    |
| Unfavorable years    | 300      | 300      | 800      | 300      | 300      | 700      |
931--Bubus-Valmy association

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td>Soil name</td>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td></td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td></td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td></td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POGE</td>
<td></td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td></td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td>T-10</td>
</tr>
<tr>
<td>Thelypody</td>
<td>THELY</td>
<td></td>
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<tr>
<td>Perennial forbs</td>
<td>PFFP</td>
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</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td></td>
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<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td></td>
</tr>
<tr>
<td>Bud sagebrush</td>
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<td></td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
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</tr>
<tr>
<td>Basin big sagebrush</td>
<td>ARTI4</td>
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</tr>
<tr>
<td>Wyoming big sagebrush</td>
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Range site number

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<th>024X002N</th>
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<td>300</td>
<td>800</td>
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</tr>
<tr>
<td>Unfavorable years</td>
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</tbody>
</table>
932--Bubus very fine sandy loam, 0 to 2 percent slopes

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Bubus</th>
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</thead>
<tbody>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
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<td>2-10</td>
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</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
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<td>15-20</td>
<td>---</td>
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<tr>
<td>Indian ricegrass</td>
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<td>10-20</td>
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<tr>
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<td>Needleandthread</td>
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</tr>
<tr>
<td>Other perennial grasses</td>
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<td>Other shrubs</td>
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Range site number  O24X003N  O24X022N  O24X008N  O27X016N

Potential production (lb/acre):
Favorable years  600  800  800  300
Normal years  450  600  600  200
Unfavorable years  300  350  400  50
950--Puffer, very steep-Xine-Puffer association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Inclusion number--</th>
</tr>
</thead>
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<td>Xine</td>
<td>Puffer</td>
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<td>Thurber needlegrass</td>
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<td>2-10</td>
<td>10-15</td>
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<td>Bluegrass</td>
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<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
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<tr>
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<td>MURI</td>
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<tr>
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<td>2-5</td>
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<tr>
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<tr>
<td>Bud sagebrush</td>
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<td>Spiny hopsage</td>
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<td>---</td>
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</tr>
<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>Wyoming big sagebrush</td>
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<td>---</td>
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</tr>
<tr>
<td>Basin big sagebrush</td>
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</tr>
<tr>
<td>Rubber rabbitbrush</td>
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<tr>
<td>Other shrubs</td>
<td>SSSS</td>
<td>5-35</td>
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<tr>
<td>Utah juniper</td>
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Range site number

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<th>Potential production (lb/acre):</th>
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<th>02AX002N</th>
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953--Puffer-Bojo-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>Thurber needlegrass</td>
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<td>10-15</td>
<td>2-5</td>
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<tr>
<td>Bluegrass</td>
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<tr>
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<tr>
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<td>CREPI</td>
<td>---</td>
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<tr>
<td>Spiny hopsage</td>
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<td>Other shrubs</td>
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Range site number

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<th>None</th>
<th>024X026N</th>
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Potential production (lb/acre):

| Favorable years | 500 | 400 | 400 | 400 |
| Normal years    | 350 | 300 | 300 | 300 |
| Unfavorable years | 250 | 200 | 200 | 200 |
954--Puffer-Xine-Rock outcrop association

(An X indicated that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>Thurber needlegrass</td>
<td>STTH2</td>
<td>10-15</td>
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<td>Bluegrass</td>
<td>PAA+</td>
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<td>Idaho fescue</td>
<td>FEID</td>
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<td>20-40</td>
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<td>Bluebunch wheatgrass</td>
<td>AGSP</td>
<td>---</td>
<td>20-30</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td>---</td>
<td>2-15</td>
</tr>
<tr>
<td>Cusick bluegrass</td>
<td>PCUC3</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Desert needlegrass</td>
<td>STSP3</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td>5-20</td>
<td>---</td>
</tr>
<tr>
<td>Globemallow</td>
<td>SPHAE</td>
<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>---</td>
<td>1-5</td>
</tr>
<tr>
<td>Arrowleaf balsamroot</td>
<td>BASA3</td>
<td>---</td>
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<tr>
<td>Other perennial forbs</td>
<td>PFFF</td>
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</tr>
<tr>
<td>Black sagebrush</td>
<td>ARARN</td>
<td>25-35</td>
<td>---</td>
</tr>
<tr>
<td>Mountain big sagebrush</td>
<td>ARVA2</td>
<td>---</td>
<td>5-15</td>
</tr>
<tr>
<td>Ephedra</td>
<td>EPHED</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
<td>---</td>
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<tr>
<td>Other shrubs</td>
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<tr>
<td>Utah juniper</td>
<td>JUOS</td>
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Range site number

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Potential production (lb/acre):

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<th>Potential production (lb/acre)</th>
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<th>024X021N</th>
<th>None</th>
<th>024X042N</th>
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<tr>
<td>Normal years</td>
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<td>800</td>
<td>400</td>
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<tr>
<td>Unfavorable years</td>
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<td>700</td>
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<td>500</td>
<td>300</td>
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</table>
### 955--Puffer-Mulhop-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>ORHY</td>
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<tr>
<td>Thurber needlegrass</td>
<td>SYTH2</td>
<td>10-15 X</td>
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<tr>
<td>Bluegrass</td>
<td>POA++</td>
<td>2-10 X</td>
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<tr>
<td>Desert needlegrass</td>
<td>STSP3</td>
<td>X</td>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td></td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
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<td>MURI</td>
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<td>Sedge</td>
<td>CAREX</td>
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<td>Idaho fescue</td>
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<td>SPHAE</td>
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<td>LUPIN</td>
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<tr>
<td>Basin big sagebrush</td>
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<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
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<td>Other shrubs</td>
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<tr>
<td>Utah juniper</td>
<td>JUOS</td>
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**Range site number**: 024X03ON 027X075N None 025X003N 024X021N 024X03ON

**Potential production (lb/acre):**
- Favorable years: 500 500 --- 2,500 1,400 500
- Normal years: 350 400 --- 1,900 1,000 350
- Unfavorable years: 250 300 --- 1,200 700 250
956--Puffer-Linrose-Iver association
(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<td></td>
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<td>10-20</td>
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<tr>
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<tr>
<td>Utah juniper</td>
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Range site number

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<td>1,500</td>
<td>1,200</td>
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</table>
957--Puffer, very steep-Atlow-Puffer association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
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Range site number

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Potential production (lb/acre):

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960--Findout-Puffer-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number

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Potential production (lb/acre):

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980--Mazuma very fine sandy loam, 0 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<td>Perennial forbs</td>
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<tr>
<td>Shadscale</td>
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<td>Bud sagebrush</td>
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<tr>
<td>Torrey quailbush</td>
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<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
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<tr>
<td>Fourwing saltbush</td>
<td>ATCA2</td>
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<td>Other shrubs</td>
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Range site number

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981—Mazuma fine sandy loam, strongly saline-sodic, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number

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Potential production (lb/acre):

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983—Mazuma-Swingler-Trocken association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number                  | 027X024N     | 027X024N | 027X028N | 027X022N | 027X009N |

Potential production (lb/acre):

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### 984--Mazuma-Bluewing-Woolsey association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number

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Potential production (lb/acre):

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### 985--Mazuma-Toulon-Chumall association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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986--Mazuma-Trocken association
(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number

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987--Mazuma-Yiper association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number | O27X028N | O27X024N | None | O27X022N | O27X009N | O27X014N
--- | --- | --- | --- | --- | --- | --- |
Potential production (lb/acre):
Favorable years | 700 | 600 | --- | 400 | 800 | 600 |
Normal years | 500 | 400 | --- | 200 | 450 | 400 |
Unfavorable years | 300 | 200 | --- | 50 | 200 | 200 |
968--Mazuma very fine sandy loam, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number

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990--Argenta very fine sandy loam, 0 to 2 percent slopes

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number

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Potential production (lb/acre):

- Favorable years: 1,900
- Normal years: 1,400
- Unfavorable years: 800
1020--Wholan very fine sandy loam, rarely flooded, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
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Range site number

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</tr>
<tr>
<td>Unfavorable years</td>
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1030--Wendane-Yobe association

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<tr>
<td>Bottlebrush squirreltail</td>
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<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>---</td>
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<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
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<tr>
<td>Other perennial grasses</td>
<td>PFGG</td>
<td>---</td>
<td>T-10</td>
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<td>Perennial forbs</td>
<td>PFFF</td>
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<td>ATCO</td>
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Range site number

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### 1070—Hoot-Burrita-Bojo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<th>Inclusion number--</th>
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<tr>
<td>Webber ricegrass</td>
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<tr>
<td>Desert needlegrass</td>
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<td>Mat muhly</td>
<td>MURI</td>
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<td>Sedge</td>
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<td>Balsamroot</td>
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</table>
1071--Hoot-Wiskan-Atlow association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-15</td>
<td>2-10</td>
<td>10-15</td>
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<tr>
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<td>POSE</td>
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<tr>
<td>Mat muhy</td>
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<tr>
<td>Sedge</td>
<td>CAREX</td>
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<tr>
<td>Other perennial grasses</td>
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<td>30-40</td>
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<tr>
<td>Bud sagebrush</td>
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<td>Spiny hopsage</td>
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Range site number

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- 024X031N
- 024X030N
- None
- 024X021N
- 027X075N
- 025X003N

Potential production (lb/acre):

- Favorable years:
  - 700
  - 500
  - 350
  - 700

- Normal years:
  - 450
  - 500
  - 350
  - 700

- Unfavorable years:
  - 300
  - 300
  - 250
  - 300
1073--Hoot, steep-Bojo-Hoot association
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<td>ORHY</td>
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<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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<tr>
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<td>Mat muhy</td>
<td>NURI</td>
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</tr>
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<td>Other perennial forbs</td>
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Range site number

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Potential production (lb/acre):
- Favorable years: 700
- Normal years: 450
- Unfavorable years: 300
1090--Bojo Variant-Schamp-Trunk association
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<td>Other shrubs</td>
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Range site number

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<th>024X030N</th>
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Potential production (lb/acre):

- Favorable years
  - 400
  - 800
  - 800
  - 2,500
  - 500

- Normal years
  - 300
  - 600
  - 600
  - 1,900
  - 350

- Unfavorable years
  - 200
  - 400
  - 400
  - 1,200
  - 250
Yipor silt loam, sandy substratum

(The letter "$m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
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<td>ORHY</td>
<td>---</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>---</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td>---</td>
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<tr>
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<td>---</td>
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Range site number

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</table>
1112--Yipor silt loam

(The letter "p" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tr>
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<td>Sandberg bluegrass</td>
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</tr>
<tr>
<td>Needleandthread</td>
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<td>Other perennial grasses</td>
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<td>Perennial forbs</td>
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<tr>
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<td>20-30</td>
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<td>Seepweed</td>
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<td>Winterfat</td>
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Range site number: 024X003N

Potential production (lb/acre):

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<tr>
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1113--Yipor-Badland association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
<td>Other perennial grasses</td>
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<tr>
<td>Shadscale</td>
<td>ATCO</td>
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<tr>
<td>Sheepweed</td>
<td>SUAED</td>
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</tr>
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<tr>
<td>Basin big sagebrush</td>
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Range site number

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1/14--Yipor silt loam, occasionally flooded

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
<td>Spiny hopsage</td>
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Range site number

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<tr>
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1121--Genegraf-Chilper-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>Indian ricegrass</td>
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Range site number 027X030N 027X028N 027X030N 027X030N 027X024N 027X022N

Potential production (lb/acre):

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<th></th>
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<th>Unfavorable years</th>
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### 1122—Genegraf-Trocken-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>ATCO</td>
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<td>Bailey greasewood</td>
<td>SAVEB</td>
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<td>ARSP5</td>
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</tr>
<tr>
<td>Littleleaf horsebrush</td>
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</tr>
<tr>
<td>Rubber rabbitbrush</td>
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<td>Spiny hopsage</td>
<td>GRSP</td>
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<tr>
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### Range site number

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1130--Cleaver-Trocken-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<td>---</td>
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<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
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</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
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</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
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<td>Littleleaf horsebrush</td>
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<td>Rubber rabbitbrush</td>
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<tr>
<td>Bailey greasewood</td>
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<td>---</td>
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<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
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<tr>
<td>Burrobrush</td>
<td>HYMEN3</td>
<td>---</td>
</tr>
<tr>
<td>Fourwing saltbush</td>
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Range site number
027X028N     027X028N     027X022N     027X030N     027X028N     027X028N

Potential production (lb/acre):

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1140--Layview, very steep-Tusel-Layview association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
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<td>Bluebunch wheatgrass</td>
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<td>Thurbere needlegrass</td>
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<td>Spike fescue</td>
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<td>Slender wheatgrass</td>
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<td>Bulbous oniongrass</td>
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<td>Nevada bluegrass</td>
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<td>Webber ricegrass</td>
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<td>Cusick bluegrass</td>
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<td>Sandberg bluegrass</td>
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<tr>
<td>Pine bluegrass</td>
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<tr>
<td>Sedge</td>
<td>CAREX</td>
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<td>Letterman needlegrass</td>
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<td>Columbia needlegrass</td>
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<td>Balsamroot</td>
<td>BALSA</td>
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<td>Geranium</td>
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<td>Tallcup lupine</td>
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</table>
1160--Slaw-Ragtown association
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Inclusion number--</th>
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<td>Alkali sacaton</td>
<td>SPAI</td>
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<td>SIHY</td>
<td>5-10</td>
<td>---</td>
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<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
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<tr>
<td>Other perennial grasses</td>
<td>FPFF</td>
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<td>5-15</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>FPFF</td>
<td>5-10</td>
<td>3-7</td>
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<tr>
<td>Torrey quailbush</td>
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<tr>
<td>Black greasewood</td>
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<tr>
<td>Fourwing saltbush</td>
<td>ATCA2</td>
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<td>---</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>2-5</td>
<td>2-10</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUEX</td>
<td>2-5</td>
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<tr>
<td>Other shrubs</td>
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Range site number: 027X041N 027X025N 027X025N 027X041N

Potential production (lb/acre):

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**1200--Bluewing, moderately steep-Bluewing-Daick association**

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tbody>
<tr>
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<tr>
<td>Indian ricegrass</td>
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<td>Bottlebrush squirreltail</td>
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</tr>
<tr>
<td>Desert needlegrass</td>
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<tr>
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<td>Inland saltgrass</td>
<td>DISPS2</td>
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<tr>
<td>Other perennial grasses</td>
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<td>Perennial forbs</td>
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<td>Bailey greasewood</td>
<td>SAVEB</td>
<td>5-30</td>
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<tr>
<td>Bud sagebrush</td>
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<td>Nevada ephedra</td>
<td>EPNE</td>
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<td>Spiny hopsage</td>
<td>GRSP</td>
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Range site number:

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Potential production (lb/acre):

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<td>50</td>
<td>100</td>
<td>300</td>
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1201--Bluewing gravelly sandy loam, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Inclusion number--</th>
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<tbody>
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<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
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<tr>
<td>Bluegrass</td>
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<td>5-10</td>
</tr>
<tr>
<td>Inland saltgrass</td>
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<tr>
<td>Other perennial grasses</td>
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<td>5-15</td>
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<tr>
<td>Perennial forbs</td>
<td>FFFF</td>
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<td>2-5</td>
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<tr>
<td>Shadscale</td>
<td>ATCO</td>
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<td>20-30</td>
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<tr>
<td>Bailey greasewood</td>
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<td>2-10</td>
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<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
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<tr>
<td>Black greasewood</td>
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<tr>
<td>Seepweed</td>
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<tr>
<td>Other shrubs</td>
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<td>5-10</td>
<td>5-15</td>
</tr>
</tbody>
</table>

Potential production (lb/acre):
- Favorable years: 500, 700, 400
- Normal years: 300, 500, 200
- Unfavorable years: 100, 300, 50
1210—Daick-Rezave-Rubble land association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<th>Inclusion number--</th>
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<tr>
<td>Desert needlegrass</td>
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<td>2-10</td>
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</tr>
<tr>
<td>Bluegrass</td>
<td>POA++</td>
<td>---</td>
<td>10-30</td>
<td>---</td>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>STHY</td>
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<td>2-10</td>
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<tr>
<td>Other perennial grasses</td>
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<td>Rubber rabbitbrush</td>
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<tr>
<td>Spiny hopsage</td>
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<td>Burrobrush</td>
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<td>Fourwing saltbush</td>
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Range site number: 027X027N  027X030N  None  027X030N  027X030N  027X022N

Potential production (lb/acre):
- Favorable years: 200  400  ---  400  400  400
- Normal years: 100  300  ---  300  300  200
- Unfavorable years: 50  200  ---  200  200  50
### 1230—Knott-Sodhouse-Wholan association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tr>
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<td>AGSP</td>
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<td>BALSA</td>
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<tr>
<td>Other shrubs</td>
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1231--Knott-Sodhouse-Cortez association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<td>2-5</td>
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<td>STTH2</td>
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<tr>
<td>Bluebunch wheatgrass</td>
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<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
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<td>Western wheatgrass</td>
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<tr>
<td>Balsamroot</td>
<td>BLSA</td>
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<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Globemallow</td>
<td>SPHAE</td>
<td>---</td>
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<tr>
<td>Phlox</td>
<td>PHLOX</td>
<td>---</td>
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<tr>
<td>Other perennial forbs</td>
<td>PFFF</td>
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<td>2-8</td>
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<tr>
<td>Shadscale</td>
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<td>Bud sagebrush</td>
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<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
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<td>2-5</td>
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<td>Winterfat</td>
<td>EUL5</td>
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<tr>
<td>Wyoming big sagebrush</td>
<td>ARTRW</td>
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<tr>
<td>Downy rabbitbrush</td>
<td>CHVIP</td>
<td>---</td>
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<tr>
<td>Basin big sagebrush</td>
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<td>Other shrubs</td>
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Range site number
024X002N  024X002N  024X005N  024X020N  024X006N  024X002N

Potential production (lb/acre):

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<th>024X005N</th>
<th>024X020N</th>
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1232--Knott, moderately steep-Snapp-Knott association
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td></td>
<td></td>
<td></td>
<td>moderately</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>steep</td>
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<td>5-15</td>
<td>5-15</td>
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<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-15</td>
<td>5-15</td>
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<td>Sandberg bluegrass</td>
<td>POSE</td>
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<td>2-5</td>
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<tr>
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<tr>
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<tr>
<td>Downy rabbitbrush</td>
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<tr>
<td>Other shrubs</td>
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</table>
**1270--Gol-Say association**

(The letter "m" means trace. An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>Ephedra</td>
<td>EPHED</td>
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<tr>
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<tr>
<td>Unfavorable years</td>
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<td>150</td>
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1271--Gol-Say-Rock outcrop association, steep

(The letter "m" means trace. An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community.)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tbody>
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<td>Say</td>
<td>Rock outcrop</td>
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<td>Other perennial forbs</td>
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<td>Other shrubs</td>
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<tr>
<td>Utah juniper</td>
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Range site number

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1272--Gol-Say-Rock outcrop association, very steep

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<tr>
<td>Thurber needlegrass</td>
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<tr>
<td>Basin wildrye</td>
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<tr>
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<td>---</td>
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<tr>
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<td>MURI</td>
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<tr>
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<td>CAREX</td>
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<td>Other shrubs</td>
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Range site number: 027X017N  027X058N  None  024X052N  027X017N  025X003N

Potential production (lb/acre):

- Favorable years: 400  1,200  ---  500  400  2,500
- Normal years: 200  1,000  ---  350  200  1,900
- Unfavorable years: 100  800  ---  200  100  1,200
### 1280--Gwena-Enko-Frewa association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>1-2</td>
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<td>Balsamroot</td>
<td>BALSA</td>
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<td>GRSP</td>
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<tr>
<td>Other shrubs</td>
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**Range site number**: 024X020N 024X020N 024X020N 024X005N 024X020N 024X020N

**Potential production (lb/acre):**

- **Favorable years**: 700 700 700 800 700 700
- **Normal years**: 450 450 450 600 450 450
- **Unfavorable years**: 300 300 300 400 300 300
1290--Slaven-Linrose-Iver association
(The letter "t" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
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<tr>
<td>Bottlebrush squirreltail</td>
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<td>Idaho fescue</td>
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<tr>
<td>Cusick bluegrass</td>
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<tr>
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<tr>
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Range site number

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</table>
1291--Slaven-Iver-Cleavage association

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
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</tr>
<tr>
<td>Black sagebrush</td>
<td>ARARN</td>
<td>---</td>
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</tr>
<tr>
<td>Other shrubs</td>
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Range site number

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<td>1,200</td>
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<td>1,200</td>
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1292--Slaven-Iver-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td>Soil name</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
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<td>ELCI2</td>
<td>5-10</td>
</tr>
<tr>
<td>Mountain brome</td>
<td>BRCA5</td>
<td>2-15</td>
</tr>
<tr>
<td>Thuber needlegrass</td>
<td>STTH2</td>
<td>2-5</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>2-5</td>
</tr>
<tr>
<td>Idaho fescue</td>
<td>FEID</td>
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</tr>
<tr>
<td>Cusick bluegrass</td>
<td>POCU3</td>
<td>2-5</td>
</tr>
<tr>
<td>Sedge</td>
<td>CAREX</td>
<td>2-5</td>
</tr>
<tr>
<td>Webber ricegrass</td>
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<td>1-2</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
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<tr>
<td>Pine bluegrass</td>
<td>FOSC</td>
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<tr>
<td>Slender wheatgrass</td>
<td>AGTR</td>
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<tr>
<td>Spike fescue</td>
<td>LEK12</td>
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</tr>
<tr>
<td>Bulbous oniongrass</td>
<td>MEBU</td>
<td>2-5</td>
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<tr>
<td>Nevada bluegrass</td>
<td>PONE3</td>
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</tr>
<tr>
<td>Bluegrass</td>
<td>POA++</td>
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<tr>
<td>Other perennial grasses</td>
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<tr>
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<td>CRAC2</td>
<td>2-5</td>
</tr>
<tr>
<td>Arrowleaf balsamroot</td>
<td>BASA3</td>
<td>2-5</td>
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<tr>
<td>Lupine</td>
<td>LUPIN</td>
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<td>Geranium</td>
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<td>Groundsel</td>
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<td>Meadowrue</td>
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<td>Other perennial forbs</td>
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<tr>
<td>Mountain big sagebrush</td>
<td>ARVA2</td>
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<tr>
<td>Snowberry</td>
<td>SYMPH</td>
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<tr>
<td>Low sagebrush</td>
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<tr>
<td>Black sagebrush</td>
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<tr>
<td>Serviceberry</td>
<td>AMELA</td>
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<td>Other shrubs</td>
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<tr>
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Range site number 024X029N 024X023N None 024X016N 024X032N 025X065N

Potential production (lb/acre):

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<tr>
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### 1320---Alyan-Chen-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alyan</td>
<td>Chen</td>
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<td>25-50</td>
<td>20-40</td>
</tr>
<tr>
<td>Bluebunch wheatgrass</td>
<td>AGSP</td>
<td>20-30</td>
<td>15-30</td>
<td>20-30</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
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<td>---</td>
<td>2-15</td>
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<tr>
<td>Thrubner needlegrass</td>
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<td>2-10</td>
<td>2-10</td>
</tr>
<tr>
<td>Spike fescue</td>
<td>LEKI2</td>
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<td>2-10</td>
<td>---</td>
</tr>
<tr>
<td>Letterman needlegrass</td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Columbia needlegrass</td>
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<tr>
<td>Cusick bluegrass</td>
<td>POCU3</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Sedge</td>
<td>CAREX</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Nevada bluegrass</td>
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<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Mat muhly</td>
<td>MURI</td>
<td>---</td>
<td>---</td>
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</tr>
<tr>
<td>Tepertip hawksbeard</td>
<td>CRAC2</td>
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<td>---</td>
<td>1-5</td>
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<tr>
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<td>BASA3</td>
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<td>Balsamroot</td>
<td>Balsa</td>
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<tr>
<td>Mountain big sagebrush</td>
<td>ARVA2</td>
<td>5-15</td>
<td>---</td>
<td>5-15</td>
</tr>
<tr>
<td>Low sagebrush</td>
<td>ARAR8</td>
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<td>10-20</td>
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<tr>
<td>Douglas rabbitbrush</td>
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<tr>
<td>Three tip sagebrush</td>
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<td>Rabbitbrush</td>
<td>CHRYS9</td>
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<tr>
<td>Basin big sagebrush</td>
<td>ARTK7</td>
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<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
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<tr>
<td>Other shrubs</td>
<td>SSSS</td>
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<th>024X021N</th>
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### Potential production (lb/acre):

- **Favorable years**: 1,400 1,200 --- 1,400 1,100 2,500
- **Normal years**: 1,000 800 --- 1,000 900 1,900
- **Unfavorable years**: 700 600 --- 700 600 1,200
**1321--Alyan-Slaven association**

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<thead>
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<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<td>Soil name</td>
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<td>Idaho fescue</td>
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<td>Bluebunch wheatgrass</td>
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<tr>
<td>Basin wildrye</td>
<td>ELCL2</td>
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</tr>
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<td>Mountain brome</td>
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</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>---</td>
</tr>
<tr>
<td>Nevada bluegrass</td>
<td>PONE3</td>
<td>---</td>
</tr>
<tr>
<td>Mat muly</td>
<td>MURI</td>
<td>---</td>
</tr>
<tr>
<td>Sedge</td>
<td>CAREX</td>
<td>---</td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>1-5</td>
</tr>
<tr>
<td>Arrowleaf balsamroot</td>
<td>BASA3</td>
<td>1-5</td>
</tr>
<tr>
<td>Mountain big sagebrush</td>
<td>ARVA2</td>
<td>5-15</td>
</tr>
<tr>
<td>Basin big sagebrush</td>
<td>ARTPR</td>
<td>---</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHHA2</td>
<td>---</td>
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<tr>
<td>Other shrubs</td>
<td>SSSS</td>
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<th>024X029N</th>
<th>024X021N</th>
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<tr>
<td>Unfavorable years</td>
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### 1340--Laped-Colbar association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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</thead>
<tbody>
<tr>
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<td>Soil name</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>5-15</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>CRHY</td>
<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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<tr>
<td>Needleleandthread</td>
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<td>AGSP</td>
<td>5-10</td>
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<tr>
<td>Webber ricegrass</td>
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</tr>
<tr>
<td>Desert needlegrass</td>
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<td>Pine bluegrass</td>
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<tr>
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<td>BALSA</td>
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<td>CRAC2</td>
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<td>Eriogonum</td>
<td>ER10G</td>
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<tr>
<td>Hawksbeard</td>
<td>CREPI</td>
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<tr>
<td>Other perennial forbs</td>
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</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>30-40</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>20-30</td>
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<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
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<tr>
<td>Winterfat</td>
<td>EULAS</td>
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<tr>
<td>Wyoming big sagebrush</td>
<td>AKTEH</td>
<td>15-20</td>
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<tr>
<td>Downy rabbitbrush</td>
<td>CHYIP</td>
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<td>Other shrubs</td>
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Potential production (lb/acre):

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<tbody>
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<tr>
<td>Unfavorable years</td>
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1350—Burnborough-Cleavage-Reluctan association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
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<th>Cleavage</th>
<th>Reluctan</th>
<th>Inclusion number--</th>
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<td>3</td>
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<td>15-30</td>
<td>20-30</td>
<td>X</td>
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<tr>
<td>Basin wildrye</td>
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<td>2-15</td>
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</tr>
<tr>
<td>Thurber needlegrass</td>
<td>STTH2</td>
<td>2-10</td>
<td>2-10</td>
<td>2-10</td>
<td>---</td>
</tr>
<tr>
<td>Spike fescue</td>
<td>LEK12</td>
<td>---</td>
<td>2-10</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>---</td>
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<td>X</td>
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</tr>
<tr>
<td>Bluegrass</td>
<td>POK++</td>
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<td>---</td>
<td>X</td>
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</tr>
<tr>
<td>Cusick bluegrass</td>
<td>POCU3</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Mountain brome</td>
<td>BRCA5</td>
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<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Sedge</td>
<td>CAREX</td>
<td>---</td>
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</tr>
<tr>
<td>Tufted hairgrass</td>
<td>DECAS</td>
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<td>30-60</td>
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</tr>
<tr>
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Range site number

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1360--Kram-Hopeka-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number

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Potential production (lb/acre):

Favorable years: 400, 400
Normal years: 275, 275
Unfavorable years: 150, 150
1390--Mulhop-Xine-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
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Range site number

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1410--Yobe-Bezo-Yobe, occasionally flooded, association
(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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Range site number: 024X015N 027X044N 024X011N 024X022N 027X041N 027X036N

Potential production (lb/acre):
- Favorable years: 1,500 600 500 800 1,500 200
- Normal years: 1,200 400 350 600 1,000 100
- Unfavorable years: 800 200 200 350 600 50
1411—Yobe-Sonoma association

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Soil name</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yobe</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELC12</td>
<td>20-40</td>
</tr>
<tr>
<td>Alkali sacaton</td>
<td>SPAI</td>
<td>---</td>
</tr>
<tr>
<td>Alkali muhly</td>
<td>MUAS</td>
<td>---</td>
</tr>
<tr>
<td>Alkali bluegrass</td>
<td>POJU</td>
<td>---</td>
</tr>
<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>---</td>
</tr>
<tr>
<td>Alkali cordgrass</td>
<td>SPGR</td>
<td>---</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIMY</td>
<td>---</td>
</tr>
<tr>
<td>Arrowgrass</td>
<td>TRIGL</td>
<td>1-3</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PFGG</td>
<td>---</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFF</td>
<td>2-8</td>
</tr>
<tr>
<td>Torrey quailbush</td>
<td>ATTO</td>
<td>30-50</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>5-15</td>
</tr>
<tr>
<td>Basin big sagebrush</td>
<td>ARTRT</td>
<td>2-10</td>
</tr>
<tr>
<td>Silver buffaloberry</td>
<td>SHAR</td>
<td>---</td>
</tr>
<tr>
<td>Willow</td>
<td>SALIX</td>
<td>---</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td>---</td>
</tr>
<tr>
<td>Woods rose</td>
<td>ROWO</td>
<td>---</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>---</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>---</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
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Range site number

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<tr>
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<th>024X015N</th>
<th>024X009N</th>
<th>024X003N</th>
<th>024X003N</th>
<th>024X011N</th>
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<td>Potential production (lb/acre):</td>
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<tr>
<td>Favorable years</td>
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<td>1,500</td>
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<td>600</td>
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<tr>
<td>Normal years</td>
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<td>450</td>
<td>350</td>
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<tr>
<td>Unfavorable years</td>
<td>800</td>
<td>700</td>
<td>300</td>
<td>300</td>
<td>200</td>
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</table>
### 1412--Yobe silt loam, occasionally flooded

(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
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<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>Basin wildrye</td>
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<td>Yobe</td>
<td>5-15</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>Yobe</td>
<td>5-10</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>Yobe</td>
<td>---</td>
<td>5-10</td>
<td>5-15</td>
<td>5-15</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>Yobe</td>
<td>---</td>
<td>---</td>
<td>5-15</td>
<td>5-15</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>Yobe</td>
<td>---</td>
<td>---</td>
<td>2-5</td>
<td>2-5</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td>Yobe</td>
<td>---</td>
<td>---</td>
<td>1-3</td>
<td>1-3</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td>Yobe</td>
<td>---</td>
<td>T-10</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
<td>Yobe</td>
<td>T-5</td>
<td>2-8</td>
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<tr>
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<td>60-75</td>
<td>15-30</td>
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<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>Yobe</td>
<td>---</td>
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<td>30-40</td>
<td>30-40</td>
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<tr>
<td>Bud sagebrush</td>
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<td>Yobe</td>
<td>---</td>
<td>5-15</td>
<td>20-30</td>
<td>20-30</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAED</td>
<td>Yobe</td>
<td>---</td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>Yobe</td>
<td>---</td>
<td>2-5</td>
<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULAS</td>
<td>Yobe</td>
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<td>2-5</td>
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</tr>
</tbody>
</table>

**Range site number**: 024X011N, 024X003N, 024X002N, 024X002N, 024X011N

**Potential production (lb/acre)**:

- **Favorable years**: 500, 600, 700, 700, 500
- **Normal years**: 350, 450, 450, 450, 350
- **Unfavorable years**: 200, 300, 300, 300, 200
1420--Goldrun Variant sandy loam, 4 to 15 percent slopes
(The letter "T" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Goldrun</td>
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<tr>
<td></td>
<td></td>
<td>Variant</td>
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<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>5-10</td>
<td>---</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>2-5</td>
<td>2-5</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td>5-15</td>
<td>T-5</td>
</tr>
<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>5-10</td>
<td>T-15</td>
</tr>
<tr>
<td>Alkali sacaton</td>
<td>SPAI</td>
<td>2-5</td>
<td>40-70</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PPF</td>
<td>5-10</td>
<td>2-5</td>
</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>30-40</td>
<td>5-15</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>10-20</td>
<td>---</td>
</tr>
<tr>
<td>Cooper wolfberry</td>
<td>LYCO2</td>
<td>5-15</td>
<td>---</td>
</tr>
<tr>
<td>Torrey quailbush</td>
<td>ATTO</td>
<td>---</td>
<td>50-70</td>
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<tr>
<td>Seepweed</td>
<td>SUAR4</td>
<td>---</td>
<td>2-5</td>
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<tr>
<td>Iodinebush</td>
<td>ALOC2</td>
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</tr>
<tr>
<td>Sickle saltbush</td>
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Range site number

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<th>027X044N</th>
<th>024X01ON</th>
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<tr>
<td>Favorable years</td>
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<td>600</td>
<td>450</td>
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<tr>
<td>Normal years</td>
<td>100</td>
<td>400</td>
<td>300</td>
</tr>
<tr>
<td>Unfavorable years</td>
<td>50</td>
<td>200</td>
<td>150</td>
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</tbody>
</table>
1430--Yobe Variant silty clay

(The letter "m" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
</tr>
</thead>
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<td></td>
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<tr>
<td>Inland saltgrass</td>
<td>DISPS2</td>
<td>T-15</td>
<td>5-10</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td>T-5</td>
<td>5-15</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>---</td>
<td>2-5</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Perennial forbs</td>
<td>PFFF</td>
<td>2-8</td>
<td>2-5</td>
</tr>
<tr>
<td>Iodinebush</td>
<td>ALOC2</td>
<td>10-20</td>
<td>2-5</td>
</tr>
<tr>
<td>Sickle saltbush</td>
<td>ATFA</td>
<td>5-10</td>
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</tr>
<tr>
<td>Black greasewood</td>
<td>SAVE4</td>
<td>2-5</td>
<td>5-15</td>
</tr>
<tr>
<td>Torrey quailbush</td>
<td>ATTO</td>
<td>---</td>
<td>50-70</td>
</tr>
<tr>
<td>Seepweed</td>
<td>SUAEED</td>
<td>---</td>
<td>2-5</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Cooper wolfberry</td>
<td>LVC02</td>
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Range site number

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Potential production (lb/acre):

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<th>Favorable years</th>
<th>Normal years</th>
<th>Unfavorable years</th>
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<tr>
<td>450</td>
<td>300</td>
<td>150</td>
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<tr>
<td>600</td>
<td>400</td>
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<tr>
<td>200</td>
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</table>
### 1450--Alley-Snowmore-Rock outcrop association

(The letter "\( t \)" means trace. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tr>
<td>Bluebunch wheatgrass</td>
<td>AGSF</td>
<td>5-10</td>
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<tr>
<td>Bluegrass</td>
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<td>---</td>
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</tr>
<tr>
<td>Basin wildrye</td>
<td>ELGI2</td>
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</tr>
<tr>
<td>Idaho fescue</td>
<td>FEID</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Nevada bluegrass</td>
<td>PONE3</td>
<td>---</td>
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</tr>
<tr>
<td>Mat muhly</td>
<td>MUR1</td>
<td>---</td>
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</tr>
<tr>
<td>Sedge</td>
<td>CAREX</td>
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<tr>
<td>Balsamroot</td>
<td>BALS1</td>
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<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>2-4</td>
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<tr>
<td>Arrowleaf balsamroot</td>
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<tr>
<td>Downy rabbitbrush</td>
<td>CHVP</td>
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<td>Spiny hopsage</td>
<td>GRSP</td>
<td>2-5</td>
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<tr>
<td>Mountain big sagebrush</td>
<td>ARVA2</td>
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<tr>
<td>Basin big sagebrush</td>
<td>ARTRT</td>
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<tr>
<td>Rubber rabbitbrush</td>
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<td>Other shrubs</td>
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<td>Potential production (lb/acre):</td>
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<td>1,400</td>
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<td>---</td>
<td>500</td>
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<td>1,200</td>
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</table>
1480--Tusel-Layview-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tr>
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<td>FEID</td>
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<td>25-50</td>
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<td>15-30</td>
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</tr>
<tr>
<td>Webber ricegrass</td>
<td>STWE</td>
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</tr>
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<td>SIHY</td>
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<tr>
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</tr>
<tr>
<td>Pine bluegrass</td>
<td>POSC</td>
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</tr>
<tr>
<td>Basin wildrye</td>
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</tr>
<tr>
<td>Nevada bluegrass</td>
<td>PONE3</td>
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<tr>
<td>Mat muly</td>
<td>MURI</td>
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<td>Groundsel</td>
<td>SENEc</td>
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<td>Balsamroot</td>
<td>BALSa</td>
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</tr>
<tr>
<td>Goldenweed</td>
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<td>Phlox</td>
<td>PHLOX</td>
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<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
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</tr>
<tr>
<td>Lupine</td>
<td>LUP1N</td>
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<tr>
<td>Other perennial forbs</td>
<td>PFFF</td>
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</tr>
<tr>
<td>Serviceberry</td>
<td>AMELA</td>
<td>5-10</td>
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Range site number

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<th>O24X021N</th>
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### 1490--Xine-Mulhop-Puffer association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
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<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<th>Inclusion number--</th>
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<td>10-15</td>
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<tr>
<td>Desert needlegrass</td>
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<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
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<td>Bluegrass</td>
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<td>Cusick bluegrass</td>
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<tr>
<td>Sedge</td>
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</tr>
<tr>
<td>Mat muhly</td>
<td>MURI</td>
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<tr>
<td>Other perennial grasses</td>
<td>PPYG</td>
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<tr>
<td>Arrowleaf balsamroot</td>
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<tr>
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<td>Other perennial forbs</td>
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<tr>
<td>Rubber rabbitbrush</td>
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<tr>
<td>Other shrubs</td>
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<tr>
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Range site number: 024X021N 027X075N 024X03ON None 027X075N 024X046N 025X003N

Potential production (lb/acre):
- Favorable years: 1,400 500 500 --- 500 1,100 2,500
- Normal years: 1,000 400 350 --- 400 900 1,900
- Unfavorable years: 700 300 250 --- 300 600 1,200
1500--Cortez very fine sandy loam, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tr>
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<tr>
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<tr>
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<tr>
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<td>15-20</td>
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<td>CHVIP</td>
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<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>2-5</td>
</tr>
<tr>
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<tr>
<td>Rubber rabbitbrush</td>
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<tr>
<td>Other shrubs</td>
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</tr>
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</table>

| Range site number       | 024X005N     | 024X005N  | 024X005N         | 025X003N               |
| Potential production (lb/acre):                          |
| Favorable years       | 800          | 800       | 800              | 2,500                  |
| Normal years          | 600          | 600       | 600              | 1,900                  |
| Unfavorable years     | 400          | 400       | 400              | 1,200                  |
1501--Cortez-Tenabo-Beoska association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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Range site number

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**1510—Locane-Rock outcrop association**

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
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<tr>
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<td>Other shrubs</td>
<td>SSSS</td>
<td>X</td>
<td>---</td>
<td>---</td>
<td>X</td>
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</tr>
<tr>
<td>Singleleaf pinyon</td>
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<td>---</td>
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<td>X</td>
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<tr>
<td>Utah juniper</td>
<td>JUOS</td>
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**Range site number**: 024X049N  None  024X026N  024X049N  025X003N

**Potential production (lb/acre):**

- **Favorable years**: 500 400 500 2,500
- **Normal years**: 350 300 350 1,900
- **Unfavorable years**: 200 200 200 1,200
### 1530—Polum-Dekoom-Polum Variant association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
<tr>
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<td>Polum</td>
<td>Dekoom</td>
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<tr>
<td>Mountain brome</td>
<td>BRCA5</td>
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<tr>
<td>Slender wheatgrass</td>
<td>AGTR</td>
<td>10-15</td>
<td>---</td>
</tr>
<tr>
<td>Idaho fescue</td>
<td>FEID</td>
<td>5-15</td>
<td>25-50</td>
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<tr>
<td>Bluebunch wheatgrass</td>
<td>AGSP</td>
<td>5-10</td>
<td>15-30</td>
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<td>Bulbsingon grass</td>
<td>MEBU</td>
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<tr>
<td>Nevada bluegrass</td>
<td>PONE3</td>
<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Thurber needlegrass</td>
<td>STTH2</td>
<td>2-10</td>
<td>---</td>
</tr>
<tr>
<td>Webber ricegrass</td>
<td>STWE</td>
<td>---</td>
<td>5-10</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>---</td>
<td>5-10</td>
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<tr>
<td>Cusick bluegrass</td>
<td>POCU3</td>
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<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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</tr>
<tr>
<td>Pine bluegrass</td>
<td>POCG</td>
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<tr>
<td>Letterman needlegrass</td>
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<tr>
<td>Basin wildrye</td>
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<tr>
<td>Geranium</td>
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<td>Groundsel</td>
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<tr>
<td>Lupine</td>
<td>LUPIN</td>
<td>2-5</td>
<td>---</td>
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<tr>
<td>Balsamroot</td>
<td>BALSA</td>
<td>2-5</td>
<td>---</td>
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<tr>
<td>Goldenweed</td>
<td>HAPLO2</td>
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<tr>
<td>Phlox</td>
<td>PHLOX</td>
<td>---</td>
<td>2-5</td>
</tr>
<tr>
<td>Other perennial forbs</td>
<td>PFFF</td>
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<tr>
<td>Serviceberry</td>
<td>AMEIA</td>
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<td>Mountain big sagebrush</td>
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<td>Snowberry</td>
<td>SYMPH</td>
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<td>Low sagebrush</td>
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<td>Douglas rabbitbrush</td>
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<tr>
<td>Oceanspray</td>
<td>HOLOD</td>
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<tr>
<td>Current</td>
<td>RIBBE</td>
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<tr>
<td>Other shrubs</td>
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Range site number

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<th>024X016N</th>
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<td>Favorable years</td>
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<td>1,200</td>
<td>350</td>
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<tr>
<td>Normal years</td>
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<td>800</td>
<td>250</td>
<td>---</td>
<td>1,300</td>
</tr>
<tr>
<td>Unfavorable years</td>
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<td>150</td>
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<td>800</td>
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## 1540--Dewar-Tenabo-Beoska association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<tbody>
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<td>Soil name</td>
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<td>Bluebunch wheatgrass</td>
<td>AGSP</td>
<td>Tenabo</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SINH</td>
<td>Beoska</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORNY</td>
<td></td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td></td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
<td></td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELCI2</td>
<td></td>
</tr>
<tr>
<td>Nevada bluegrass</td>
<td>PONE3</td>
<td></td>
</tr>
<tr>
<td>Mat muhly</td>
<td>MURI</td>
<td></td>
</tr>
<tr>
<td>Sedge</td>
<td>CAREX</td>
<td></td>
</tr>
<tr>
<td>Balsamroot</td>
<td>BALSA</td>
<td></td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td></td>
</tr>
<tr>
<td>Other perennial forbs</td>
<td>PPPF</td>
<td></td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTPW</td>
<td></td>
</tr>
<tr>
<td>Downy rabbitbrush</td>
<td>CHVIP</td>
<td></td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td></td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td></td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td></td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULA5</td>
<td></td>
</tr>
<tr>
<td>Basin big sagebrush</td>
<td>ARTRT</td>
<td></td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td></td>
</tr>
<tr>
<td>Other shrubs</td>
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Range site number:

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<tr>
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<td>700</td>
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<td>2,500</td>
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<td>Normal years</td>
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<td>600</td>
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<td>1,900</td>
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<tr>
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<td>400</td>
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</table>
## 1550--Eastwell-Shabliss-Blackhawk association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<tbody>
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<td></td>
<td></td>
<td>Eastwell</td>
<td>Shabliss</td>
<td>Blackhawk</td>
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<td>Indian ricegrass</td>
<td>ORHY</td>
<td>10-15</td>
<td>5-15</td>
<td>2-5</td>
</tr>
<tr>
<td>Thubner needlegrass</td>
<td>STTH2</td>
<td>10-15</td>
<td>10-20</td>
<td>---</td>
</tr>
<tr>
<td>Bluegrass</td>
<td>POA++</td>
<td>2-10</td>
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</tr>
<tr>
<td>Bottlebrush squirreltail</td>
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</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>---</td>
<td>2-10</td>
<td>1-3</td>
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<tr>
<td>Desert needlegrass</td>
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<td>2-10</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELC12</td>
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<td>---</td>
<td>50-60</td>
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<tr>
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<td>---</td>
<td>5-15</td>
</tr>
<tr>
<td>Mat muhly</td>
<td>MURI</td>
<td>---</td>
<td>---</td>
<td>2-10</td>
</tr>
<tr>
<td>Sedge</td>
<td>CAREX</td>
<td>---</td>
<td>---</td>
<td>1-5</td>
</tr>
<tr>
<td>Webber ricegrass</td>
<td>STWE</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Pine bluegrass</td>
<td>POSC</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>STCO4</td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PPGG</td>
<td>5-20</td>
<td>---</td>
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</tr>
<tr>
<td>Globemallow</td>
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<td>1-2</td>
<td>---</td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>---</td>
<td>1-2</td>
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</tr>
<tr>
<td>Phlox</td>
<td>PHLOX</td>
<td>---</td>
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<tr>
<td>Ericognum</td>
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<tr>
<td>Hawksbeard</td>
<td>CREPI</td>
<td>---</td>
<td>---</td>
<td>1-2</td>
</tr>
<tr>
<td>Other perennial forbs</td>
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<td>2-8</td>
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<tr>
<td>Black sagebrush</td>
<td>ARABN</td>
<td>25-35</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Wyoming big sagebrush</td>
<td>ARTBW</td>
<td>30-35</td>
<td>---</td>
<td>10-25</td>
</tr>
<tr>
<td>Spiny hopsage</td>
<td>GRSP</td>
<td>---</td>
<td>5-15</td>
<td>5-15</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>---</td>
<td>30-50</td>
<td>10-25</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
<td>---</td>
<td>15-30</td>
<td>2-5</td>
</tr>
<tr>
<td>Basin big sagebrush</td>
<td>ARTBT</td>
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<td>---</td>
<td>10-15</td>
</tr>
<tr>
<td>Rubber rabbitbrush</td>
<td>CHNA2</td>
<td>---</td>
<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Downy rabbitbrush</td>
<td>CHV1P</td>
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<td>2-5</td>
<td>---</td>
</tr>
<tr>
<td>Winterfat</td>
<td>EULAS</td>
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<tr>
<td>Other shrubs</td>
<td>SSSS</td>
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Range site number

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<tr>
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<td>700</td>
<td>250</td>
<td>2,500</td>
<td>400</td>
<td>700</td>
</tr>
<tr>
<td>Normal years</td>
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<td>450</td>
<td>150</td>
<td>1,900</td>
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<td>75</td>
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### Soil Survey

#### 1551-Eastwell, moderately steep-Shabliss-Eastwell association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Soil name</td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
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<tr>
<td>Thurber needlegrass</td>
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<td>10-15</td>
</tr>
<tr>
<td>Bluegrass</td>
<td>POA++</td>
<td>2-10</td>
</tr>
<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>---</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>---</td>
</tr>
<tr>
<td>Bluebunch wheatgrass</td>
<td>AGSP</td>
<td>---</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>ELC12</td>
<td>---</td>
</tr>
<tr>
<td>Nevada bluegrass</td>
<td>PONE3</td>
<td>---</td>
</tr>
<tr>
<td>Mat muhly</td>
<td>MURI</td>
<td>---</td>
</tr>
<tr>
<td>Sedge</td>
<td>CAREX</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PFGG</td>
<td>5-20</td>
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<table>
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<th>O24X02ON</th>
<th>O24X03ON</th>
<th>O24X00SN</th>
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<td></td>
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<td>700</td>
<td>500</td>
<td>800</td>
<td>2,500</td>
</tr>
<tr>
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<td>450</td>
<td>350</td>
<td>600</td>
<td>1,900</td>
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<tr>
<td>Unfavorable years</td>
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</table>
### 1560--Denay-Wereld-Xine association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
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<tr>
<td>Mountain brome</td>
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<td>2-15</td>
</tr>
<tr>
<td>Thumber needlegrass</td>
<td>STH2</td>
<td>2-5</td>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
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<tr>
<td>Idaho fescue</td>
<td>FEID</td>
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</tr>
<tr>
<td>Cusick bluegrass</td>
<td>POCU3</td>
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</tr>
<tr>
<td>Desert needlegrass</td>
<td>STSP3</td>
<td>---</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
<td>---</td>
</tr>
<tr>
<td>Bluegrass</td>
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</tr>
<tr>
<td>Webber ricegrass</td>
<td>STWE</td>
<td>---</td>
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1570--Pocker Variant loam, wet

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number          | 025X001N | 028B025N | 024X022N | 027X022N | 024X015N

Potential production (lb/acre):
Favorable years          | 3,000 | 1,700 | 800 | 400 | 1,500
Normal years             | 2,500 | 1,300 | 600 | 200 | 1,200
Unfavorable years        | 1,800 | 900  | 350 | 50  | 800
1640--Isolde-Parran-Appian association
(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number: 027X016N 027X025N 027X024N None 027X025N 027X009N 027X028N

Potential production (lb/acre):
Favorable years: 300 400 600 --- 400 800 700
Normal years: 200 200 400 --- 200 450 500
Unfavorable years: 50 50 200 --- 50 200 300
1650--Bango-Appian association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
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1660—Biddleman-Trocken-Biddleman, stony, association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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Range site number

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Potential production (lb/acre):

Favorable years: 400
Normal years: 200
Unfavorable years: 50
3000--Jobpeak-Teguro-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Soil name</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Inclusion number--</th>
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<td>Other perennial grasses</td>
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<td>X</td>
<td>X</td>
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<tr>
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<td>Arrowleaf balsamroot</td>
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<tr>
<td>Other perennial forbs</td>
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<tr>
<td>Mountain big sagebrush</td>
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</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>---</td>
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</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVEB</td>
<td>---</td>
<td>---</td>
<td>5-15</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
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</tr>
<tr>
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<td>Other shrubs</td>
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</tr>
<tr>
<td>Singleleaf pinyon</td>
<td>PIMO</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Utah juniper</td>
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</table>

Range site number: 024X049N 024X049N None 027X027N 027X058N 024X049N

Potential production (lb/acre):

- Favorable years: 500 500 --- 200 1,200 500
- Normal years: 350 350 --- 100 1,000 350
- Unfavorable years: 200 200 --- 50 800 200
### 3010—Bedwyry-Bedgazz-Jobpeak association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community.)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
</tr>
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<td></td>
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<td>Soil name</td>
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<tr>
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<tr>
<td>Bluegrass</td>
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</tr>
<tr>
<td>Thurber needlegrass</td>
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</tr>
<tr>
<td>Sandberg bluegrass</td>
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<tr>
<td>Bluebunch wheatgrass</td>
<td>AGSP</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial grasses</td>
<td>PGG</td>
<td>5-15</td>
</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>---</td>
</tr>
<tr>
<td>Arrowleaf balsamroot</td>
<td>BASA3</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial forbs</td>
<td>PFF</td>
<td>2-5</td>
</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>20-30</td>
</tr>
<tr>
<td>Bud sagebrush</td>
<td>ARSP5</td>
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<tr>
<td>Sagebrush</td>
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<tr>
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<tr>
<td>Other shrubs</td>
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</tr>
<tr>
<td>Singleleaf pinyon</td>
<td>PIMO</td>
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</tr>
<tr>
<td>Utah juniper</td>
<td>JUOS</td>
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Range site number:
- 027X028N
- 027X020N
- 024X049N
- 027X020N
- None

Potential production (lb/acre):
- Favorable years: 700 400 500 400
- Normal years: 500 200 350 200
- Unfavorable years: 300 100 200 100

None
3020--Uripnes-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
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<td>Rock outcrop</td>
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<tr>
<td>Indian ricegrass</td>
<td>ORHY</td>
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<td>---</td>
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</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
<td>2-5</td>
<td>---</td>
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<tr>
<td>Bottlebrush squirreltail</td>
<td>SIHY</td>
<td>2-5</td>
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</tr>
<tr>
<td>Bluebunch wheatgrass</td>
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<tr>
<td>Thurber needlegrass</td>
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<tr>
<td>Bluegrass</td>
<td>PQA++</td>
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<td>POSC</td>
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<td>20-30</td>
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<tr>
<td>Basin wildrye</td>
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<td>Other perennial grasses</td>
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<tr>
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<tr>
<td>Arrowleaf balsamroot</td>
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<td>Other perennial forbs</td>
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<td>Wyoming big sagebrush</td>
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<td>5-15</td>
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<tr>
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<td>Basin big sagebrush</td>
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<td>Rabbitbrush</td>
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<tr>
<td>Singleleaf pinyon</td>
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<tr>
<td>Utah juniper</td>
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</tbody>
</table>

Range site number: 027X017N  None  024X049N  027X007N  027X029N

Potential production (lb/acre):

Favorable years  400  ---  500  600  800
Normal years  200  ---  350  450  500
Unfavorable years  100  ---  200  300  100
3030--Singatse, very steep-Rock outcrop-Singatse association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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<td></td>
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<td>Thurber needlegrass</td>
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<tr>
<td>Galatea</td>
<td>HJZA</td>
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<tr>
<td>Pine bluegrass</td>
<td>POSC</td>
<td>---</td>
</tr>
<tr>
<td>Sandberg bluegrass</td>
<td>POSE</td>
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</tr>
<tr>
<td>Other perennial grasses</td>
<td>PFFG</td>
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</tr>
<tr>
<td>Tapertip hawksbeard</td>
<td>CRAC2</td>
<td>---</td>
</tr>
<tr>
<td>Arrowleaf balsamroot</td>
<td>BASA3</td>
<td>---</td>
</tr>
<tr>
<td>Other perennial forbs</td>
<td>PFFF</td>
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</tr>
<tr>
<td>Shadscale</td>
<td>ATCO</td>
<td>10-20</td>
</tr>
<tr>
<td>Bailey greasewood</td>
<td>SAVB</td>
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<tr>
<td>Bud sagebrush</td>
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<td>EPNE</td>
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<td>Winterfat</td>
<td>EULA5</td>
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<td>Littleleaf horsebrush</td>
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<td>Rubber rabbitbrush</td>
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<tr>
<td>Other shrubs</td>
<td>SSSS</td>
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</tr>
<tr>
<td>Singleleaf pinyon</td>
<td>PIMO</td>
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</tr>
<tr>
<td>Utah juniper</td>
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Range site number

<table>
<thead>
<tr>
<th>Potential production (lb/acre):</th>
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<tbody>
<tr>
<td>Favorable years</td>
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<tr>
<td>Normal years</td>
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<tr>
<td>Unfavorable years</td>
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Potential site number

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### 3031--Singatse-Jobpeak-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

<table>
<thead>
<tr>
<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
<th>Soil name</th>
<th>Inclusion number--</th>
</tr>
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<tbody>
<tr>
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<td>Singatse</td>
<td>Jobpeak</td>
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<tr>
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<tr>
<td>Sandberg bluegrass</td>
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<tr>
<td>Other perennial grasses</td>
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<td>X</td>
</tr>
<tr>
<td>Tapertip hawks beard</td>
<td>CRAC2</td>
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<td>---</td>
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<tr>
<td>Arrowleaf balsamroot</td>
<td>BASA3</td>
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</tr>
<tr>
<td>Other perennial forbs</td>
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<td>Shadscale</td>
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<tr>
<td>Bailey greasewood</td>
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<tr>
<td>Other shrubs</td>
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<td>5-10</td>
<td>X</td>
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<tr>
<td>Singleleaf pinyon</td>
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</tr>
<tr>
<td>Utah juniper</td>
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Range site number

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<th>O27X020N</th>
<th>O27X017N</th>
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Potential production (lb/acre):

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### 3040—Madaline-Millerlux association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<tr>
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**Range site number**

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<th>024X016N</th>
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3050--Millerlux-Ninemile-Madeline association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

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<th>Common plant name</th>
<th>Plant symbol</th>
<th>Percentage composition and production (dry weight) of plants on major soils and inclusions</th>
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